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The Next Frontier in Business Success
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WEARABLE TECH: THE NEXT FRONTIER IN BUSINESS SUCCESS

The “Office of the Future” is built on the notion that the workforce is increasingly mobile and the work environment itself is becoming smarter than ever. Next-generation technologies such as wearable tech and the Internet of Everything are expected to accelerate workers’ efficiency and productivity, allowing them to work and collaborate anytime, anywhere. Indeed, Frost & Sullivan predicts that the Office of the Future will drive a spectacular change in the workplace by 2020—a change that enables new styles of working alone and with others, and that connects people to one another as well as to data and analysis. The goal is to help employees focus on results, independent of their work locations, preferred devices, and job roles.

Wearable devices such as smart watches and augmented and/or virtual reality consoles will go a long way toward making this future a reality. Frost & Sullivan predicts that there will be 176.9 million wearable devices in use by 2018; a single wearable device’s traffic may equal that of seven basic feature phones by then, too. Right now, the average worker uses four devices per day; once Millennials make up 75% of the US workforce, in 2025, they will expect and demand next-generation technology to help them do their jobs—and they won’t want or need to be tied to a specific workplace environment or traditional technology tools.

Companies that want to continue to improve the customer experience need to pay attention, too; even today, 20% of customers expect a response within one hour, which means that organizations must have processes and technology in place to answer the call quickly and effectively. Over the next several years, Frost & Sullivan research shows, the customer relationship will become ever more data-driven, with consumers and business customers expecting to share relevant information in exchange for a more personalized service experience.
Wearable technology also enables companies to collect real-time information about the health and safety of their employees, their working conditions, and their work performance, including employees who are working at remote locations. This helps to drive productivity, improve safety ratings, reduce accidents, lower response times when accidents occur, and ultimately reduce healthcare costs.

These changes demand that businesses think carefully about the tools they deploy now and in the near future, so that they are ready to meet the needs of their employees, partners and customers, and so that they can achieve maximum revenues and results. Businesses are increasingly deploying unified communications applications and focusing on converging them with business processes to ensure a seamless flow of information across all business units and end users within a multi-modal and context-aware environment. Wearable technology that can access enterprise applications and data can speed decision-making, increase productivity and improve outcomes.

This paper will outline the Mega Trends that Frost & Sullivan identifies as affecting business in the years to come; explain how and why wearable technology can improve processes and generate business results; outline key use cases based on specific industries and job roles, including manufacturing, sales, hospitality, retail and in-field service and support; and offer best practices for deploying these new tools in the workplace today.

**What Disruptive Characteristics Do Wearables Have?**

![Wearable Technology Star Diagram]

**COGNIZANCE**
The ability to track daily activity will provide the wearer insight into his or her life and will lead to positive behavioral changes.

**SIXTH SENSE**
Owing to their ability to analyze vast amounts of ambient data, wearables could empower the wearer with a 'sixth sense' that deduces valuable insights from data collected.

**NON-INTRUSIVENESS**
Wearables are designed to act as an unobtrusive access point and information gateway, allowing wearers to work with both hands while remaining connected at all times.

**RE-DEFINED REALITY**
The most unique and disruptive feature of a wearable is its ability to introduce a digital layer over the physical world we inhabit. The superimposition of the virtual world over the real world will change the way we perceive, experience, and engage with reality.

**CYBORG-LIKE ABILITY**
Wearables will become a natural extension of the physical body and unique to each individual. Hence, wearables will become the ultimate authentication device, and the human body will become the password of the future.

*Source: Frost & Sullivan*

**THE INTERNET OF EVERYTHING: CHANGING HOW USERS INTERACT WITH INFORMATION**
The business world is expected to undergo an explosive change thanks to the evolution of technologies such as the Internet of Everything (IoE), wearable devices, and virtual and augmented reality. These tools will truly
enable employees to work anywhere, anytime, all the while collecting data on what they are doing and offering suggestions on how they might do it better. Companies face the challenging task of unifying these intelligent systems with their existing communication infrastructure in order to appreciate the real benefits of the digital workplace. But once they do, the payoff can be immediate and dramatic.

