

## **Next Generation WorkForce Management Systems**

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## Introduction

Today service providers face many challenges, amongst them, how to manage a mobile workforce handling installations, repairs and various service calls on increasingly complex technologies. According to a recent study by Aberdeen (*The Mobile Field Benchmark Report*, September, 2004), market pressures are adding to the need for successfully implementing WFM systems. These pressures include cost cuts that require superior worker productivity to accomplish more with less workers; the need for elite customer service which has become a differentiator amongst competitors and can provide the edge required to be considered the best-in-class; and higher customer expectations requiring faster responses by technicians in order to keep customers satisfied.

WorkForce Management Systems have evolved over the past several decades and are now crucial to keeping operations of many service industries – telecommunications, electrical, cable, etc – running effectively. This paper will identify the problems with the current WorkForce Management (WFM) Systems and will outline recommendations as to what is needed to optimally manage tomorrow's mobile workforce.

## Current WorkForce Management Systems

The traditional WorkForce Management Systems currently deployed in most Telecom, Cable and Utility companies were developed around the processes of the manual dispatch centers. These centers implemented the processes that allow for the continuous involvement of the Dispatch Center personnel in the interfering and overriding of the workforce management systems intelligent work assignments. The impact of constantly overriding and interfering with the WFM systems creates multiple problems and usually results in higher costs of operations and missed appointments. This negatively impacts key metrics such as customer satisfaction, on-time installations, productivity and mean time to repair.

## Deficiencies in Dispatch Process and Systems

There are various deficiencies in dispatch center processes and system functionality that prevent companies from meeting the optimal workforce assignment/management. These deficiencies are outlined below.

### ***Bulk Dispatch***

Bulk dispatch is traditionally used so that the managers/dispatchers can have the false expectation that all the work scheduled for today has been assigned to a technician. But can all the assigned work be completed? If so, can it be completed on time? Most important, how does one handle the shift in priorities and additional work inputs throughout the day?

### ***Manual Overrides***

Manual overrides counter-act workforce optimization and usually result in additional costs to the company. Manual overrides need to be minimized and tracked. Simply pushing the work orders out without an overall view of the impact, defeats the whole purpose of a WorkForce Management System.

### ***Workgroup Silos***

Workgroup silos are created with false boundaries; this causes one work group to miss commitments, while other work groups are possibly working on future commitments. This is partially caused by the inability of the current systems capability to manage several work centers. Rigid boundaries associated with a specific work group can cause additional travel and/or missed customer commitments.

### ***Technician's Profiles***

Technician's profiles (skills, work location, movement from one group to another, etc.) currently need to be manually updated, and very rarely are. All profile updates need to be done automatically through interfaces to a common hierarchy management facility and when necessary, the HR system(s).

### ***Job Assignments***

Assigning jobs with the same estimated hours simply by job type does not give an accurate measurement of how long the job should really take to complete, or what stage the technician is currently at for a given job. All jobs are different, work estimates can vary from 15 minutes to 3 hours. To optimize the workforce, one needs to know exactly what the technician is doing right now and make intelligent estimates when technician's job will be completed. Jobs need to be broken down by tasks (job decomposition), each task should have an estimated time for completion with proactive notification back to the WFM system on delays and completions.

### ***Forecasting***

Legacy WorkForce Management systems lack the key capabilities of Forecasting, Planning & Trend Analysis. Forecasting and Trend Analysis give the management team the capability to better Plan for the future. Forecasting and Trend Analysis provide the tools to plan for repeating events such as: weather conditions, "fall rush", historical demand, historical work decrease, etc. Such tools are available in Next Generation WFM systems. Without these tools there is not an intelligent way of scheduling appointments in the future and of determining what resources will need to be allocated to those appointments. Some of the next generation WFM systems also have "Artificial Intelligence" that will plan and modify historical events in "real time." Other systems have "What if Scenarios" that help plan for the short term and provide help in creating and evaluating scenarios that can fulfill workload commitments. Some of these scenarios include the following: What if 10 more resources were added to the dispatch pool? What if 2 hours of overtime were authorized? What if temporary help were retained for 2 months? Etc. By creating these different scenarios the Dispatch Center personnel have the ability to focus on business objectives, and develop and view different options before they execute the plan to meet these objectives.

