SOLUTION SPOTLIGHT

Accelerating Digital Transformation with Wearables

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Organizations across the globe are accelerating their digital transformation (DX) strategies as the fundamental shifts in demography, changing consumer preferences, and how products and services are consumed in the digital world are rewriting the rules of engagement. With digital platforms such as Uber, WeChat, Airbnb and Amazon, customers today have become accustomed to instant information, and expect demand fulfillment quicker and now, with end-to-end visibility on their mobile devices. The digital disruptors are challenging incumbents across sectors, necessitating organizations to further wire-up processes and assets with sensors, and deploy wearable computing such as smartwatches and augmented reality and virtual reality (AR/VR) headsets to enable real-time information access in the field, provide handsfree computing for employees, and also for employee safety and wellness.

According to IDC's Worldwide Quarterly Wearable Device Tracker, which includes both consumer and commercial segments, and categories such as clothing and earwear, vendors will ship a total of 121.7 million wearable devices this year, marking a 16.6% increase from the 104.4 million units shipped in 2016. The wearables market is forecast to maintain this pace of growth with shipments reaching 229.5 million units in 2021, resulting in a five-year compound annual growth rate (CAGR) of 17.2%.

However, deploying wearables in the enterprise is not without challenges such as managing diverse device and operating system (OS) platforms, application delivery, monitoring performance and upgrades, ensuring security and, above all, delivering a superior user experience. This IDC Solution Spotlight takes a look at the wearables landscape and discusses how the Samsung SDS Enterprise Mobility Management (EMM) for Wearables solution can help take away complexity from wearables deployments while ensuring improved security and management.

Situation Overview

At the core of the digital economy is 3rd Platform technologies which enable businesses to accelerate their DX journey and create new channels for engagement with both customers and employees. IDC identifies the 3rd Platform as four technology pillars – big data and analytics, cloud, mobility and social – which form the most critical foundational elements that can help enterprises successfully adapt to a new digital economy. The following sections take a closer look at the new imperatives of the DX economy as well as key trends around enterprise mobility and end-user computing (EUC).

The DX Economy and New Imperatives

IDC predicts that by 2021, at least 50% of global GDP will be digitized, with growth in every industry driven by digitally-enhanced offerings, operations and relationships. This is the ticking clock that is (or should be) driving every organization to move quickly along its DX journey. Organizations that are slow to digitize their offerings and operations will find themselves competing for a progressively shrinking share of their market segment's opportunities. Therefore, many leading organizations across the globe are exploring new initiatives that can further digitalize and automate their business

processes with emerging technologies – artificial intelligence (AI), the Internet of Things (IoT) and wearables such as smartwatches and AR/VR headsets – to drive productivity and efficiencies, and to create new engagement channels for employees, customers and partners. It is increasingly becoming clear that organizations that will lead in the digital economy will be those that continue to drive innovation and use digital technologies for competitive advantage.

Mobility Is a Strategic Priority

As identified in IDC's C-Suite Barometer Survey 2017, mobility today is among the top strategic priorities for CXOs, as a mobile-first mindset takes shape. Enterprises are expected to continue to invest in mobility initiatives, and worldwide spending on mobility will reach US$444 billion in 2018. The retail, finance (including insurance), healthcare, government and education industries will account for 45% of overall spend.

While next-gen technologies such as IoT and AI garner media and industry attention, the mobility market continues to weave deeper into the enterprise fabric. Mobility has become the technology that enables businesses of all sizes – and across all industries – to extend productivity tools into the hands of their employees and to share information across screens seamlessly. It also provides the foundation for next-gen technologies such as AI, IoT and AR/VR to build upon. Leading organizations are already testing ruggedized devices and exploring the use of wearable computing to replace purpose-built hardware such as barcode readers, data entry consoles, walkie talkies and even paper forms. In fact, IDC predicts that by 2020, 15% of all field service technicians will utilize AR technologies that can help them with remote collaboration with globally dispersed teams, refer to knowledge base, guide actions through image recognition thereby reducing problem diagnoses and resolution cycle times, and improve productivity.

Growing Security Urgency

Deploying hardware such as smartphones and tablets is still among the top mobility priorities for organizations, while testing new devices such as smartwatches, smartglasses and drones is also gaining momentum. In a recent IDC survey, 24% of organizations indicated that they plan to launch or test new device initiatives over the next 12–18 months. However, the increasing diversity of devices, form factors, applications and OS platforms is creating unprecedented device management, application delivery and, most importantly, security challenges for organizations.

