

# Mobility in Manufacturing: Creating the Connected Enterprise

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# Introduction

The state of mobile adoption in the manufacturing sector – especially in core manufacturing and shop floor environments – has been low when compared to other sectors as many manufacturing organizations typically take a cautious approach to technology investment. Among the most significant barriers holding back adoption has been the general lack of wireless infrastructure in manufacturing environments in addition to concerns regarding wireless security. This is set to change with the number of mobile connections within global factories expected to almost double by 2017. Manufacturing organizations are just beginning to figure out what mobile can be used for.

## Aging Infrastructure and Productivity Concerns Placing New Pressures on Manufacturers

Mobile enablement has the potential to have a profound impact in the enterprise, and manufacturing organizations will be no exception. Manufacturers are keen on leveraging mobile technologies that can deliver better collaboration and workflow, productivity gains, improved quality, and most importantly, lowered costs in their production processes. Consider the fact that over 50 billion machines are in use in manufacturing plants the world over. These exert a maintenance cost burden that exceeds \$450 billion annually (Exhibit 1). In addition, addressing critical regulatory and compliance requirements and worker safety concerns are all areas manufacturing organizations are looking to leverage mobile solutions.

### Exhibit 1: Key Manufacturing Shop Floor Pain Points and Mobility Impact

Typical Business Challenges & Pain Points	Mobile Features and Capabilities
<ul style="list-style-type: none"> <li>▶ Over 50B machines in use globally. Annual global maintenance spend exceeds \$450B</li> <li>▶ A large plant can support over 400 operator routes with over 90K measurement locations driving a substantial number of recommendations and work orders</li> <li>▶ Organizations increasingly operating at or near 100% capacity</li> <li>▶ Increasing risk and regulatory compliance issues and need to adopt new requirements faster</li> <li>▶ Cost of downtime in heavy process industries can represent 1-3% of revenues.</li> <li>▶ Increasing worker safety and safety compliance requirements</li> <li>▶ Current processes are either manual (paper-based) or mobile batch applications (requires sync @ beginning of shift and end of shift)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Integrate measurement points and readings directly into backend ERP, CMMS, EAM platform</li> <li>▶ Compare with historical trend data in real time to avoid outages</li> <li>▶ Generate notifications/recommendations/ work orders on the spot</li> <li>▶ All assets are bar coded/RFID tagged to access complete work history</li> <li>▶ Location services to streamline asset location</li> <li>▶ Automatically calculate readings, limits, alerts and collection frequencies</li> <li>▶ Support for tablets and handheld devices/smartphones. Greater display real estate on tablet driving greater inspection rounds efficiencies</li> <li>▶ Support offline functionality</li> </ul>

Mobile Use Cases and Workflows	Mobile Business Impact
<ul style="list-style-type: none"> <li>▶ Automatic provisioning of rounds/routes (no need to download)</li> <li>▶ Eliminate need for batch sync on PCs</li> <li>▶ Take measurement points and perform maintenance inspections on rounds</li> <li>▶ Execute environmental, health, fire and safety inspections</li> <li>▶ Perform compliance inspections</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increase in work capacity of 10-15%</li> <li>▶ Increase in labor productivity by 30-35%</li> <li>▶ Greater work order tracking and accountability</li> <li>▶ Significant reduction in preventable failures</li> <li>▶ Maintenance backlog reduction</li> <li>▶ Reduce inventory carrying costs by 5-10%</li> </ul>

Another growing concern for manufacturing organizations is in the management of their assets and production equipment. As a manufacturer, ensuring that hard assets are operating at their potential is a key requirement for success. An additional challenge manufacturers face is in the aging installed base of production machines and vehicles. While most new production equipment has the ability to be independently run and operated, older solutions require greater direct support. The use of mobile solutions to support equipment calibration, test and measurement application, uploading programs and other asset management functions provide significant benefits to equipment uptime in addition to workforce productivity.