### ***Flexibility***

The current WorkForce Management systems are very inflexible and not easily configurable. Both Main Frame and Client/Server applications are designed with the majority of functionality hard coded into the application limited to some minor modifications of tables and Technician's profiles. The demand for advanced services like "triple play", FTTP, etc. rapidly being deployed by the Telecom industry require more flexibility and end-user

configurability in WFM systems to allow companies to quickly deliver these new services to the rapidly changing market place.

### **KPIs**

The current WorkForce Management systems control the assignment of work through Job Type weighting and priority weighting. In a perfect world where all (installs & troubles) the work is consistent and the resources always are available to work the entire job, this can work. History shows us that the workload is not always consistent and there are not always enough resources to cover the work orders. Work Optimization outlined above can certainly help, but having the ability to manage KPI's dynamically can help even further. Key Performance Indicators (KPI's) are the measurements that the company has committed to meet to the senior management team, the customer and regulators. Examples would be Mean-Time-To-Repair (MTTR), Dispatch to Close, Customer Care Index (CCI), On-time Provisioning, etc. Some Next Generation WorkForce Management systems have the capability to monitor and manage the KPI's by dynamically adjusting the work assignment based on the existing business rules provided by the systems' operators. Pre-built KPI adjustments can be activated to redirect the attention of the workforce to the KPI metric that is in jeopardy of being met. Examples would be on the last week of the month if all the KPI's were on target with the exception of MTTR, the MTTR adjustment would be invoked for the last week and the highest priority for dispatch would be MTTR.

### **SLAs**

The Management of Enterprise customers in the current WorkForce Management systems are very inefficient. In most cases a Major Account Code (MAC) with very little control and knowledge of the different priorities, and/or addresses associated with the major account drives the dispatch. Next Generation WFM systems have Service Level Agreement (SLA) templates that are based on the detailed agreement for each Enterprise customer. They control the dispatch priorities for the major customer for each service type at all of the service addresses. They have the ability to page, call and/or email specific managers and technicians that are involved with the specific account.

## **Next Generation WorkForce Management Systems**

Next Generation WorkForce Management Systems have the capability to improve dispatch optimization, reduce center support personnel, consolidate centers, provide tools for interfaces and GUI's that are easily configurable, and to streamline appointment / resource management, SLA Management and Customer Proactive Management. WorkForce Management systems have traditionally managed the input of work orders (load) to the assignment of resources (force). The next generation WFM systems provide the traditional WFM features and functionality and also provide more sophisticated algorithms and functionality to help in optimizing and managing the workforce to work load. Features like dynamically rearranging the work while proactively notifying the customers and the management team of ETA's, delays and jeopardy's, give the management team more control and most of all keep the customer informed.

Next Generation WorkForce Management Systems provide the capability for the Center personnel to deal with exceptions *not* the actual dispatching of the work. Next Generation

WFM provides the capability to reduce center personnel, consolidate centers and fold down centers for late night shifts. Invoking a pre-set resource-balancing plan can handle the movement of resources between work groups and other centers to balance the workload dynamically. Work Groups and/or work orders can easily be shifted in the case of an emergency or a catastrophic event. Providing an interface to HR systems (e.g. training, vacations, or movement to another work group) and Absence Reporting systems will eliminate the need for manual updates and greatly improve the dispatch optimization.