As members of Generation Y—also called Digital Natives or Millennials—enter the workplace, their expectations about work-life balance, communication and collaboration, and data collection and analysis will change the way work gets done. They are, by far, the most tech-savvy population yet, and their experiences growing up with technology at their fingertips—including an array of mobile devices, social media, data mining, and other tech-driven realities—promises to drive revolutionary changes in the workplace. Because of Gen Y’s ready adaptability and collaborative work culture, mobile and wearable devices augmented with relevant and contextual information will make them more productive, while also giving them the feedback and direction they’ve come to rely on from technology.

While a large number of employees are already using smart phones and tablets throughout the enterprise, wearable devices like smart watches are at their infancy when it comes to enterprise adoption. But leading-edge organizations are starting to recognize the power that such tools offer, including the hands-free collection of and access to a wide variety of corporate data, which can then be uploaded automatically to other enterprise applications and analyzed for business and personal use. Frost & Sullivan expects the wearable devices market to see significant growth in the enterprise, as companies increasingly adopt wearables like smart watches and heads-up/head-mounted displays for augmented and virtual reality. The global wearables market is expected to grow at a CAGR of 44.1% over the next four years, amounting to approximately $37 billion in 2018, but with the industry poised to witness a growth in shipment volume of about 74.4% CAGR over the same time period, the uptake of wearable devices in the enterprise segment is going to be rapid.
The Internet of Everything is Coming to a Workplace Near You

The Internet of Things (IoT) refers to the seamless connectivity among an array of endpoint devices anywhere, anytime, and is designed to achieve the goal of creating a continuously connected world. The Internet of Everything (IoE) refers to connectivity among people, processes, data, and devices to achieve a more actionable connected world. Besides receiving and analyzing data and implementing program instructions, objects embedded with transceivers can also take necessary action based on the data they gather. Wearable devices like smart watches, with embedded computing platforms to analyze information and then share it with back-office and communications systems, are a key part of this changing work environment.

The ultimate goal of IoE is to enable automation, boost productivity, and encourage high levels of social interaction among disparate employees. The convergence of emerging technologies such as Big Data and context-aware computing with IoE is expected to form the basis for secured user-access provisioning from a huge volume of information, policies and applications. The semantics and contextual linking behind the schema of IoE provide the system with the necessary intelligence to make decisions regarding the sharing of information with appropriate users. They can then act on that data in real time, improving performance immediately and over time.

WEARABLE TECH MAKES DATA MORE ACCESSIBLE TO EMPLOYEES AS SOON AS THEY NEED IT

Input devices such as speech recognition systems, object tracking systems, gesture recognition systems and smart sensors are continuously evolving to accommodate the increasingly high levels of sophistication expected from this emerging technology.

For instance, location-based services on wearable devices like smart watches augment the users’ work environment in real time and help parse context, delivering the right information at the right time to the right users, depending on where they are and what they’re doing (or supposed to be doing) at work. When integrated with back-office systems like workforce management (WFM), supply-chain management (SCM), enterprise-resource planning (ERP), and customer-relationship management (CRM) software, wearables can help employees make better decisions, speeding results and improving productivity. For instance, a worker on the production floor can get an alert when materials are running low or a large order was just placed, allowing him and his colleagues to make changes on the fly to support just-in-time production processes. The collected data can also be stored in the back-office systems for further analysis by managers and executives.

Wearable Tech Changes Everything

- One of the key differentiating factors of wearables is their ability to function hands free and in a non-intrusive manner.

- As an extension of the physical body, wearables could obviate the need for user authentication by making the human body the ultimate password.

- As people begin to track their calorie count and vitals with greater fervor, the quantification of activities will reach new levels, resulting in behavioral changes.

- As an electronic device unique to every user, wearables could become a safe payment gateway, allowing the wearer to engage in cashless transactions.
Likewise, biometric data can help employers monitor employee behavior and ensure they are acting appropriately, within the context of the business. It can feed that information back into the system, where it is analyzed and used to improve everything from employee health and well-being to facilities maintenance and staffing. Wearables can provide data to the individual and to the company about the employee health and safety, and about the working environment. This can improve safety ratings, reduce accidents and their associated costs, improve worker health and productivity, and reduce healthcare costs. These benefits are especially significant for companies in the energy, oil and gas, construction, aerospace, transportation, shipping and logistics industries.