In the past year, headlines across the globe were marred with news of data breaches, undetected malware, hacking and growing sophistication of security threats. This has drawn attention to security at the highest levels of enterprises as well as regulators. Organizations are thus looking for solutions that can help them secure their data across the device, application, storage and transport layers. Specifically, organizations in the government, finance, healthcare and defense sectors are more susceptible to these threats and have stringent requirements around both corporate and private data protection and sharing. That said, security is critical for organizations in any sector, market or size, and must be attended to urgently. Software tools that help organizations with end-to-end security and raise predictive alerts, or help organizations respond quickly to security threats will continue to drive spending in mobility.

Expanding Regulations and Compliance

There has been a significant spike in security incidents such as data theft and distributed denial-of-service (DDoS) attacks at both enterprises and public institutions in the past few years. These include sophisticated DDoS attacks that often demand ransom in virtual currencies for reinstating services or for unencrypting data. In some cases, there is also evidence of state-sponsored attacks and data thefts for both strategic data or corporate secrets.

These issues have alarmed legislators and policymakers across the globe, and they are responding by creating stringent laws that include severe penalties for inadequate data security measures or negligence around reporting and responding to security incidents within a stipulated time frame.

On April 27, 2016, the European Union (EU) adopted the General Data Protection Regulation (GDPR) which will take effect throughout all EU member states on May 25, 2018. GDPR aims to strengthen data protection and privacy by laying down security, privacy and reporting norms for any organization storing or processing EU citizens' data, located either within or outside the EU. The penalties for non-compliance as per the law are severe and can go up to millions of euros, or 4% of the global annual revenues of a company. There are similar laws around citizen privacy and data protection being introduced in many countries worldwide. Therefore, organizations expanding their mobility initiatives will need to continue investing in technologies that will help them improve their regulatory compliance.

Rise of the Unified Endpoint Management Model

The device mix in enterprises has evolved dramatically in recent years, thanks to bring-your-own-device (BYOD) policies and wearable computing initiatives, as well as the advent of cloud-based systems and applications that has enabled anytime, anywhere access to corporate resources. This has certainly improved productivity and efficiencies at organizations, but at the same time has created enormous challenges for IT teams that are tasked with buying, deploying, managing and securing access across a diverse range of devices. Many organizations have deployed EMM software to manage their fleet of mobile devices; however, these platforms as they were developed, often only comprise capabilities aimed at managing mobile devices.

Now, as organizations begin to experiment with AR/VR, IoT and wearable computing, there is a need for broader device and application management capabilities. Some organizations are even exploring 3-in-1 devices, or mobile phones as a PC (such as Samsung DeX), to replace or perform tasks that are traditionally done by PCs. Also, as mobility becomes pervasive as a foundational pillar for digital initiatives, EUC and mobility management practices are increasingly converging, giving rise to unified endpoint management (UEM). Enterprises are increasingly looking for UEM software platforms that can help them control a wide range of enterprise devices – IoT endpoints and connected Internet devices such as wearables, smart office/conference room equipment, building automation, and other network-connected and employee-interfacing devices and platforms. Some EMM platforms have added UEM capabilities and leading enterprises are evaluating how well these EMM platforms that promise UEM capabilities can manage Internet-connected devices, as well as mobile laptops and stationary PCs. IDC predicts that by 2019, two-thirds of Windows 10 devices (PCs and tablets) will be managed via UEM platforms and one enterprise in every three will have consolidated its desktop and mobile management IT teams into a single operations unit. Similar upward UEM adoption trends are expected for other platforms.

Next-Gen Enterprise Mobility with Wearables

The first wave of enterprise mobility focused on providing access to corporate resources and business applications on mobile phones and tablets, but this is no longer sufficient in the DX economy. Leading enterprises today are driving mobility deeper into business process and operations by deploying wearable computing that brings real-time awareness and information to the fingertips of employees and partners.

