Managing the Known and Unknown in Mobile Workforce Management

Backlog Management and Capacity Planning in Service Organizations

Balancing Customer Satisfaction & Efficiency ■ Enabling Continuous Improvement & Differentiation

Introduction

This white paper discusses planning for the mid-term and long-term as it relates to mobile workforce management.

You've planned for today's workload. But what about tomorrow, next week, or even next year? How much work will you be doing by type, region, and service level? How can you manage the backlog of work that rolls from day-to-day? And what actions can you take to improve your operations?

Planning is a critical link to productivity in your business processes. Get it wrong and you lose ground to the competition. Get it right and your service organization can optimize your response, while meeting budget and customer expectations.

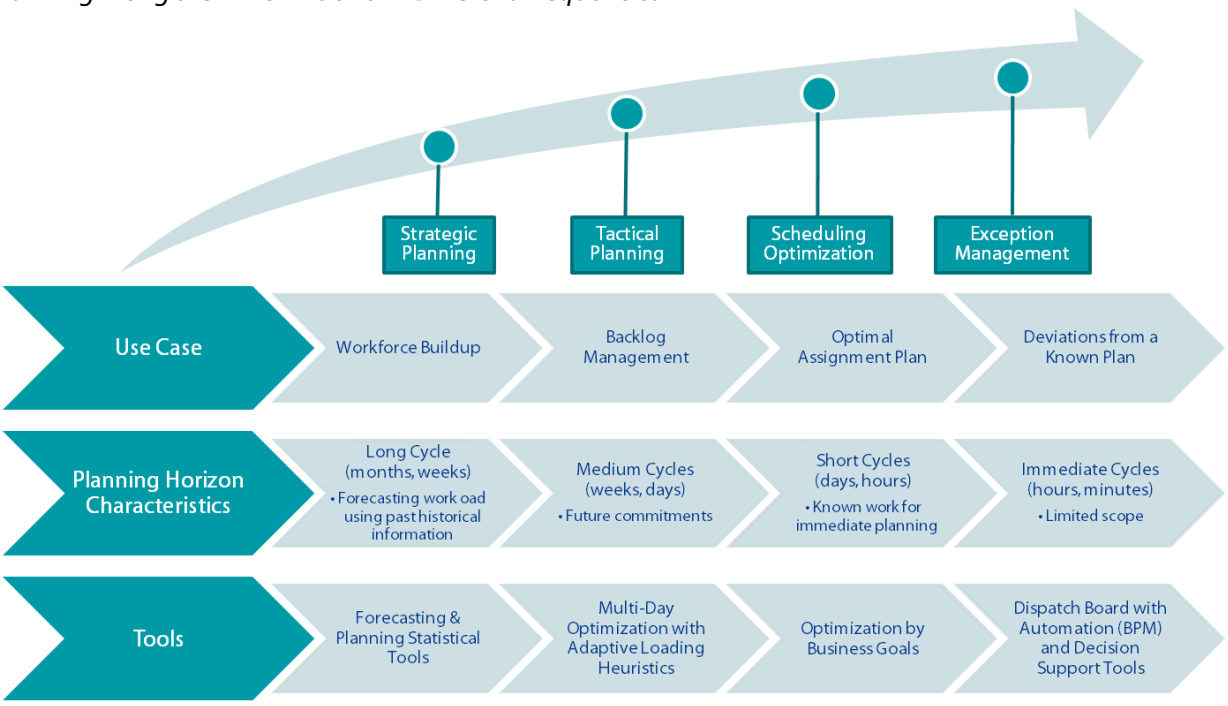
ViryaNet G4 – integrated with our Performance Management practice – helps you get it right by providing all levels of work and resource planning – from long-term strategic planning to short-term tactical adjustments to daily optimization – so you can manage the known and unknown in your field service organization.

The Planning Spectrum

Planning is an ongoing, continuous decision-making effort. Different activities – requiring several technologies – need to be handled along the time axis and in different frequencies.