And because they offer hands-free connectivity, wearables make it much easier for employees to leverage data while they are getting other work done. This is especially valuable for non-traditional knowledge workers, who spend most of their time on factory floors, at customer locations, in stores and restaurants, at repair bays, inside clinics and hospitals, and so on.

**Innovation Requires Preparation**

When companies have an open ecosystem, they can innovate from the edge—starting with the end user, use case and desired business benefit, rather than being limited by what their closed system supports. As a result, they can quickly capitalize on new opportunities, like wearables or virtual reality, and see results well ahead of the competition. Frost & Sullivan’s customer research shows time and again that the pace of innovation keeps IT managers and business executives chasing after technology just to keep up, rather than thinking about what they want the technology to accomplish from a strategic point of view.

To avoid getting bogged down in the day-to-day details of managing a mobile enterprise, consider outsourcing management, security and control to a third-party provider—services that leverage partner relationships to deliver bullet-proof data and device protection, comprising mobility support, enterprise mobility management (EMM) and value-added services for deployment, security, applications and device care. Managing a large variety of endpoint devices—including smart phones and tablets, wearables and VR gear—can be overwhelming for many IT organizations. By giving the job of 24/7 services and support to a trusted partner, companies can focus on the business initiatives that will truly derive value from their innovative IT investments.

Look for a solution that includes technical support for applications and devices, including regular health checks, license management and container support; EMM license management and EMM platform services; the option for 24x7 availability, as well as customer portal and remote access support; device provisioning, maintenance and upgrades; and extended repair and warranty as appropriate.

**USE CASES: KEY APPLICATIONS FOR WEARABLE DEVICES**

Wearable, tech-like smart watches are suited for almost all businesses and job roles, including desk-bound office workers who want to stay connected to people and information when they are out of the office or away from their more-traditional screens. But they are especially useful for scenarios in which employees use their hands to get work done (making it hard, if not impossible, to consistently check a smart phone, tablet or other device); and for mobile workers, for whom the location-based and biometric services can be a productivity boon. Here’s a look at some of our favorite use cases:

**Production Floor**

Employees working in a production facility often need to use their hands in order to get their work done. Although they could benefit from up-to-date information from both back-office systems and the production floor itself, they are not usually in a position to input or receive it, let alone put it to good use in real time.
With smart watches connected to corporate data, however, these line workers and managers can easily be alerted to production changes, including order updates, materials shortfalls or overages, and new policies and procedures. At the same time, managers can tap the information being constantly loaded into the system to track productivity, identify disruptions and quickly handle problems almost before they arise. And all employees can use the devices as biometric scanners, effectively granting password-protected access to sensitive areas on site.

Wearables also make it easy for employees and their employers to track workforce management, serving as a virtual time card. And by leveraging location-based services, managers can see exactly where every employee is every minute of the work day, allowing them to monitor breaks and other gaps in productivity, as well as note needed staffing changes based on real-time information. Meanwhile, biometric data can indicate when a line worker is stressed, overheated, unusually tired, or otherwise in need of rest or care; and help facilities managers adjust conditions in the workplace itself, such as thermostat settings, pollution levels, and so on.

### Three Ways to Alter Reality in the Workplace

**Wearable Device-Based Augmented Reality** refers to devices like heads-up displays (HUD), head-mounted displays (HMD), AR-enabled contact lenses, and other accessories. For example, pilots can use these devices to train on new airplanes, or adjust to new policies and procedures on older models.

**Mobile Augmented Reality** has been developed in convergence with mobile computing and is widely used in conjunction with GPS systems in location-based services and RFID tags. For example, apps can direct manufacturing employees to materials based on RFID tags in a warehouse.

**Spatial Augmented Reality** brings real-time projections into the user’s field of vision, allowing users to touch the projected image. For example, a medical simulation tool can be used to project patient diseases on manikins for training and practice in advance of real-life procedures.