Lastly, as manufacturing organizations focus on transitioning into more service-centric entities; another key challenge has to do with their aging workforce and the talent gap it is creating. Manufacturing organizations are facing a mass exodus of workers over the next 5-10 years and are challenged to recruit and retain new workers, especially with younger workers staying in the same position for a shorter period of time. Consequently, much of the institutional knowledge has not been well codified and often “retires” with the workers and the traditional “word of mouth” approaches to on-the-job training is not sustainable. More than ever, manufacturing organizations need to better document and continuously improve work processes.

Workforce productivity is a key indicator in manufacturing and one that aligns well with mobile solutions. As indicated by our research, workforce productivity represents the single greatest metric used by manufacturing organizations to measure mobile ROI. However, while there has been a narrative suggesting significant productivity improvement in the manufacturing sector in the US, productivity numbers indicate that this is not yet the reality. In fact, US productivity has only averaged an annual increase of 2.5% since 1999, compared to 4.2% growth in the EU and 8.5% growth in China (Source: BCG).

## Exhibit 2: Focus on Mobility as Productivity and Revenue Enhancement Solution



### Mobility Investments as a Strategic IT Asset

Leading manufacturers are leveraging IT investments more strategically, especially in the context of their customer initiatives and operational mandates. In this context, mobile solutions are especially valuable, considering the distributed nature of the workforce and the need to be connected to workers at all times. In fact, according to VDC's research, the mobile manufacturing workforce is the fastest growing workforce segment. For instance, the workforce responsible for inspections and quality control is expected to grow by 8% through 2020.

Facing the combined pressures of maintaining and upgrading aging infrastructure and delivering improved customer service, manufacturers are focusing on increasing IT investment resources toward mobile solutions with 2016 budgets expected to increase by 6% over 2015. Moreover, approximately 23% of manufacturing organization's mobile budgets are allocated toward business critical line of business applications. These investment sentiments were clearly expressed in a recent survey VDC Research conducted among 125 IT decision-makers in the manufacturing sector who cited improving worker productivity, customer service and increasing sales as the top three metrics most closely aligned with their mobile solution investments.

## Accelerating Growth and Business Performance

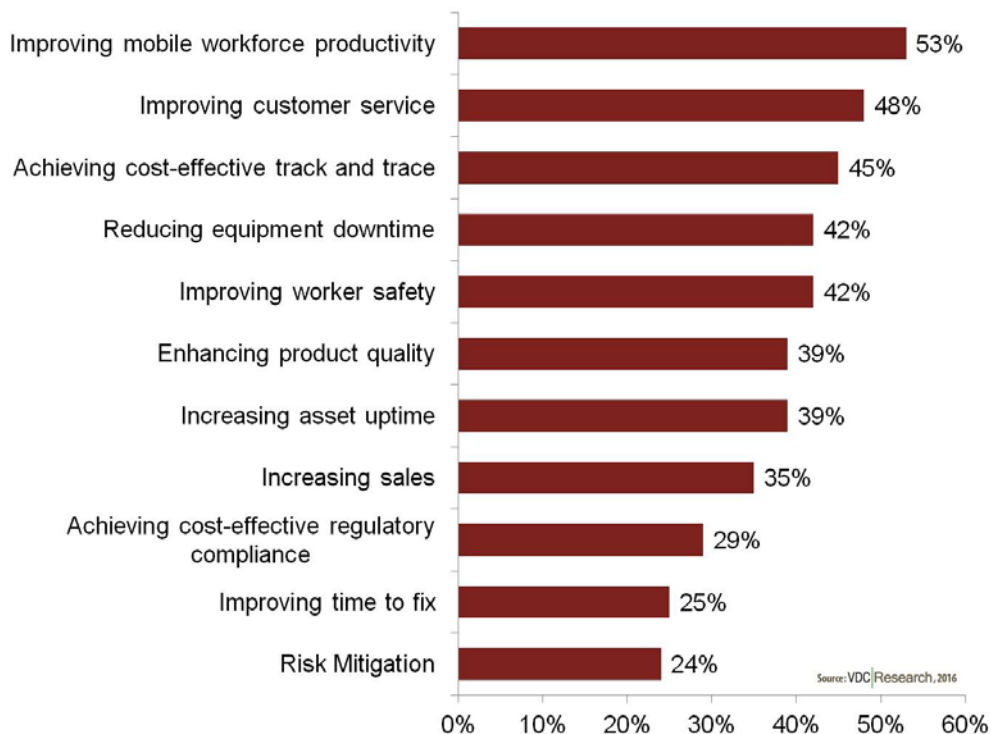
After years of focusing on cost-cutting, manufacturing organizations are looking for new ways to differentiate themselves and fend off disruptive new entrants. For many, the ability to gather data and turn it into insight is an important factor in building and sustaining competitive advantage. Enterprise mobility solutions are closely connecting to many of these initiatives, include:

*Increase revenue:* Companies are using mobile and connected solutions to find new ways to grow revenue and increase profits. For example, industrial equipment manufacturers are selling outcomes, like machine hours, rather than just products. This uses mobile and embedded and connected sensor technologies to measure use and enable predictive maintenance.

*Improve operational efficiency:* Tracking and maintaining assets in a manufacturing plant can be a time-consuming and costly endeavor. Location is becoming increasingly critical for asset management and inspection applications. Especially in large manufacturing plants, which can span multiple miles, the ability to easily locate assets that require inspection by using a mobile solution and indoor location service, in addition to geo-tagging and imaging the asset has the potential to greatly improve the efficiency of plant workers and inspectors.

*Improve quality control:* Quality control is the leading mobile shop floor investment initiative according to VDC's research. The ability to catch quality issues early helps contain the cost of a quality event by minimizing wasted labor, materials and equipment time.

### Exhibit 3: Most Important Metrics Manufacturing Organizations Use to Measure Mobile Solution ROI



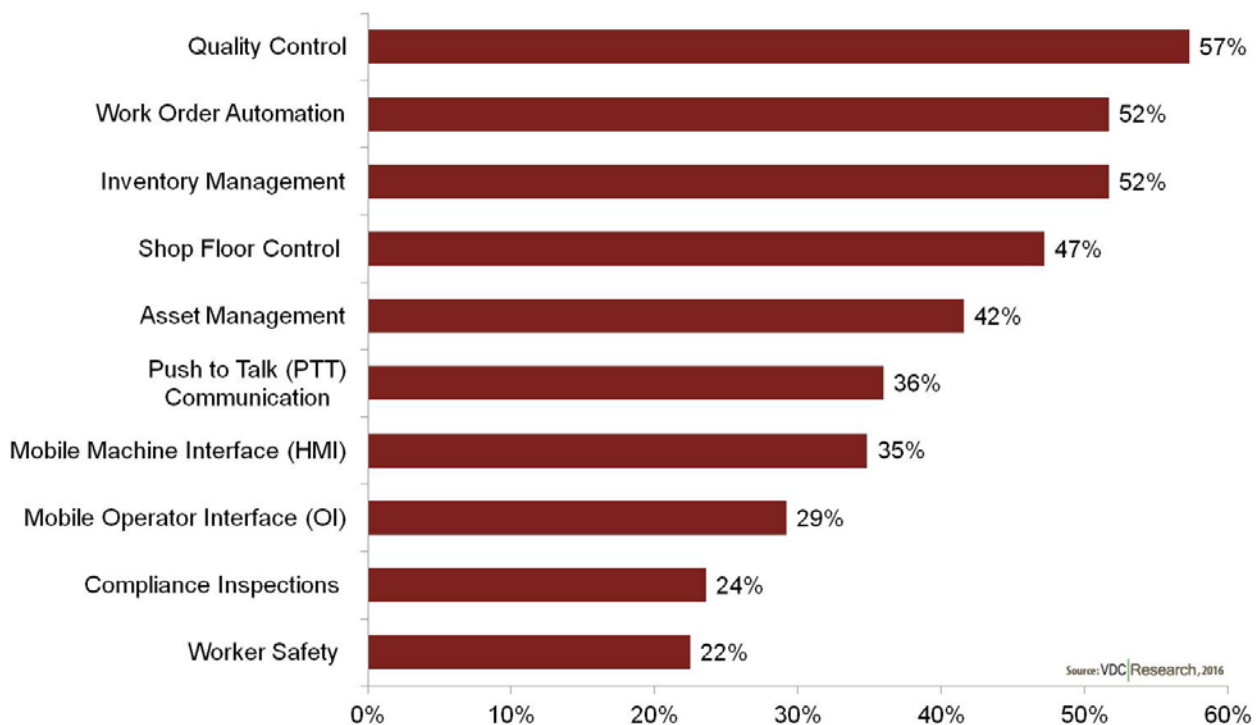
## Improving Safety and Reducing Risk

Safety is an immensely important topic in the manufacturing sector. In such a manual and label intensive industry, the risk for accidents and injuries is heightened – especially considering some of the hazardous work conditions. While safety measures continue to improve, the ability to leverage mobile solutions to address some of the gaps is great.

