



Predictive. Cloud-Based.  
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## Benefits of Operationalizing Mobile Workforce Management in the Cloud

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### A Business White Paper

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## A Business White Paper

## Introduction

Since divestiture of the Telecommunications' monopoly in 1984, Communication Service Providers (CSPs) have been transforming and reinventing themselves to be more competitive. To remain competitive they had to provide new service offerings, better pricing and improved quality of service. Operations Support Systems (OSS) were the foundation that allowed CSPs to not only offer additional services but also provided the means to optimize the efficiencies (cost reduction) and provide better, more reliable services to their customers. Increased efficiencies of operations translated to increased profits, so the CSPs have been eager to continually look for new technologies that would allow them reduce operating expenses, particularly in their wire-line businesses where growing top line revenues has become increasingly difficult.

Today the new technology platform that holds significant promise for new generation of OSS is Cloud Services. Yankee Group predicts that by 2014 there will be \$2.4 billion dollars of revenue generated by Cloud Services. As CSPs are transitioning to Cloud-Based Services, they will not only become consumers of these services, but they will become providers and/or resellers as well. Throughout this transition, OSS as well as Business Support Systems (BSS) will become the key building blocks utilized in moving towards this transformation.

This paper will focus primarily on Mobile Workforce Management (MWFM) solutions, a key OSS component in the transition to Cloud-Based Services. Since mobile workforce management interfaces with the majority of the CSP's operations, it will provide the most opportunities for "cloud" collaboration and operations optimization. Mobile workforce management solutions not only increase workers productivity, but they also have positive impact on fleet management, supply chain, contractor and customer satisfaction by improving service delivery. By having your MWFM application in the "cloud" one can now provide collaboration that will improve and streamline interactions with internal organizations, external suppliers as well as the customer.

## History of Workforce Management

Prior to the divestiture of AT&T there was little motivation for the Regional Bell Operating Companies (RBOCs) to invest in new technologies or to increase their operational efficiencies. Telecoms were guaranteed a 15% rate of return whether they improved their operations and service offerings, or kept status quo. As a result, their focus was on maintaining a high quality of service and operational efficiency was an after-thought. After divestiture in 1984, when profits were no longer guaranteed and competition (MSOs, CLECs and others) became a reality, the Telecoms not only started offering newer technologies (i.e. ISDN), but they also started to look at ways of improving their operational efficiencies and to become more competitive.

In the area of workforce management, the concept of centralized dispatch was introduced to create flexibility across work groups and to provide a better focus on assigning work and monitoring technician productivity. Dispatch clerks were assigned to cover 15-20 technicians and over time learned their capabilities (skills), the geography they worked in and, most importantly, became proficient at predicting when technicians would be available for the next assignment. The ratio of 15:1 technicians to dispatchers was costly to sustain, especially for Telecoms with tens of thousands of technicians.

Bell Operators started to deploy first generation workforce management systems, such as Telic's INFORM™ in the mid-1980s. These systems eliminated the paper work-orders by creating electronic documents and providing job assignment, job estimates and job tracking.

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Wireline remote access devices such as CATS™ were introduced by Bell Labs and technicians could then receive work orders and complete and send status updates independently. While this technology allowed for technician independence, the loss of dispatcher control became evident in decrease in technician productivity, as well as the predictability of job completion and assignment. As data services and the internet exploded in the early 1990s, second generation workforce management solutions were introduced to provide more sophisticated dispatch algorithms and supporting applications for billing, testing, facilities, etc. Low compliance and utilization were accepted by operations, who blamed them on inadequate system functionality and performance. Laptops and wireless devices were also introduced to the technicians, but the low data speeds were frustrating and the laptops were bulky and not field friendly. Technicians therefore insisted on leaving their wireless laptops in their vehicles – rendering them ineffective as tools to help improve productivity.