### Key Next Generation WFM System Features & Functionality

<i>Continuous dynamic optimization – e.g. rescheduling work to react to customer cancellations, jobs completed early or late, changes in workforce resources, the volume of workload, and changes in priorities</i>	<i>Job Decomposition – decompose jobs into individual tasks providing ability to proactively reallocate the workforce as well as increased accountability</i>
<i>Cost based Optimization – e.g. optimization algorithms based on the cost of doing the job, i.e. travel, employee vs. contractor, etc.</i>	<i>Appointment scheduling and web services for customer self-appointments</i>
<i>Robust Forecasting / Planning – including a Proof of Concept methodology using real historical data</i>	<i>Project &amp; Crew Management e.g. for large jobs and CX&amp;M EWO management</i>
<i>Trend Analysis using historical data</i>	<i>Dynamic Load Balancing between work groups, centers and different types of Technicians e.g. supports “Fluid WorkForce”</i>
<i>Ad hoc Reporting Capabilities</i>	<i>Single system for all technicians, COT’s, I&amp;M, CX&amp;M and Proactive Maintenance</i>
<i>Wireless MW w/configurable workflow engine</i>	<i>Interfaces to HR systems to update Technician &amp; Team information</i>
<i>“Push Technology” for communication to and between the mobile workforce personnel</i>	<i>Integration manager allowing for building XML interfaces</i>
<i>Performance, scalability, and flexibility to manage the total workforce... I&amp;M, CX&amp;M, COTS, etc.</i>	<i>SLA Management...Manages Enterprise customers Service Level Agreements</i>
<i>User configurable screen changes to allow for flexibility of providing new services and regulatory requests.</i>	<i>Overtime Management, Equalization and Callout</i>
<i>Exception handling, not dispatching handling</i>	<i>Inventory and Equipment tracking built into dispatch algorithm</i>
<i>Pop-up alarms and alerts to center personnel, managers and technicians</i>	<i>KPI tracking and adjustments...Allows for Tracking the Key performance Indicators i.e. OOS over 24 hours, dispatch to clear, MTTR, etc. and adjust the priorities to meet specific KPI’s</i>

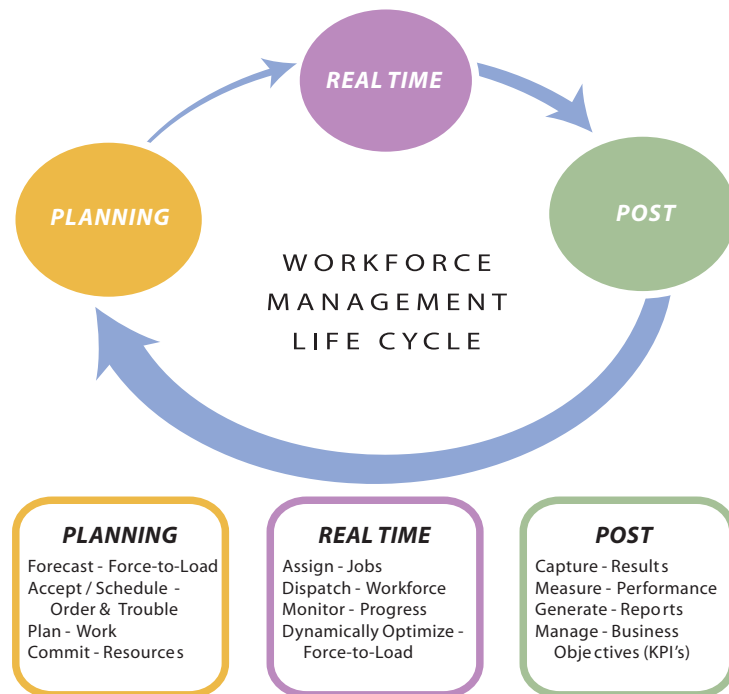
<i>VXML for VRU applications</i>	<i>Manages Separate Time Zones and several languages</i>
<i>Street Level routing Integrated with GPS based dispatch</i>	

### Optimal WFM System Recommendations

Our WFM experience and market insight affords us the ability to recommend key attributes of an Optimal Next Generation WFM System in terms of: Functional Components and Architecture.