*Improve worker safety:* Mobile solutions can help keep employees safe, especially those working alone in hazardous areas. For example, lone worker applications or the use of wearable devices that can sense environmental factors — such as temperature, levels of toxic gases, or prolonged periods of inactivity — and identify when a worker has had an accident or is in imminent danger. The use of mobile solutions to provide safety information, report on close calls and on incidents will enable organizations to make the necessary improvements more expeditiously.

*Meet regulatory requirements:* Hazardous area “duty holders” are required under various pieces of government legislation to provide safe conditions of work for its employees and to ensure that all equipment employed in their operation is maintained in a safe condition by competent personnel trained in the use, care and maintenance of that equipment.

**Exhibit 4: Leading Manufacturing Shop Floor Mobile Applications**



# Addressing Infrastructure Requirements to Support Modern Mobility Initiatives

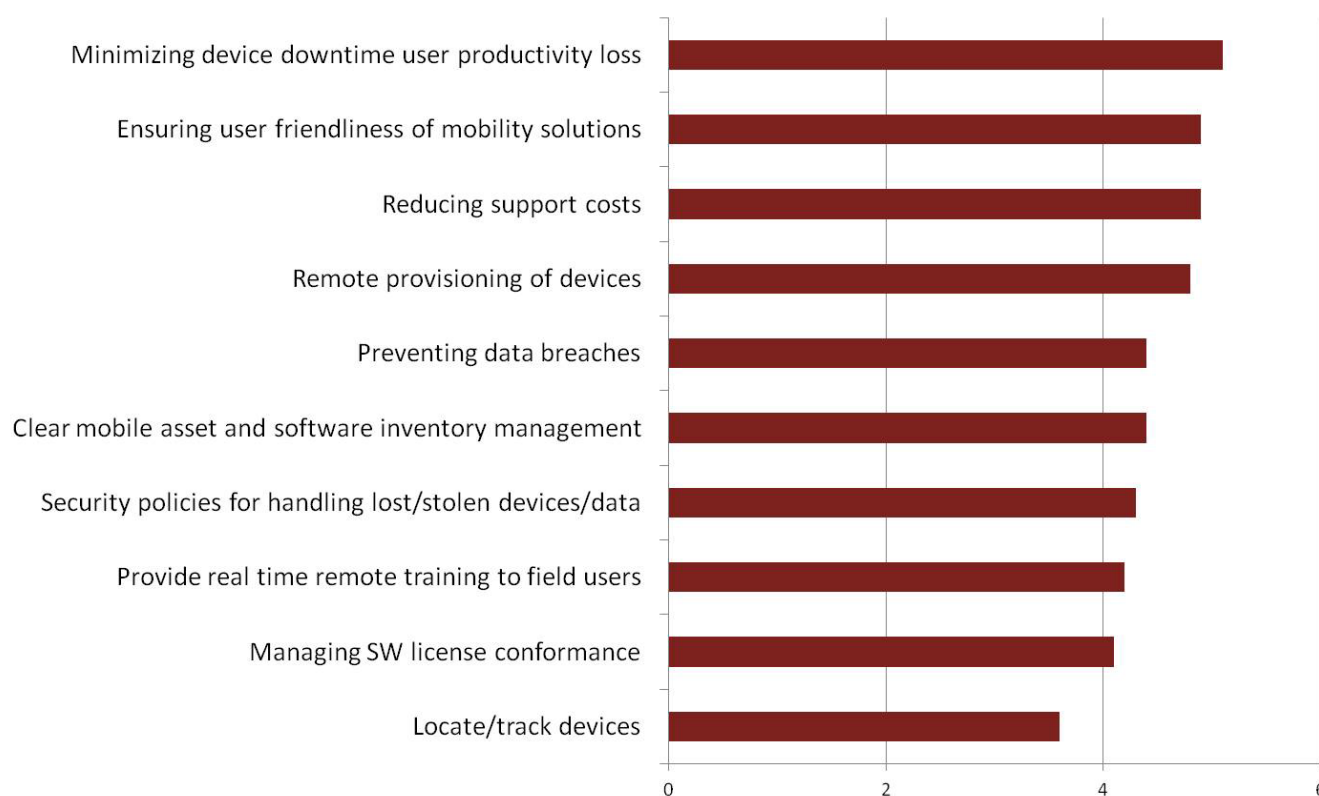
Whether supporting BYOD policies or enterprise issued mobile devices the value of enterprise mobile management platforms and mobile device management is far reaching. Core mobile device management solutions have evolved substantially into broader enterprise mobility management platforms that encompass mobile device and application management including higher levels of security services. Several core device management capabilities have commoditized and the market is becoming more actively engaged in deploying and managing mobile applications as well as providing secure access to existing corporate data stores to their mobile workforce. Leading solution providers are increasingly focused on developing secure file (content) management and collaboration, application management, and enhanced security functionality that is often referred to as containerization or “secure container.”