Smartwatches

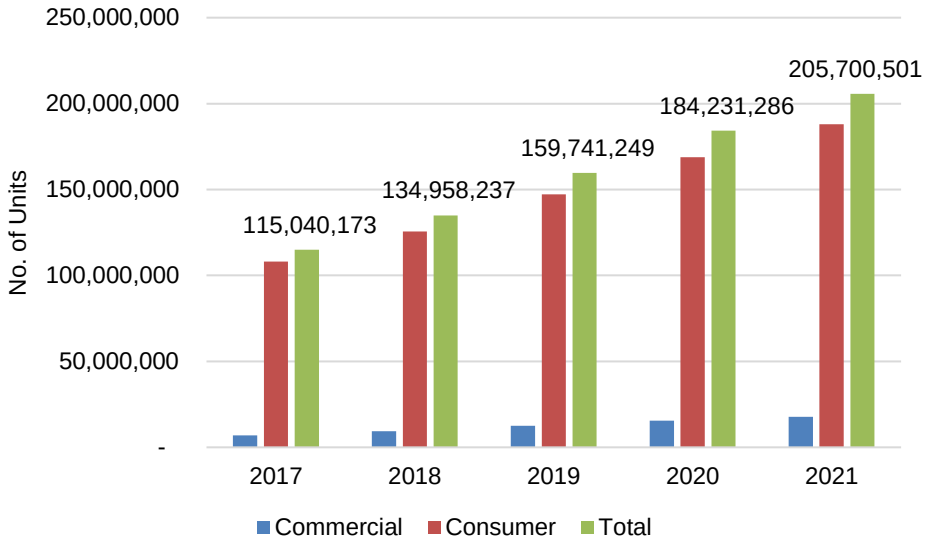
IDC predicts that by 2021, 25% of use cases in logistics and custodial jobs will be handled by multifactor authenticated smartwatches. Initiatives include deploying smartwatches and applications for task management and automated dispatch jobs, and providing real-time instructions and information for field staff in transportation and logistics, frontline staff in retail, hospitality and

healthcare, and public sector employees in defense, law enforcement and public infrastructure maintenance.

With benefits clear, IDC forecasts the wearable computing market to grow rapidly over the next few years. As shown in Figure 1, wearables adoption is expected to grow globally in both the consumer and commercial segments. However, commercial watch deployments are expected to grow much faster from just 3.3 million units in 2017 to reach over 11.5 million units by 2021 at a CAGR of 34%.

Figure 1

Worldwide Wearables (Watches and Wristbands) Shipments Forecast, by Market Segment, 2017–2021



Source: IDC Worldwide Quarterly Wearable Device Tracker, Q3 2017

Enterprise Use Cases for Smartwatches

Table 1 highlights some of the key use cases for smartwatches that have emerged across various sectors.

Table 1

Smartwatch Use Cases

Industry	Use Case Description
Public Sector	For law enforcement officers, e.g., field officers, to update status of patrol and dispatch activities, and to receive alerts and information
Healthcare	For frontline staff instructions, senior citizen monitoring, vitals monitoring for critical illness or for post-surgery and wellness programs
Retail	Collaboration tools and notifications for warehouse employees and frontline staff

Energy and Resources	Enable handsfree operations for maintenance and field staff; includes communication tools, notifications, work schedules, fault alerts, etc.
Transportation	Road or rail: Communications device for handsfree operation, notifications and tracking of drivers Airports: Provide instructions and collaboration tools for ground handling and logistics staff; includes use of wearables for communications for maintenance and flight operations
Manufacturing and Consumer Packaged Goods (CPG)	For notifications and instructions to employees working in the assembly line, logistics and warehouses, and maintenance and facilities staff
Hospitality	Hotels: For housekeeping or other staff to receive daily work schedules and timely notification messages Restaurants: For servers to receive alerts, order information and collaborate with other staff
Cross-Sector	Other sectors can explore use cases that can benefit from handsfree operations, smartwatch-enabled authentication and security, health safety and fitness applications for employees or customers, communication, and notifications and alerts for employees or partners, such as in maintenance and field services

Source: IDC, 2017

AR/VR Technologies

In addition to smartwatches, enterprise applications for AR/VR technologies are also increasing. IDC's Worldwide Semiannual Augmented and Virtual Reality Spending Guide 2017 forecasts the global market for AR/VR (including all hardware, software and services) for both the consumer and commercial segments to increase by 100% or more over each of the next four years. The total spending on AR/VR is expected to soar from US$11.4 billion in 2017 to nearly US$215 billion in 2021, achieving a CAGR of 113.2%. Although a lion's share of early growth in AR/VR will be driven by mobile devices, particularly for AR, purpose-built AR/VR headsets are also receiving a lot of attention from enterprises due to the superior experience offered over mobile-based AR/VR experiences.