Planning is not just the daily optimization or the optimization for the next day's schedule. Whether your service organization handles break-fixes, planned maintenance, or long-term projects, you're managing activities across the planning spectrum.

Planning Along the Time Axis and in Different Frequencies



The Planning Spectrum starts with strategic planning where questions concerning workforce planning (e.g., the number of needed technicians, their respective geographical locations and skill sets) are answered, using predictive analytics technology. Strategic planning is the big picture – your long-term goals and objectives.

Tactical planning is where the work backlog is managed, using business process and rules technology to assure that long-term work commitments are optimally spread along the year. Tactical planning is focused on your short-term goals. Tactical planning is a more granular process where you're scheduling for known work.

Next, Scheduling Optimization is where artificial intelligence is used to create optimal assignments plans and answer the questions "who should do what, when, where and with what". Optimization looks at planning in the most granular way, considering time windows, constraints, skills, dependencies, etc.

Then, there's the reality of managing a mobile workforce – and the inevitable need to manage exceptions – by applying various continuous optimization techniques for ongoing optimization.

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Managing the Known and Unknown

Looking into the future can mean different things to different people. Future planning is a collection of business questions that you can ask. By segmenting your use cases, you can set a path towards the solution.

Future Planning – Segmentation of Business Questions / Use Cases

To understand the problem you're trying to solve, it's best to group the business questions, based on how much you know and if the questions are related more to the work or to the workforce.

For example, an assignment-related question about planning for the future might be "when is a preventive maintenance work order likely to be scheduled?" The use case is you need to know 2 weeks in advance (not necessarily the exact date) because a permission request process must be initiated prior to the preventive maintenance work.

This use case is referring to a work item that is known, but you could also ask assignment-related questions regarding work items that are not known yet. For example, what is the expected future workload? Or what will be the impact of this workload on a service level agreement that I could offer to my customers (i.e., expected time-to-resolution or time-to-install)?

There is a different set of use cases for questions regarding the workforce, for example:

- How many people do you need?
- What are their skill sets?
- Where should they be located?
- What should be your overtime policies?

Some information will be available to you in advance; other information will not. In addition, the timeframes could change. You may ask yourself about the "unknown" for tomorrow (e.g., the break-fix workload for each day because of strict service level agreements (SLAs)) or the next quarter.

Answering workforce-related questions could be based on workload information that is unknown. For example, when asking "Do we have enough resources to complete the expected work for the next month?", you need to forecast the workload before trying to come up with an answer. In contrast, asking the same question could mean: "Do we have enough resources to complete a known backlog of commitments that was already taken for the next month?" In this case, forecasting the workload is not needed, but you need the ability to accurately plan for the long term.

In some cases, you can simplify the problem by creating two different workforces: one for maintenance (dealing with longer-term commitments) and one for break-fix (dealing with workload that needs to be forecasted). But have you really solved the problem? Or do you have an inefficient workforce? Perhaps, you should re-consider separate workforces for different types of work. By breaking the silos of maintenance vs. break-fix, you can remove artificial boundaries and optimize your operations by doing more work with fewer resources.

It is important to understand the use cases that are relevant to you and the ability to combine the known and the unknown – both for the short-term planning and the long-term planning. If you want to meet your business goals – whether those goals are focused on effective use of resources, better service, or a balance between the two – this understanding is key.

Long- and Short-Term Planning – Framework for a Complete Solution

To answer your business questions, you need to utilize several tools together as part of a framework.

When thinking about specific assignments and specific work orders – known work – you need a tool like an optimization engine to generate a specific assignment plan.

When thinking about unknown work you need a strategic planning tool in order to forecast your work and build an average profile of your workforce to analyze supply vs. demand.

To support these various use cases, you need to integrate these two tools. Then, when you focus on the known work (creating an assignment plan for tomorrow), you can take into consideration the unexpected work that will have to be completed tomorrow, but is unknown at the time of creating the initial plan. And when planning for the long term (comparing supply vs. forecasted demand), you need to know the long-term commitments that were already made.