**Exhibit 5: Enterprise Mobile Management/Mobile Device Management Solutions**

EMM/MDM Services	Description	Key Capabilities
On-Boarding & Configuration	Configure devices and set policies	<ul style="list-style-type: none"> <li>▶ Standardized processes and delivery methodology</li> <li>▶ Demonstrated execution</li> </ul>
Support & Helpdesk	Provide helpdesk support Proactive troubleshooting	<ul style="list-style-type: none"> <li>▶ 24/7 capabilities</li> <li>▶ Self-service options</li> </ul>
Depot Services/ Provision	Provision devices, apps and policies	<ul style="list-style-type: none"> <li>▶ Customer dashboards and portals</li> <li>▶ Opportunities to self-service enroll</li> </ul>
Mobile Security	Secure devices, apps, network and data	<ul style="list-style-type: none"> <li>▶ Securing data at rest and in transit</li> <li>▶ API integration to better manage devices</li> <li>▶ Ease of use/unobtrusive design</li> <li>▶ Tracking and geo-fencing services</li> <li>▶ Compliance and governance</li> <li>▶ Strict control of corporate data</li> <li>▶ Consistent network security across all VPN implementations</li> </ul>
Telecom Expense Management (TEM)	Monitor, manage and reduce telecom expenses	<ul style="list-style-type: none"> <li>▶ Remote feature management</li> <li>▶ Sync restrictions</li> <li>▶ Management of roaming policies</li> <li>▶ User self service</li> </ul>
Mobile Application Management	Address full lifecycle services for mobile applications	<ul style="list-style-type: none"> <li>▶ Turnkey application lifecycle services</li> <li>▶ Application acquisition, distribution and provisioning, securing and tracking capabilities</li> </ul>
Content Management	Platform to extend corporate content securely for mobile employees, contract workers and partners	<ul style="list-style-type: none"> <li>▶ File synchronization and sharing services</li> <li>▶ Reducing physical content creation costs</li> <li>▶ Providing centralized locker for corporate content</li> </ul>
Monitor & Analytics	Monitor and report on device, service and compliance	<ul style="list-style-type: none"> <li>▶ Customer dashboards and portals</li> <li>▶ Solution usage trends</li> <li>▶ KPI measurement and tracking</li> </ul>
Lifecycle Support Services	Decommission devices upon departure or EOL	<ul style="list-style-type: none"> <li>▶ Turnkey lifecycle management services</li> </ul>