VR Applications and Use Cases

For VR, IDC predicts that commercial spending will surpass consumer spending in 2019 as business use cases expand and the line of business and IT introduce new internal- and client-facing VR workflows. Organizations are finding many novel applications of VR and some of the key use cases, by sector, include:

- **Retail.** Organizations focused on selling goods to consumers are experimenting with VR across a wide variety of use cases. A key early success story has been around automobile showrooms, where consumers are given the opportunity to explore a wide range of interior and exterior options for a car they are considering buying.
- **Manufacturing.** Manufacturing companies are quickly adopting VR as a means of streamlining product creation as designers iterate and collaborate in real time, creating digital objects that will eventually become real-world products. This saves time and decreases the need to create multiple versions of high-cost, one-off items.
- **Healthcare.** The healthcare industry recognized early on the potential for VR to aid in the treatment of patients, particularly in the areas of mental health and recovery. In addition to these patient-facing use cases, VR will play an increasingly important role in training new doctors, as

well as making it possible for physicians to collaborate on diagnosis, treatment plans and even surgical scenarios.

- **Defense.** Many defense forces across the world are utilizing VR technologies for training and to simulate combat situations, teach reactions or create other hazardous settings to depict and understand the risks. There are also ongoing pilots to help soldiers and veterans deal with post-traumatic stress disorder.

- **Construction.** Construction companies are already embracing VR to improve internal workflows and customer-facing opportunities. Use cases include showing a potential customer their proposed building in VR instead of a physical model, or providing customization options for interiors, or utilizing VR for the actual design of the building.

Reaping the Benefits of Wearables

Wearables offer a range of benefits that can help improve productivity, efficiency and collaboration. More importantly, wearables empower employees with the latest technologies to keep them engaged and improve their outcomes at work.

- **Greater productivity through handsfree operations.** One of the top benefits of wearable computing is that it eradicates the need for handheld devices such as mobiles or tablets, thus helping to increase productivity. There are also situations where mobile technology may be required by employees; however, if their tasks require the use of both hands (e.g., when working on the assembly floor), they are not able to use smartphones. Wearables are particularly useful in field operations or maintenance jobs, where employees can use their hands to perform other tasks such as fixing components or machines, or working with other electricals and devices. As voice and gesture-based interfaces gain prominence, wearable computing can truly enable complete handsfree operations and data manipulation.

- **Better collaboration and communications.** Wearables are helping drive new methods of collaboration, allowing remote employees, for example, to work on projects and interact with each other as well as with digital content in new and meaningful ways. Take for instance a globally dispersed team designing cars – each of them can view the VR rendering of the prototype, discuss and manipulate it, and even see how the changes appear, all in the VR environment. Smartwatches also help employees to stay connected, share information and communicate with other teams while performing other tasks.

- **Real-time information and instructions.** Many of the use cases for wearables hinge on the capability of real-time information and instructions right in front of the user's eyes. For example, a field maintenance staff wearing smartglasses can be instructed by remote level 2 technical teams, as they can see the same machinery, and provide step-by-step instructions to troubleshoot. With smartwatches, users receive real-time notifications or instructions right at their fingertips, thus reducing the chances of missing important alerts or notifications, as may be possible in the case of mobile phones which can easily be misplaced or even missed.

- **Improved health and safety.** Specifically, for employees working in the field, on factory floors or in hazardous situations such as in mining, wearables can help improve health and safety with better remote collaboration, handsfree operations, better responsiveness to notifications and alerts, and so forth. There are also cases where employees can opt-in for corporate-sponsored fitness monitoring programs that can help them improve their overall health, or allow them to receive alerts and notifications based on their vitals monitoring. In some cases, organizations are taking it a step further and linking smartwatches to corporate health insurance programs. AR/VR technologies are also being leveraged for training purposes, such as by simulating environments that can make employees aware of potential risks and accidents, without putting them in actual

situations. Examples include driving safety training in logistics, or in the oil and gas sector where employees deal with heavy engineering components and chemicals.