You may be confused about where to start the planning process. Do you start with your "known" work? Or do you start with the things that you don't know? In addition, you may hope to combine your "known" and "unknown" work for a longer-term – and more accurate – planning process.

The strategic planning process is recommended to focus on the "unknown". In strategic planning, you'll look at your history. And based on your history, you'll use statistical methods to forecast your workload. Even your "unknown" is not completely unknown.

Your statistical models can be quite sophisticated. You can analyze seasonal effects. You can remove outliers, for example, a peak last November that you know isn't representative of your workload. Based on this analysis, you can forecast what is unknown. Once you have this information and combine it with the historical average of how much work your workforce can do, you can plan for how many people you would need in the future.

Let's say, on average, you know each of your resources works 8 hours a day, plus 2 overtime hours a week. You can create a profile of your workforce: how much time is spent on break-fix, maintenance, on-site, travel, etc. With all these statistics, you can have an accurate planning process, knowing whether you have enough resources to meet future demand.

This strategic planning process focuses on the history and not the known work. You can make this process even more sophisticated by adding the commitments that you already know about to the forecasted work. But adding the known work is not as accurate a process as building schedules. Because when you add the known work, you have to include how much of this known work you'll do this week, next week, and the week after. So you're already making some planning assumptions. However, the strategic planning process is worthwhile for planning long-term and planning for the unknown, as long as you understand that your focus is on what is unknown.

The tactical planning process focuses on planning for the known. When you actually build a concrete plan, running an optimization – as part of tactical planning – is a more accurate process. Based on your business objectives, you optimally assign every work order to a resource.

Optimization is a sophisticated process. You need to think about commitments you need to finish in the next month. How do you decide what to do first? What to do next? Depending on your service organization, it may make sense to collect all the work in a certain zone together – aggregating the work in a certain neighborhood on certain days of the month – so your workforce isn't traveling across town. The ViryaNet G4 Optimizer reviews intuitive clusters (e.g., high/low priority in a certain zone; work that is close to a technician's home location). Based on those decisions, the Optimizer tries to distribute the workload in a logical way, based on 2 main criteria:

- The priority of the work throughout the month
- The proximity of this work to other work items

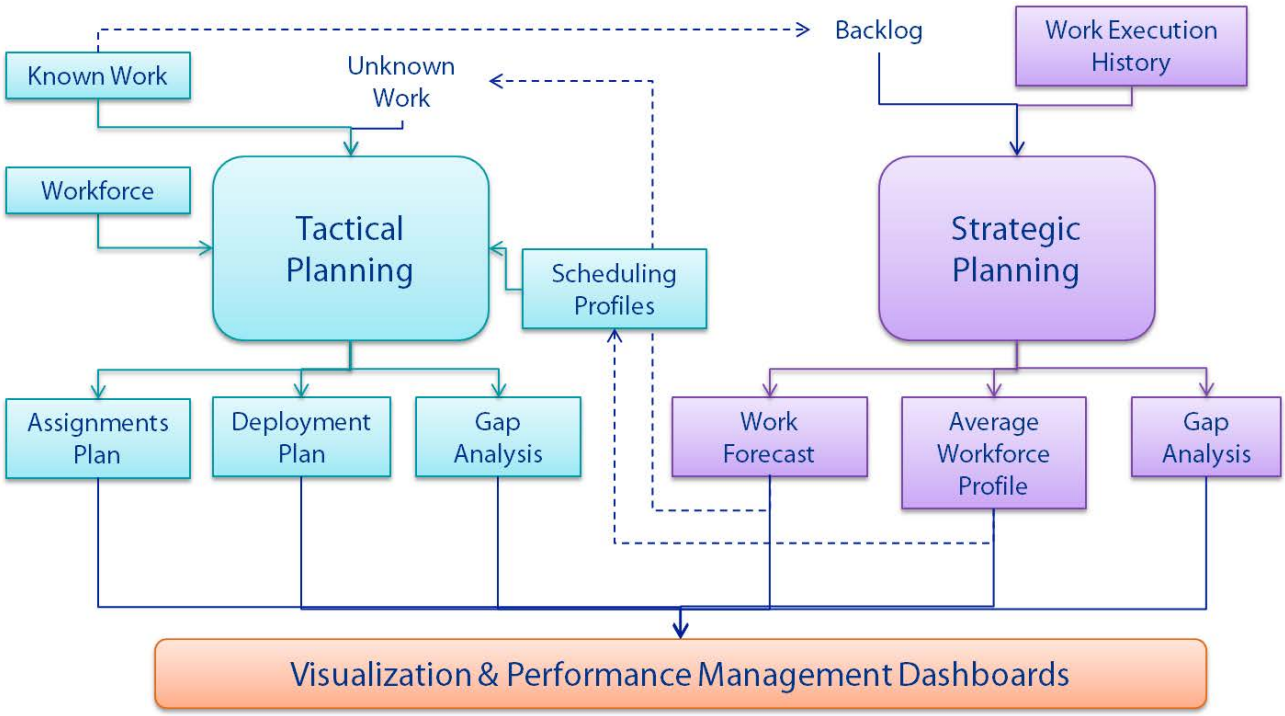
By focusing on priority and proximity, the workload can be distributed appropriately.