### Retail and Hospitality

Store clerks, restaurant workers and hotel employees are rarely able to check into a corporate data system unless they have access to a mobile device. While smart phones and tablets have a role to play in these environments, many retail and hospitality workers need to use their hands on the job—to fold clothes, check-out buyers or check-in guests, cook and serve food, clean rooms, and so on.

Wearables let these employees get the information they need when they need it, without interrupting their workday. Using speech-to-text capabilities, retail clerks can update inventory right from the store floor; cooks can place orders for more food or wine, and guest services staff can get directions or research entertainment recommendations for guests. Location-based information lets managers see where every employee is within the store, restaurant or hotel, making staffing and personnel deployment more timely and efficient. And biometric data—pulled directly from the employees themselves, with no effort on their parts—makes it easy for employers to monitor working conditions to ensure a comfortable experience for guests and employees alike.

Meanwhile, it won’t be long before wearables can act as payment devices; all a customer will need to do is wave his watch at a reader at check out—or even have it register as he leaves the store through special gates that read the RFID tags on the merchandise he has selected, then charge payment automatically via his smart watch or other wearable device.
Sales Warriors

Always on the go, successful salespeople don’t have the time to worry about manually updating data, and they need information immediately, not after a lengthy search on a separate device. Sales professionals who spend 80-100% of their time on the road know the frustrations that come with mobility; the biggest one may be the lack of access to information that can help them close a deal.

Wearable technology can eliminate that by making it easy and painless for road warriors to see and use product data, sales targets and status, qualified leads, and complete CRM profiles. Connecting a smart watch to a Bluetooth headset allows a salesperson to call a manager on the fly to get any necessary approvals in real time, or use email and messaging apps for follow-up and critical communication. And because wearables can connect into enterprise apps like CRM and contact center software, every interaction can be automatically loaded into the corporate database for future use and manager review.

Meanwhile, smart watches can leverage GPS and other location-based services to ease travel headaches, locate directions to client sites or dinner meetings, and give management a clear picture of how and where their sales force is deployed.

By 2025

Millennials will make up 75% of the U.S. workforce. They will expect and demand next-generation technology to help do their jobs. They will not want or need to be tied to a specific workplace environment or traditional tech tools.

In-Field Service and Support

Technicians working on repairs—on automobiles, airplanes, heavy machinery, appliances, HVAC, computers, and so on—need both hands free to get the job done. But they also need ready access to product data, maintenance histories, instruction manuals, and customer accounts. Wearable devices give them that, without forcing them to take their eyes and hands off their work. And by connecting into corporate databases and applications, devices like smart watches update back-office systems automatically, allowing other technicians and their managers to see what was done and what they might need to do next.
Because they often have to travel to their worksite, field support personnel need quick and easy information on travel, directions, and so on—and wearable devices can give them that, thanks to GPS and other location-based services that call up addresses and routing information in real time. The same technology allows managers and dispatchers to get a clear, real-time picture of where field-techs are located, allowing them to schedule customer calls in the most efficient way possible, and ensuring that workers are as productive as possible while on the clock. Robust health and safety benefits would apply here, too.

**Education**

One of the biggest challenges schools face is attendance and accountability. In K-12 schools, making sure kids are in class, on time, when they should be can be a manual and cumbersome task. Once attendance is taken at the start of the day—or even each class—it then needs to be conveyed to the office, which then must contact parents of missing or absent students. Smart watches and other wearable tech can help keep track of where everyone is, then immediately send that data to a central application, which, in turn, can automatically contact parents via voice calls, email or text.

Likewise, colleges and universities are looking for ways to help their students graduate in four years with the skills and education they need to succeed in the real world. By using the data collected through wearable devices, professors and advisors can see whether students are attending class, how much time they spend on homework, how and when they access research and other information, whether they work outside of school (and how much time that takes), and where they spend their free time. They can also leverage biometric information to keep tabs on student health, allowing them to intervene early if a student appears to be getting sick, overtired, or just run down.