- **Cost savings.** Wearables in many cases can replace the need for purpose-built hardware such as barcode readers, task-specific displays and consoles. Organizations can drive transformation programs that can help streamline operations and replace legacy hardware and systems with wearable technologies that offer much more functionalities and automation opportunities. These programs can help standardize IT operations and management, and improve productivity and upgrades, thus reducing costs.

Key Challenges for Organizations

As mobility expands beyond handheld devices such as tablets to include wearables, organizations are now coping with an increased volume and diversity of devices and applications under management, and the complexities thereof. Some of the key challenges that organizations face today with wearables include:

- **Managing device and platform diversity.** Many organizations are still struggling with the increasing mix of devices at the workplace due to BYOD policies. With the advent of wearables, the situation will be compounded. The wearables market is still in its infancy with several new products that are not necessarily enterprise grade. The market is also highly fragmented. This means there are plenty of purpose-built hardware, as well as proprietary solutions and platforms to choose from, thus increasing complexities for the IT teams that are tasked with device life-cycle, access, applications and content management.

- **Security.** Mobile devices often operate outside the secure enterprise firewalls and on-the-go, which make them more vulnerable to attacks. This is also true for many of the wearables being deployed, of which a large number may not even have enterprise-grade security features, given the infancy of the market. Thus, securing these devices remains one of the top challenges for organizations.

- **Privacy and compliance.** In most cases, organizations also collect private user data, vitals or other usage statistics of their wearable users or employees. Most markets today have stringent data privacy laws and penalties on failure to comply. The complex net of privacy and security laws is among the key concerns that organizations face when they plan to deploy wearables, especially when the deployment includes multi-country projects.

- **Managing user experience.** The diversity of devices and form factors creates many user experience challenges for organizations, such as application performance, content displays, loading or other issues around the use of native functionalities. Monitoring usage and providing consistent user experience across different devices is increasingly becoming a daunting task for organizations.

- **Process transformation and operations management.** Many wearables initiatives such as those on the factory floor or for maintenance operations require business process transformation and reengineering efforts to create new workflows, handovers and metrics. This is easier said than done as it requires significant change management, training and transition efforts. Many wearables also have issues with battery life, which may not last an entire work shift, thus adding to operations overheads or optimization issues for IT to improve battery life.

- **Technology complexity.** Wearables come in different form factors and feature different operating systems, and applications are often built on different platforms, which create integration complexities with legacy enterprise systems and applications, most of which are built for PC/laptops, or at best smartphones and tablets. Adding to this are networking, security and IT management complexities that organizations must deal with for wearables deployments.

Considering Samsung SDS EMM for Wearables

Samsung SDS offers a comprehensive EMM suite which now includes EMM for Wearables that can help reduce complexity in wearables deployments, enabling organizations to successfully deploy, manage, monitor and secure wearables.

While Samsung is mostly known for its devices such as smartphones, Gear VR headsets and smartwatches, it operates several businesses including IT software and services. Samsung SDS has been a provider of IT outsourcing, logistics and business solutions since 1985. The company offers a full suite of mobility solutions that includes hardware, software and managed services. Samsung SDS is also progressively expanding its EMM capabilities to offer unified endpoint management solutions with wearable EMM capabilities.

Some of the key constituents of the Samsung SDS Secure Mobility Suite and EMM for Wearables include:

- **Privacy and security.** As part of the Samsung Secure Mobility Suite, Samsung SDS EMM for Wearables responds to evolving enterprise security concerns by offering enterprise-grade security for Gear smartwatches. The solution enables central management of devices, app management and comprehensive security features to prevent data loss, leaks or theft.

  The key security features for Samsung are:
  - Defense against malware and viruses
  - Remote wipe of all data on lost or stolen devices
  - Prevents information leaks at an attempted factory reset
  - App Tunnel encrypts and sends data between an app and the EMM server
  - FIDO-certified biometric authentication, including voice authentication
  - Only permissioned firmware upgrades

  In addition to the above native security features, additional capabilities can be enabled utilizing the Samsung Secure Mobility Suite on a case-by-case basis:
  - SecuCamera allows for safe photography by preventing photos from being stored on the mobile device
  - Lock down feature where a device can be automatically locked and alert messages sent when the device is out of a designated area
  - Secure browser
  - Device data encryption
  - Kernel monitoring

- **Direct management of wearables.** Both BYOD and choose-your-own-device (CYOD) models are supported. In addition, Samsung Gear S3 running Tizen OS can be directly managed by Samsung SDS EMM for Wearables as an enterprise endpoint, and does not require pairing with a smartphone to deploy enterprise apps or to enforce security restrictions.