Today, CSP' deliver substantially more complex services for both their business and residential consumers. These services require significantly more coordination and collaboration internally as well as externally with contracted labor and equipment vendors. Next generation MWFM solutions need to provide predictive analysis, task decomposition and orchestrate collaboration with internal and external organizations. These MWFM solutions will be a key building block in supporting and transitioning the Communication Service Provider's to becoming a multi-service delivery provider by offering services such as triple-play, smart homes, etc.

MWFM solutions must also provide the option of running on multiple mobile platforms (i.e. Smartphone, Blackberry, Tablets and laptop, etc.). Since Technician schedules and assignments can fluctuate throughout the day, Technicians are required to carry these devices throughout their tour usually around 8 hours. Since this tool/device is their connection to the enterprise it must be easily accessible, seamlessly integrated and on a platform that is suitable for a technician working in a field environment, both portable and functional.

The next generation MWFM solution should also require minimal user intervention for configuration and daily operational updates, such as new outside plant facilities, new technician skills, vacation updates, sick leave, etc. Data inputs retrieved from interfacing systems must be fully automated to avoid creating upfront data input errors in the assigning and routing of work orders.

The business performance of the system should also be monitored to ensure that optimal efficiencies are gained and the pre-deployment metrics and post-deployment projected metrics are aligned and produce anticipated results. Most importantly, local management must monitor utilization and take corrective action immediately when there is noncompliance. As communication providers are transitioning to wireless applications and cloud services, it is important to understand the overall CSP investment strategy and how to support this transition by deploying next generation OSS. The following are some examples of the types of metrics that can be achieved with next generation mobile workforce management solutions.

TOA's ETA routing exercise achieved superior results for a major CSP across multiple dimensions when compared to their current mobile workforce management solution:

- ~20-25% fewer technicians used
- ~7% improvement in travel distance/time
- ~90-95% reduction in overtime
- ~50-65% improvement in idle time

## Where are Communication Service Providers Investing Today?

Today the Communication Service Providers are investing the majority of their budgets into the following key initiatives:

- 1. Wireless Network Infrastructure** – Increasing Bandwidth will be the key to supporting new services. Smart devices and high-bandwidth content are driving the demand for increased data at higher speeds. In preparation for the projected increased bandwidth needs, large network infrastructure expansion projects are taking place throughout most major Telecoms (e.g. LTE network rollouts by Verizon, AT&T).
- 2. Content /Video** – Increasing Average Revenue Per User (**ARPU**) through richer content like interactive games, on demand movies, education, etc. The battle for increasing ARPU has slowly transformed over the years from wire line to wireless. As wireless bandwidth increases with 4G and next generation wireless technologies, the wire line revenue will decrease further and the wireless revenue will increase. CSP's like Verizon and AT&T and others that offer complete triple play services will see an increase in ARPU from the traditional wire line services.
- 3. Customer Experience Management** – Improving the customer experience as a differentiator to **reduce churn** is a major effort that all CSPs have engaged in. The increase in number of applications and content delivered to the consumer in both wireless and wireline domains not only places significant demand on the network, but also on the assurance of service. This will be more important as CSPs transition to the additional bandwidth consuming and complex Cloud-Based Services.
- 4. Cloud-Based Services** – The **introduction of new services** like infrastructure, platforms and software. These services will create new channels for revenue, but will require investment in infrastructure as well as a transformation from traditional service offerings to more collaborative service offerings. Processes and systems will need to control service assurance and well defined collaboration will be needed to quickly restore service to the customers.

## What Is The Changing Environment For Mobile Workforce Management?

With all of the changes projected for Telecommunications, the need for optimizing the workforce and providing better internal and external collaboration will increase. As Telecoms focus their efforts and investments on the wireless services, the wireline services will still need to be supported and maintained. The wireline copper operating budgets for most CSPs has decreased substantially and this decrease will require CSPs to maintain Service Level Agreements, Key Performance Indicators, etc. with fewer budget dollars and less resources. Since the largest OPEX costs are the human resources, increasing productivity and decreasing back office support will be paramount in this transition. Also, the reduction in investment in copper outside plant facilities will place a significant trouble load on CSPs and will require more efficient fault isolation and fault resolution.