### Optimal Lifecycle & Functional Components

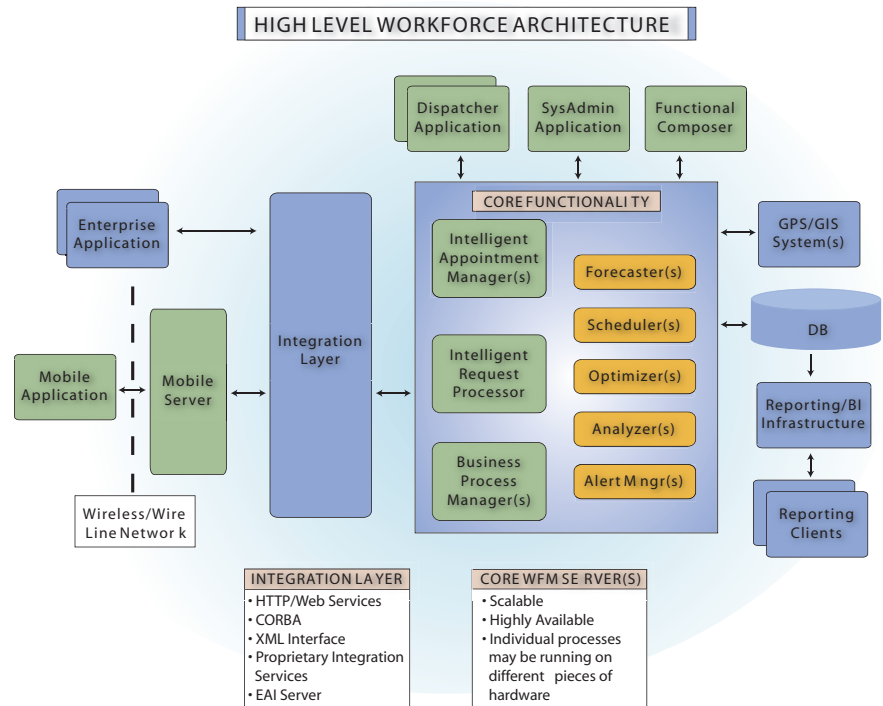
Next Generation WFM systems are comprised of functional modules supporting the dispatch lifecycle, with some of the systems covering all stages of it, and some not. The following functional steps represent the dispatch lifecycle:



## Supporting Application Modules

- Forecaster
- Order/Trouble Processor (s)
- Scheduler (s)
- Optimizer (s)
- Analyzer (s)
- Alert Manager (s)
- Functional Composer
- Business Process Manager
- Intelligent Appointment Manager (s)
  1. Center channel
  2. Mobile channel
  3. Self service channel
- Dispatcher Application (s)
- Mobile Server
- Mobile Client (s)
- Systems Administration Application

## Optimal Architecture



### ***Scalability***

The WorkForce system should be able to scale with addition of new Field WorkForce/ Dispatchers in the system. There will likely be spikes in demand as there are complex workflows communicating with different systems.

### ***Optimization Algorithms***

System should have well researched, configurable and well tested optimization algorithms. Ideally the optimization algorithms should be pluggable since optimization algorithms are a process of continuous research and refinement.

### ***Integration/Extensibility***

The WorkForce System should have open architecture for integration with existing enterprise infrastructure and mobile application workforce. Additionally, the system should be extensible to allow for integration of complex work tasks.

### ***Time Zones and Localization support***

Working seamlessly in different time zones and supporting localization for the same system to work in an international environment is crucial.

### ***GIS/GPS integration***

The dispatch system and mobile application should be able to integrate well with various GIS systems. Standard integration points should be available to integrate and display with the GPS data transmitted from the field.

### ***Audit Trail***

A multi-dimensional audit trail allows for detailed audit analysis of field force and system.

### ***Reporting/Data Mining***

Easy reporting integration - essentially giving the power of reporting to the analyst rather than relying on IT.

### ***Performance***

System should be designed with good performance features to have the dispatchers near real-time view of the field they are covering.

### ***Fail over/Crash Recovery***

System should support automatic fail over to the redundant system in case of system crashes. System should be easy to recover from crashes preferably with self-healing features.

### ***Mobile Application support***

Support for the following is necessary:

- Compression, security and guaranteed delivery
- Varying form factors and devices
- Smart Updates
- Configurable user interface definition

- Configurable validation and rules support
- Intelligent roaming/Automatic fail over to best available network
- Optimal use of Wireless Bandwidth
- Data retrieval from Mobile device for problem identification
- Integration with other equipment and other systems (e.g. bar code reader)

## Conclusion

WorkForce Management systems are vital to any successful company with a mobile workforce that is responsible for installs, troubleshooting and repairs. While initial systems were more manual in nature, next generation WFM systems will need to be more comprehensive and intuitive to be successful. According to The Mobile Field Service Benchmark Report: *Bridging the Chasm Between the Field and Back Office*, by utilizing next generation workforce solutions “service organizations stand to realize huge gains in overall service costs, equipment uptime, technician productivity, and overall profitability.”



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