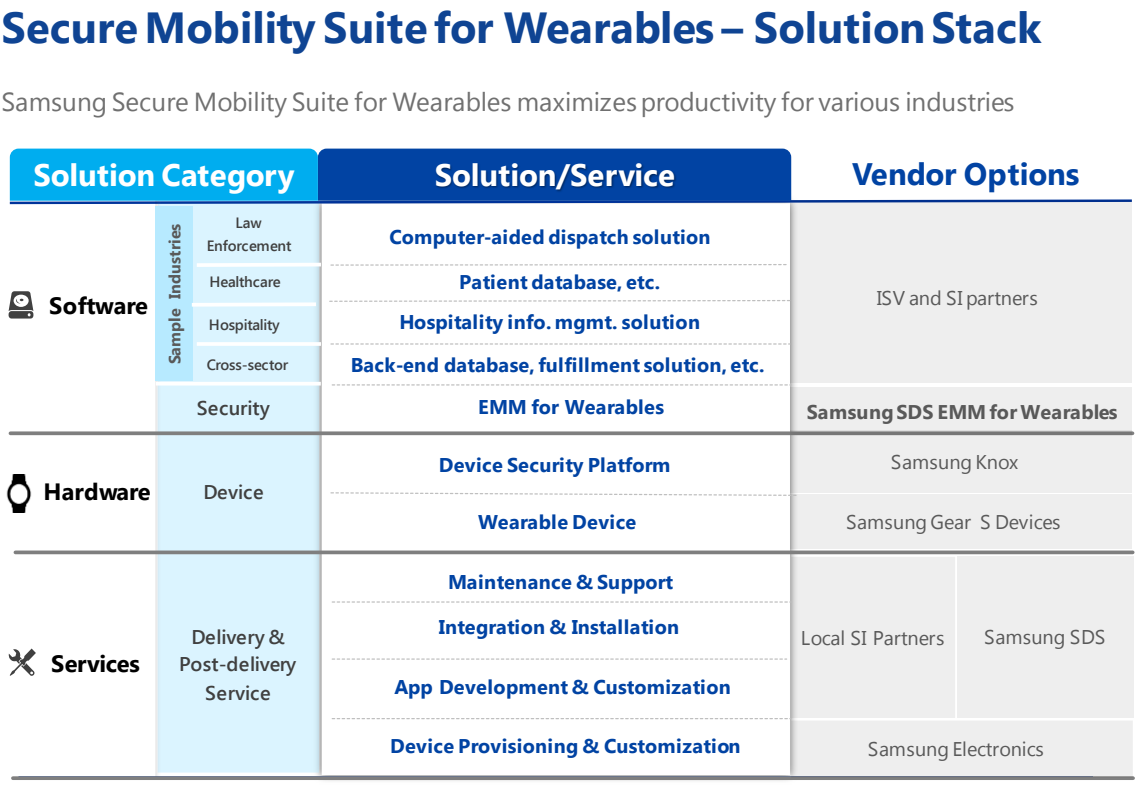
- **Application management and control.** This provides complete capabilities around application management such as allowing activation of only IT authorized business apps, batch installation and management of apps executable by an administrator through batch application of policies. In addition, Samsung SDS EMM for Wearables also helps optimize battery life, which is critical to ensure that a wearable is operational throughout the work shift without need for replacement or recharge.

- **User interface.** The solution offers an easy-to-use central IT interface as well as an individual user interface, allowing users to perform actions on wearable devices. In addition, it features a dashboard for statistics that IT or users can view.

- **Analytics.** Gear smartwatches can monitor vital signs and user behavior, allowing enterprises to collect important user data and enable real-time monitoring. This feature is only available for Samsung Gear wearables.
- **End-to-end solution and services.** Samsung SDS offers a complete end-to-end solution that includes device provisioning, system integration, application development and configuration, as well as support services. An overview of these services is listed in Figure 2.

Figure 2

Samsung SDS EMM for Wearables: End-to-End Solutions and Services



Source: Samsung SDS, 2017

Samsung SDS's comprehensive mobility solutions have several implications and potential benefits for customers.