Optimization is an important element of tactical planning. When you run the schedule for the known work, you can limit the capacity of your resources for the unknown work (e.g., break-fix). You're planning for the known and saving capacity for the unknown.

Tactical planning goes hand-in-hand with strategic planning. You may assume that you're dividing the work 50/50 between break-fix (that is mostly not known at the time of creating the plan) and known work. But your assumption isn't based on any forecast or detailed analysis of your data.

However, let's say you've conducted forecasting and you know that for certain individuals, break-fixes consume 50% of their time. For others, break-fixes consume 40% of their time. In other regions, break-fixes may consume only 30% of their time. You can use this information in your tactical planning process. Based on this forecast, you can run the schedule for the known work with the assumption that you can use any "extra" capacity (the capacity you previously limited) for the unknown work. Now, your forecast is based on much more accurate data than just making assumptions.

When utilizing and integrating both the optimization engine for next day or multi-day use, (i.e., tactical planning) and the strategic planning tool, you will be empowered to answer the range of business questions you have along The Planning Spectrum.



Using Performance Management to Provide Better Visibility

Performance management is a process to define your goals, identify the respective business questions and the related KPIs, measuring and analyzing, making and acting on informed business decisions, and measuring again. Your corrective actions may include tweaking the configuration of your software or altering some of your business processes.

Developing and practicing continuous performance management helps you analyze your business questions, and is crucial to monitoring progress towards your business objectives (which may change with time) and enables continuous improvement towards achieving your goals.

The ViryaNet Performance Management Framework promotes a balanced view of your business, elevates your ability to make informed executive decisions, and leverages the business value of your mobile workforce management solution by offering:

- a wide out-of-the-box package of KPIs for best-in-class mobile workforce management and field service organizations
- a tailored Performance Management Framework with an accompanying consulting service to establish or enhance a Performance Management practice
- a set of charts, reports and interactive goal-driven dashboards for data visualization, providing a balanced view
- systematic data gathering and accumulation featuring a star schema database design data integrity measures and scores