According to recent research by VDC many of the greatest mobility issues and concerns identified by enterprise decision makers are increasingly being addressed by today's enterprise mobile management platforms. While many decision makers will agree that early investments in mobile solutions have little to do with strategic initiatives and were primarily motivated by supporting "employee needs or demands" enterprise are looking to better leverage these investments and ensure that their ROI goals are being met. Thus, while ensuring the user friendliness of mobile solutions remains critical, other requirements such as minimizing device downtime and reducing support costs are becoming more critical.

**Exhibit 6: Mobility Issues of Greatest Concern to Enterprise Decision Makers**  
(1=No concern; 6=Great concern)



The benefits of today's MDM/EMM solutions cannot be understated. At the same time, the complexities and challenges of a rapidly evolving enterprise mobility landscape are just beginning to emerge. As the number of devices '*under management*' explodes – consider also the need to manage and support other remote or distributed, yet connected, devices such as wireless infrastructure, industrial controllers, panel PCs, automatic identification solutions, embedded sensors, etc. – the need for more scalable EMM/MDM platforms is rapidly emerging. Key EMM/MDM investment success requirements include:

- ▶ **High volume registration.** The ability to configure and register a high volume of users and devices at the same time through an easy to use and configure interface is especially important, especially looking at the rapid scale at which organizations are registering mobile and other networked devices.