TOA's ETA routing exercise achieved superior results for a major CSP across multiple dimensions when compared to their current mobile workforce management solution.

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There are some misconceptions that wireless networks only require network technicians and not field technicians/engineers. This is partially true, but there are many service technicians/field engineers that have the responsibility of running cables for the wireless backhaul to the wired network, maintaining tower and cell site equipment, etc. So, as the Telecoms transition to 4G and additional wireless service offerings there will be a demand for more fiber and equipment to support the bandwidth, thus increasing the need to manage and optimize the productivity of the network and field engineers. Next generation mobile workforce management solutions that have the ability to do predictive analysis, task decomposition and collaboration with internal and external organizations, will be key in supporting both wireless and wireline domains as the CSP's go through transformation.

## Managed Vendor Operations Services

With the introduction of Cloud-Based Services, new concepts around mobile workforce management can be explored and implemented. The highest costs that Communication Service Providers incur are: 1) the network infrastructure (CAPEX) and 2) the Operating Expense (OPEX) human resources to support the network, outside plant and customer premise equipment. Most CSPs use contract labor to either supplement their internal workforce or completely outsource specific tasks to a third party. The challenge with contract labor is that it is difficult to manage and integrate into internal processes as well as the company's Operational Support Systems.

With the introduction of cloud-based mobile workforce management, you can now control this process through Managed Vendor Operation Services (MVOS). CSPs can use their internal commercial off the Shelf (COTS) cloud-based solutions such as TOA's ETAdirect™ mobile workforce management solution to manage this process and obtain the following benefits:

1. Managing Vendor Operation Services, a new concept of managing contractors through a cloud-based MWFM system. Contractors have the ability to dynamically bid on work by the regions that they support, the technician skills they have available and the type of vehicles available (i.e. bucket trucks, vans, etc.). A monthly fee can be charged to the contractor for using this service. These fees paid by the contractors can off-set the monthly licensing fees that CSPs are currently paying their cloud-based MWFM vendor. TOA's ETAdirect™ provides "Least Cost Based Modeling" that can provide the controls to manage the vendor bids based on the information the contractor/supplier enters into the system.
2. Contractors that win bids will have access to the MWFM through web access and technicians will automatically be assigned their work orders via vendor provided smart phones, or laptops. These assignments will be based on parameters (skills, geography, tour, etc.) that are entered into the system by the vendor.
3. Contractor technicians will now be seamlessly integrated into the CSP's MWMS and other enterprise systems and can status, review and close work orders in real-time. Other system access i.e. tests system, facilities system, etc. can be monitored and controlled through ETAdirect™.
4. Multiple vendor collaboration for tasks that need to be done sequentially can occur (for example, one contractor installs the drop wire from the pole to the customer premise, another installs the Network Interface Device/Optical Network Terminal, another the inside wire, routers, Set Top Box, etc.). Collaboration can also be used for post work-order completion tasks such as Customer Satisfaction and follow-up for an up sell or technical assistance. The collaboration of all these vendors' tasks is complex to coordinate and usually leads to technician overlap and lost productivity. ETAdirect™ provides "predictive analysis" that uses historical data to provide the most accurate assessment of when the tasks will be completed based on the individual technician performing the work. This feature will minimize overlap and optimize the technician and vendors arrival times, and in turn, increase productivity.

5. Monthly contractor reviews can be conducted based on reports provided by the MWFMS. These reports will include customer satisfaction, productivity, total costs per job, repeats and reworks. CSPs can evaluate their vendors on a monthly, quarterly, etc. basis and continue, or cancel vendor contracts based on objective performance.

## Managing the Supply Chain

With the growth of manufacture outsourcing, companies now have thousands of suppliers that are difficult to qualify, onboard and integrate into their internal management systems for purposes of supply chain communications and collaboration. Sometimes, Microsoft™ Excel spreadsheets are the only immediate collaboration tools available, which leave much of the day-to-day collaboration story untold.