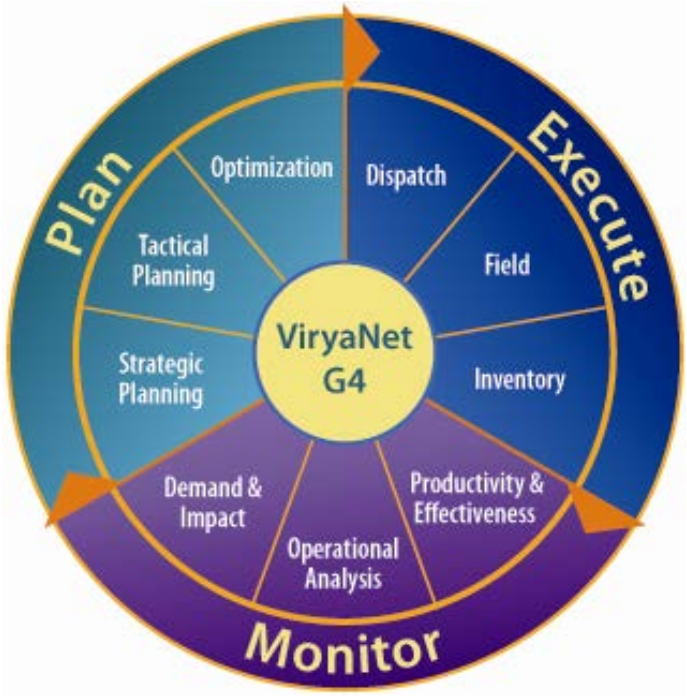
Summary and Recommendations

- Focus on the business questions that you are trying to resolve (assignment-related or workforce-related) and what is known or unknown at the time of answering those questions.
- Plan along The Planning Spectrum (from sizing the workforce through daily optimization to managing exceptions).
- Optimize your daily plans. (Otherwise, you don't really know how much you can do. But once you optimize your daily plans, you can determine if your assumptions are right and if you have the right resources).
- Integrate your long-term planning processes with your short-term and mid-term planning processes. Feeding information from one to the other will improve both.
- Develop and practice continuous performance management which helps you analyze your business questions, and is crucial to monitoring progress towards your business objectives (which may change with time) and enables continuous improvement towards achieving your goals.

Planning and ViryaNet G4

With ViryaNet G4, you have the ability to plan, execute and monitor long-term trends and short-term, dynamic events to continuously achieve operational goals.

The ViryaNet G4 Planning Module lets you get it right by providing for all levels of planning your work and resources – from simple to complex work – from individual resources to your multi-skilled, multi-person crew assignments-for long-term strategic planning and short-term tactical adjustments.



Strategic Planning provides strategic forecasting of demand (work) and the planning of resources (people, tools, vehicle, etc.), based on historical trends and projected future activities.

Tactical Planning provides tactical forecasting of work or tasks, based on partially completed or known, but not yet scheduled activities.

Optimization contains a sophisticated set of heuristic algorithms and next-generation, multi-objective optimization functions, and utilizes the latest geospatial technology, to optimize the allocation of all work – simple and complex – across your enterprise.

How are you managing the known and unknown?

Find out how ViryaNet can help.

About ViryaNet

ViryaNet delivers mobile workforce management solutions that intelligently guide, automate, and optimize both simple and complex field service work, resulting in measurable business benefits. ViryaNet's products, pre-packaged solutions and people are recognized within the industry as innovative which in turn enables its' customers to be viewed as leaders within their respective industries. ViryaNet's G4 products specialize in the functions of scheduling and dispatching resources and enabling mobile field communication and are delivered in industry specific configurations. Embedding industry best practices and utilizing innovative technologies like ViryaNet's BPM Blueprint for Mobile Workforce Management™, Microsoft InfoPath® and device agnostic mobile solutions enable ViryaNet's products to be rapidly deployed and extended to support virtually any business process across a wide range of industries. ViryaNet is proud to call many of the world's leading utilities, the United States' largest pure rural telecommunications firm, the supermarkets most respected retailer, and North America's largest auto insurer as customers. ViryaNet has strong partnerships with leading platform and system integration companies that enable it to have a global presence. Headquartered in Westborough, MA, ViryaNet has additional offices in the United States and Israel. For more information visit our website or follow us on twitter.

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