Universities also have programs to keep students safe in case of criminal or terrorist activity on campus, or a weather or natural disaster threat. Wearables will be useful for getting safety information to students and to track where they are in case of emergency. Meanwhile, students themselves are using the devices to conduct research, update and download data for classes and labs, contact friends and family, and balance work, studies and free time.

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**Leadership requires that executives and managers cultivate the right kind of innovation for their business. Think about what you want to accomplish and what business outcomes you are trying to achieve, then tap the right resources to bring it to life.**

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**WHAT TO LOOK FOR IN AN ENTERPRISE-READY WEARABLE DEVICE**

Wearable devices and augmented- and virtual-reality endpoints are often made for the consumer market first, and then make their way into the enterprise whether via BYOD (Bring Your Own Device, a trend in which employees use their personal tech at work) or IT deployments. But some vendors are starting to make wearables that can satisfy enterprise needs and requirements.
The new Samsung Gear S™ is the company’s first 3G-connected wearable device, designed to keep users connected even when they don’t have their phones or other mobile devices. Employees can use the smart watch to manage calls and email, search for information, and access enterprise applications from anywhere. The Samsung Gear S is the next big way to stay connected to your business. The display is optimized for reading and typing; voice-activated maps feature turn-by-turn navigation; and fitness features let users monitor their heart rate, and track their sleep, exercise and even their steps throughout the day, promoting a healthier workforce.

A truly flexible approach needs to support all device types, manufacturers, operating systems and platforms to make connections easier. Cultivating an open ecosystem is critical for success for any mobile-focused business—especially if they are interested in incorporating wearable technology. Doing so requires enabling connections and collaboration, as well as access to back-office data, services and applications. Seamless integration across devices, people and content is a must.

Luckily, this does not mean leading-edge organizations need to overhaul their entire architecture to support wearable devices. A flexible approach should let you derive value from your existing technology by focusing on creating connections in the most impactful areas of your business.

The most important criteria to look for in a wearable device is a manufacturer that understands the needs of business. The vendor should offer not just leading-edge device technology, but also services and support for everything from connectivity, network health, device and application management, to integration with your legacy infrastructure and applications.
Virtual is the New Reality

Through a partnership with Oculus Rift, Samsung introduced the Gear VR to create a new way for users to experience content. To give users an immersive 360-degree experience, Samsung’s Galaxy Note 4 fits into the VR device and plays content to create a virtual reality experience. The technology can be used for a variety of enterprise use cases, including:

- Letting customers see a real-life view of their experience; for instance, a real estate agent can offer virtual tours of featured properties.
- Providing employees with realistic training simulations; for instance, a transportation company could use it to train new drivers or pilots.
- Offering a full 360-degree view of video images; for instance, doctors can see life-like PET or CT scans.
- Securely viewing content while eliminating distractions from your surroundings while you travel; for instance, salespeople can use it discretely on airplanes or hotel lobbies.
- Creating an interactive learning environment in the classroom; for instance, schools can offer more realistic, engaging educational experiences.

CONCLUSION

As the workplace becomes increasingly connected, managers are looking for ways to collect data from their employees, and then use that information to drive actions and boost productivity. Smart companies are transitioning from a traditional, silo-based organizational structure to a more collaborative, integrated model. Advances in technology and ecosystem convergence, collaboration and partnerships among stakeholders from different industries, such as energy and infrastructure, IT, telecoms and government, will expedite the delivery of integrated services.

Companies will increasingly rely on Big Data by collecting, analyzing and monitoring information in real time. Wearables will allow workers and their companies to collect real-time information about employees’ health, safety, location and performance. This can be valuable data for scheduling work, maintaining safety ratings, reducing health care costs, and optimizing operations; it will also encourage open data platforms and crowd-sharing to boost innovation and positively impact the bottom line.

To get the most out of all this information, businesses are deploying wearable technologies to make it easy for employees to access and update data in real time, without having to stop doing the work at hand. Companies interested in leading the way with wearables should make sure they have a clear plan and goals in place, and that they partner with a provider than understands the business market and can service and support end users from day one, with a strong focus on integration, management and security.
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