- Provides a one-stop solution for enterprise mobility needs that includes hardware, software applications and services, thus reducing procurement and operations efforts around dealing with multiple vendors.
- Being part of the same Samsung Group enables better collaboration with the hardware teams at Samsung Electronics, which helps faster feature and capabilities development or fix integration issues with Samsung products. For example, Samsung SDS's solution is the first wearable EMM to support Tizen watches. As of version 2.0, in addition to Tizen wearables, Samsung SDS EMM also supports Android, iOS and Windows 10 devices.

- Offers both its own software and IT services that help enterprises around better license management, application integration and development support, and faster upgrades.

Customer Use Cases

Many organizations have already benefited by deploying Samsung SDS EMM for Wearables to improve productivity, provide better customer experience and even create new services and business models.

- Airport supply chain: SATS Ltd., a major ground handling services company that serves Changi Airport in Singapore, has deployed smartwatches paired with handsfree bone-conductor headsets, integrated in safety helmets for their ground handling technical ramp staff – through which employees receive work schedules and instructions in real time. The solution has helped enhance workplace safety and streamline communications. Productivity also increased by 10% in just the first two weeks of the deployment.

- Airport: At San Diego Airport in the United States, the IT department uses smartwatches powered with EMM to manage staff alerts and respond to IT issues more quickly.

- Police: A police organization in a United States metropolitan city is utilizing wearables to enable central command to gain a bird's-eye view of field staff locations, and to allow central command to send notifications and other communications for more timely and handsfree dispatches.

- Senior care: Smartwatches support elderly residents at Glencroft Senior Living, an assisted living community in the United States, by tracking their vital signs, activity and location, and sending alerts. The solution is deployed and managed by Samsung SDS along with its partner, Reemo.

- Hospitality: The Valencia Hotel Group in the United States deployed Gear smartwatches equipped with EMM and Task Watch (by Hipaax) to enable task management and real-time notification and completion updates.

In summary, Samsung SDS can not only help improve device management and security for mobile devices, but also help organizations accelerate their digital transformation journey with its holistic wearables mobility management solution and services.

Challenges and Opportunities

Although Samsung SDS has a robust wearable EMM platform, this is a rapidly changing technology area and may require constant upgrades and capability enhancements. In addition, many enterprises have already deployed EMM solutions from other vendors where Samsung SDS may meet resistance. That said, organizations that have already invested in other EMM platforms can also consider Samsung SDS EMM for Wearables as it can be easily integrated with their existing EMM solution. However, it must be noted that some of Samsung SDS's competitors are also enhancing their product capabilities to include UEM features, which it can be evaluated against.

IDC believes the greatest opportunity for Samsung SDS is in leveraging the comprehensiveness of its solution, which includes system integration, support and end-to-end transformation capabilities across different sectors. Also, the company has achieved some notable pilot clients in developed markets, including government clients, and it should focus on replicating this success in other markets and segments. Finally, leveraging the existing relationships and Samsung device enterprise deployments could be a good go-to-market strategy.

Conclusion

While wearables offer several benefits, there is no one-size-fits-all approach to success. Some of the key levers that can help enterprises run successful wearable deployments are:

- **Aligning with strategic outcomes.** Wearables offer significant benefits around productivity, cost savings and better collaboration. However, to reap these benefits, enterprises need to prioritize the use cases and focus on outcomes they wish to achieve, instead of just viewing it as another piece of technology.
- **Effective management and operations.** Additional devices can add to the management, support and operations complexity. Therefore, utilizing solutions such as Samsung SDS EMM for Wearables can help with both device management and setting up effective operations.
- **People and experience at the center.** The success of any new technology initiative in an enterprise is heavily dependent upon employee acceptance, user experience and the value it adds to empowering employees. It will not be any different for wearable computing, and enterprises should focus on user experience while deploying wearables.
- **Exploring process transformation.** Wearables also offer opportunities for process transformation and workflow automation, beyond just communications or alerts. Organizations should engage a partner or consulting firm that can help with process transformation to maximize the benefits from these deployments.
- **Securing the enterprise.** As the costs and complexity of non-compliance continue to rise, securing enterprise data and applications should remain the top priority to avoid both financial and reputational damages. Error proofing security loopholes through appropriate software and services before embarking on a wearables deployment journey is highly recommended.

IDC believes that wearable computing will continue to grow rapidly and help drive productivity, cost savings and better employee experiences, as well as create a fertile ground for automation and AI applications.

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