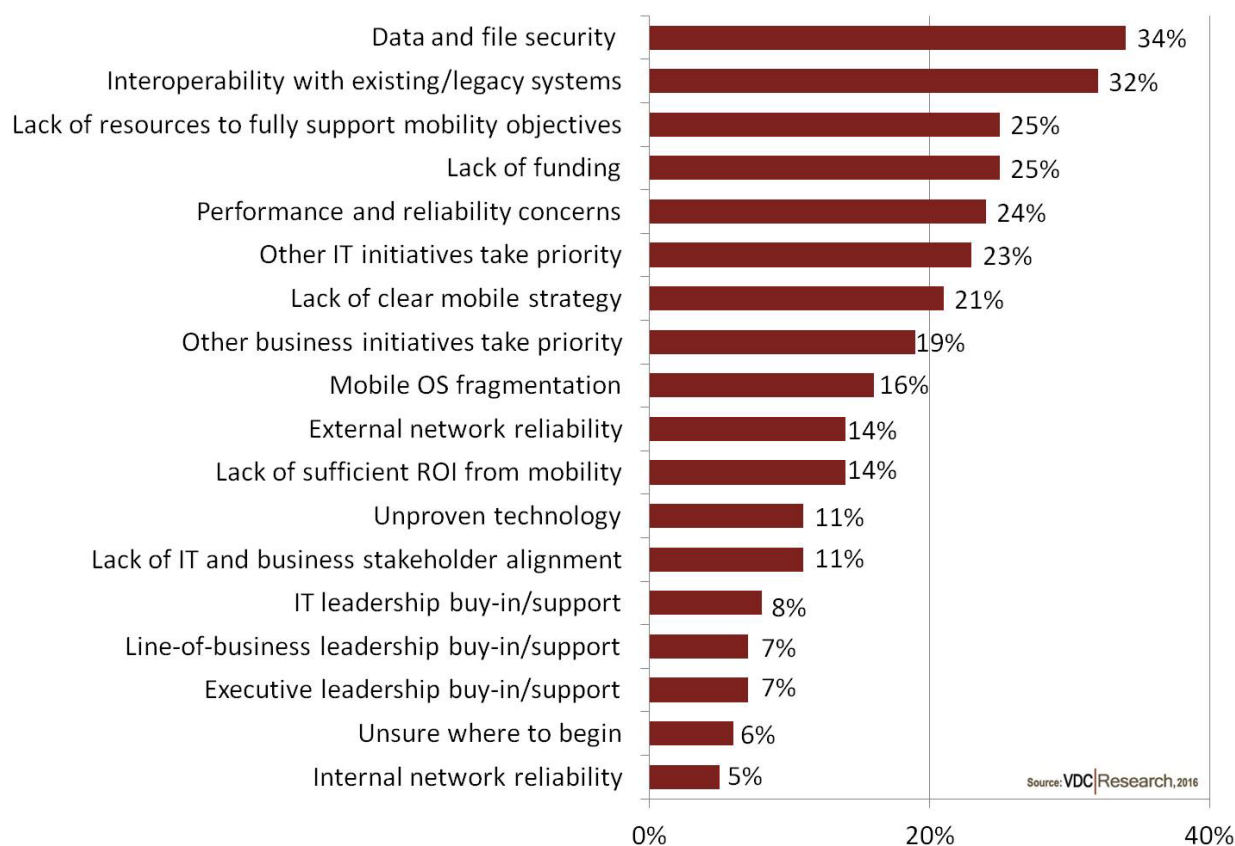


- ▶ **Application management.** The average number of applications per user is scaling just as rapidly as the number of devices. Moreover, the apps are growing in complexity and size. Provisioning and managing these is taxing network traffic and has the potential to stall the management platform.
- ▶ **OS management and support.** The fluid nature of the mobile OS landscape requires a management platform that provides rapid support for all device types, including other end points beyond mobile devices such as wireless peripherals. The nature of an increasing ‘*employee-enabled*’ OS change represents an additional wrinkle and support requirement.
- ▶ **Infrastructure support.** Direct and real-time integration with LDAP that saves ongoing administrative time and cost is critical. In addition, dedicated, VPN-like mobile application tunnels that secure app traffic end-to-end are essential.
- ▶ **Secure content management.** Secure content distribution and mobile data leakage prevention (DLP) are increasing requirements, especially considering the increasing volume of more sensitive information and files being accessed and processed on mobile devices.

# Addressing Enterprise Mobility Complexities and Internal Support Deficiencies Through Mobile Managed Service

The complexities associated with mobile implementations are expansive and range from device selection and provisioning to application and security management. For mobile applications to truly become the new face of a business, choosing the right partner(s) is critical, as third parties can reduce the complexity of managing and securing mobile deployments while delivering the level of service required for business-critical deployments. One of the clear challenges for many organizations – beyond technical or funding concerns – is the lack of internal resources to fully support their organization’s mobility initiatives, as depicted in Exhibit 7. There is no shortage of options for enterprise mobility decision-makers to consider when evaluating mobile managed services. However, considering the unique requirements of successfully managing mobile enterprise devices, certain capabilities trump others when defining quality of service requirements. Few IT departments have built a strong competency in mobility, and while a growing share of enterprises view mobility as strategic, the skills gap remains pronounced. For this reason, as employees are demanding support for their mobile devices, IT is at a crossroads: either develop competency in mobility or outsource it to a managed mobility or professional services firm. Considering the continual pressure to do more with less, outsourcing is becoming increasingly attractive.

**Exhibit 7: Greatest Barriers to Enterprise Mobility Initiatives**



This is opening the door for managed mobility service providers (MMS) to deliver critical support services. Reducing the complexity of mobile solutions and deployment timeframes are key factors influencing decision-makers to consider mobile managed services. This specifically ties to requirements around mobile logistics services. Especially for mobile devices supporting line-of-business applications, the need for streamlined staging, kitting, testing, provisioning, device depot services, diagnostics, and other mobile logistics and repair services is acute. According to VDC's research, staging/kitting and device provisioning were cited as two of the top three services most influencing a successful mobile deployment. MMS are continuing to optimize their mobile managed service offerings, are partnering to enhance the security posture of their solutions, and building out global partnership networks to support their mobile service capabilities.