Changes to production forecasts typically occur overnight. Managing these fluctuating forecasts impacts business from end to end, as management needs to predict the demand for goods and services and balance with the required inventory. This means that forecast revisions have to be shared in real-time or in near real-time with stakeholders throughout the supply chain. This is impossible to do unless you have tightly integrated systems, beginning with CRM and extending to ERP, Supply Chain Management and Mobile Workforce Management.

CSPs and their suppliers need real-time visibility and workflow automation for purchasing and inventory management, as well as for automation of order fulfillment and logistics execution. They can no longer wait for computer “batch processes” to run overnight and generate reports that they read in the morning.

## What The Cloud Provides

There is widespread agreement that the single, most pressing issue for companies today with supply chain responsibilities is to get their arms around their burgeoning supplier networks. This is an area particularly well matched to current cloud provider strengths.

“A typical cloud supply chain solution already has the entire infrastructure in place,” says Mark Woodward, CEO of supply chain solutions provider E2open. “In our case, we have 50,000 suppliers and trading partners already in our network, so when a client comes to us, we are able to connect them to a rich community of partners almost instantaneously. This not only means that our customers are up and running more quickly, it also means they are significantly cutting down on onboarding and associated costs for both themselves and their partners.” Other supply chain cloud solution providers have similar supplier repositories, which mean that company processes for supplier qualification and setup for supply chain communications and collaboration are dramatically reduced in both time and expense. “Overall, we see the market starting to change,” notes Woodward. “More and more, CIOs and their teams are beginning to think about cloud-based supply chain management as a competitive requirement. It’s simply no longer possible to run a globally integrated supply chain with traditional ERP and internal systems alone, and leading companies are starting to realize that.”

Global enterprise customers will benefit the most from cloud services, because they can significantly reduce capital investments required to build and equip their data centers and shrink the size of their IT organizations.

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## How TOA's ETAdirect™ Can Help in Supply Chain Management

1. Since ETAdirect™ is a cloud-based solution that processes all of the customer service order information/data (i.e. customer location, equipment needed, estimated arrival time of technician, commitment time, fleet, etc.), it can provide the necessary information for the coordination of equipment deliveries. These deliveries can be to the customer premise, central/exchange office, or to a CSP designated locker or depot. This will allow for "just in time" inventory and will reduce inventory leakage and also eliminate hoarding of obsolete equipment, estimated at \$8-10,000 a year per vehicle.
2. Equipment vendors (i.e. Motorola, Cisco, etc.) can have pre-negotiated contracts or bid on supply shipments in near real time. Control of delivery and coordination can be based on commitment times or actual supply inventory kept in ETAdirect™ and provided to the cloud.
3. Vendor to Vendor Collaboration/coordination is enabled by providing a common collaboration platform to members of the Supply Chain community (electricians, CPE installers, audio technicians, etc.)
4. RFID and GPS data can be integrated with ETAdirect™ on the vehicles and can maintain equipment inventory thresholds and provide real-time deliveries based on vehicle location, ETA and customer commitments.

## Mobile Workforce Management Solutions for Enterprise

Communications Service Providers are quickly becoming the front-runners in cloud-based services. Verizon has made strategic acquisitions like Terremark to deliver cloud-based data center services; AT&T has already announced major offerings in this space, such as cloud-based mobile applications and cloud-based storage. Many other tier 1 and tier 2 carriers are moving in the same direction. CSPs will be both consumers and suppliers of cloud services. The CSPs have the advantage of being able to bundle enterprise communications with their own cloud-based services and provide end-to-end service level guarantees. These two reasons will give the CSPs a significant advantage in the delivery of their own cloud service offerings and in some cases become a reseller of partner cloud service offerings.

Enterprise customers are used to buying individual cloud service applications such as Salesforce.com™ (SFDC) but will proceed cautiously to relinquish total control to the cloud. As the benefits of cloud offerings are demonstrated over time, the enterprise customers will have substantial data to support their business case for transition to cloud services. Global enterprise customers will benefit the most from cloud services, because they can significantly reduce capital investments required to build and equip their data centers and shrink the size of their IT organizations.