**Exhibit 8: Core Enterprise Mobility Managed Service Opportunities**



To effectively address the needs of an organization in a manner that is both scalable and impactful, some of the most critical decisions and requirements begin with upfront planning and span logistics, sourcing and service requirements. The ability for mobile managed service providers to do this on a variable cost, transaction model

basis makes this an increasingly attractive option for enterprises. The scope of solutions provided by MMS is only expanding (Exhibit 8) making the selection process that much more challenging. From upfront planning, strategy formation and mobile deployment capabilities, logistics and advanced exchange services to mobile analytics and other value added services, aligning the right service profile with your business requirements is critical.

Mobility is transformational in how manufacturing organizations are operating and responding to the growing challenges they are facing. Mobile solutions represent a crucial channel for interfacing and interacting with customers and employees and improving unique manufacturing workflows, especially as the mobile manufacturing workforce rapidly scales over the next five years. Considering the recent advances, we have witnessed in mobile device, network, and application sophistication, opportunities for enterprise mobility solutions are increasing rapidly. By applying emerging technologies to help manage their mobile workforces, forward looking manufacturing organizations are seeing almost immediate benefit through lower costs, higher workforce productivity, improved worker safety, and enhanced customer experiences.

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### About Stratix Corporation

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Stratix is the trusted advisor for many industry leading global enterprises, offering the most comprehensive managed mobile services portfolio to operationalize and deliver full value for our clients' mobile investments. With over three decades of experience, Stratix has the proven mobile expertise and service execution to help companies transform any mobility challenge into a competitive advantage. Through a proven outsourcing model, we enable our customers to manage their entire mobile lifecycle as they plan, purchase, deploy, support, measure, report and analyze their mobile solutions.

Today, global businesses have more mobile technology options available than ever before, which is increasing both complexity and the demand for mobile expertise, deployment resources and 7x24 mobile support. Through our managed mobile services, we work with and manage our customers' needs for rugged mobile devices, "consumer" tablets or smart-devices, mobile device management, bring-your-own-device solutions, 7x24 support, mobile applications and many other complex mobile decisions. For more information about Stratix Corporation, visit [www.stratixcorp.com](http://www.stratixcorp.com).

### About SOTI

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**SOTI** SOTI is a proven product innovator and EMM Industry leader. Over 15,000 customers across 170 countries rely on SOTI for their EMM needs. We have strong partnerships with hardware manufacturers, providing support for new mobile devices and operating systems well before the competition. We understand the unique requirements of our partner's industries, including logistics, retail, healthcare, education and field services. SOTI has a strong focus on R&D and we are constantly innovating to do whatever it takes to keep our customers happy and successful. Making day to day mobility management easy lets the enterprise take mobility to endless possibilities.

# VDC Research

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## About the Author

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**David Krebs** has more than ten years experience covering the markets for enterprise and government mobility solutions, wireless data communication technologies, and automatic data-capture research and consulting. David focuses on identifying the key drivers and enablers in the adoption of mobile and wireless solutions among mobile workers in the extended enterprise. David's consulting and strategic advisory experience is far reaching and includes technology and market opportunity assessments, technology penetration and adoption enablers, partner profiling and development, new product development, and M&A due diligence support. David has extensive primary market research management and execution experience to support market sizing and forecasting, total cost of ownership (TCO), comparative product performance evaluation, competitive benchmarking, and end-user requirements analysis. David is a graduate of Boston University (BSBA).

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## About VDC Research

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Founded in 1971, VDC Research provides in-depth insights to technology vendors, end users, and investors across the globe. As a market research and consulting firm, VDC's coverage of AutoID, enterprise mobility, industrial automation, and IoT and embedded technologies is among the most advanced in the industry, helping our clients make critical decisions with confidence. Offering syndicated reports and custom consultation, our methodologies consistently provide accurate forecasts and unmatched thought leadership for deeply technical markets. Located in Natick, Massachusetts, VDC prides itself on its close personal relationships with clients, delivering an attention to detail and a unique perspective that is second to none.

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