## TOA Technologies' ETAdirect™ Solution

The TOA solution is cloud-based mobile workforce management software – and how is it different from traditional workforce management software? What are the advantages of cloud-based MWFM over premises-based software?

Next generation mobile workforce management solutions that have the ability to do predictive analysis, task decomposition and collaboration with internal and external organizations, will be key in supporting both wireless and wireline domains as the CSP's go through transformation.

## MWFM in the Cloud

“Cloud” is often used as a metaphor for the Internet. When mobile workforce management is offered as a service in the cloud, it is ready to use. It is provisioned from redundant virtualized and secure computer data centers over the Internet. This provides for access anywhere through a web browser, and data and apps are stored on servers in secure data centers. TOA's ETAdirect™ also has the ability to divide the job into discrete tasks. This is a key functionality required to drive processes and collaboration with other vendors within the Cloud.

## Cloud vs. Traditional MWFM

There are a number of differences between cloud-based MWFM and traditional MWFM software. Cloud-Based offerings have lower cost, offer an improved implementation timeline, do not require an investment for software support, deliver unlimited scalability, provide for easy remote agent access and keep complexity to a minimum. Cloud-Based MWFM also provides transparent upgrades by maintaining the current functionality and version while developing and testing the next version before making it available to the clients,

By comparison, traditional MWFM software solutions traditionally have a high cost, have a extended implementation timeline ,require significant cost for hardware/software support, scalability is limited, remote access is difficult, and complexity can be quite high depending upon the number of systems and the solution.

## Scalable and Secure

In addition to the benefits mentioned above, cloud-based MWFM offers scalable and secure solutions. Scalability is already built in to the solution, as is flexible peak-load capacity. The cloud offering also delivers near real-time provisioning of additional server capacity and performance monitoring. Security-focused resources, the latest security infrastructure and encryption and strictly enforced procedures and processes protect all MWFM processes in the cloud.

## Implementation

Implementation of the cloud-based MWFM solution is designed to be easy. When a user signs up for the service, an account is provisioned at the data center and the user is ready to go. Login grants access to the application through a Web browser and data is loaded so the system can be configured according to needs. Many may wonder why costs are lower in the cloud, and the

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answer is really simple - with a shared infrastructure, everyone shares the cost, driving it lower for each user. There is no investment in hardware or software licenses – users simply pay a monthly or annual subscription. Support, maintenance and operations are included in the subscription and all upgrades are free and automatic. Ensuring that the cloud-based MWFM solution integrates with all systems and programs that impact the workforce helps to ensure that a company gets the most value from the solution. Choosing the right system integration partner is key to the success of the project. Using eTOM, SOA and SID will set the framework for a successful integration and implementation. Aricent has worked with the Telecom Management Forum frameworks on numerous SI projects and several MWFM integration projects. Having a deep understanding of the MWFM architecture and the complexities of integration to the back-end systems (i.e. Order Management, Billing, Trouble Management, etc.) will allow for a smooth integration and transition.

## Summary

As applications are transitioning to the “Cloud” more concepts and ideas around the benefits of collaboration will be identified. Early adapters of cloud services that are providing applications should not be overly concerned of the new technology. SAS (software as a service) has been around for years so the risks and benefits have been clearly documented. The excitement is in identifying new concepts and applications on the cloud that can optimize your processes, resources and business. Mobile workforce management cloud applications are in a unique position to play a key role in managing not only your internal resources, but they will provide the functionality of collaborating and managing your external resources and vendors as well.

## Citations

- a. Traditional vs. Cloud-Based Workforce Management Software for the Call Center: What's the Difference? by Susan J. Campbell, TMCnet Contributing Editor May 12, 2010
- b. Is Supply Chain Management Emerging from the Clouds? by Mary Shacklett, April 2, 2010
- c. Yankee Group: Bringing Cloud Services to the Enterprise by Sandra Palumbo, Research Fellow George Hamilton, Principal Analyst March 29, 2011

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