Tractica

Enterprise Wearable Technology Case Studies

30 Profiles of Wearable Applications in Automotive, Corporate Wellness and Insurance, Field Services, Food, Medical and Healthcare, Logistics and Distribution, Manufacturing, Mining, Oil, and Gas, Retail and Marketing, and Travel, Transportation, and Hospitality

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SECTION 1

INTRODUCTION

This is the second edition of Tractica's enterprise wearable case studies white paper, published in partnership with the Enterprise Wearable Technology Summit East. The first edition of the white paper was published in 3Q 2015, highlighting 40 case studies across the spectrum of enterprise markets, including automotive, manufacturing, healthcare and medical, logistics, field services, retail, construction, and many more. In this edition, Tractica provides an updated list of case studies with additional industry verticals like transport and food, as well as a more diverse range of wearable devices.

While the 2015 paper saw Google Glass as the dominant wearable being used within the enterprise, this year sees a much more varied range with devices like a wearable exoskeleton chair, wearable cameras, smart watches, medical body sensors, mixed reality (MR) glasses, smart helmets, smart headsets, and location trackers. The market is going into a quieter phase, with many of the trials now converting to full-scale deployments. However, the enterprise interest in wearables has only grown stronger in the last year, with areas like healthcare and manufacturing seeing a large amount of activity, and with corporate wellness programs growing beyond self-funded insurance providers to small and medium enterprises that use third party insurance.

Within this white paper, Tractica aims to present a diverse range of case studies for enterprise wearables, classified by vertical market, to provide a flavor for the level of enterprise wearable activity that is currently taking place and the opportunities that it is creating for the future. Overall, Tractica forecasts that the market for enterprise wearable devices, which includes industrial and healthcare wearables, will grow from $267 million in 2015 to $31 billion by 2021, representing a compound annual growth rate (CAGR) of 121%.

SECTION 2

CASE STUDIES

2.1 AUTOMOTIVE

2.1.1 AUDI, DAIMLER, AND BMW

Noonee, a Swiss startup based in Zurich, and a spinoff of ETH Zurich, has developed the Chairless Chair, a wearable mechatronic system that allows people to essentially sit anywhere. The chair is an attachment that is strapped onto the user's body, something that you can walk or run with, and a hybrid between an exoskeleton and a wearable technology. When you want to sit, push a button and sit back in the desired pose, at which point the portable variable damper kicks in and holds the body weight, reducing stress to the leg muscles and joints. The body weight is directed to the shoe heels, which are attached to the Chairless Chair, so that it does not touch the ground directly.

The Chairless Chair is being trialed initially at Audi and BMW to help their workers reduce strain and workplace injuries due to standing too long or working in awkward positions. Usually, workers do not get to sit or rest their lower limbs during long hours of work on the assembly line, so the Chairless Chair is designed to support the body weight for small durations, rather than continuously taking weight for long durations. Also, on automobile assembly floors, there is little room to provide separate benches or chairs; therefore, the Chairless Chair works well as a strapped-on wearable that one can carry on their body. Future versions of the chair are meant to detect the intention of the user automatically, rather than the user having to push a button to sit down.

Figure 2.1   Noonee Chairless Chair

(Source: Noonee)

2.1.2 VOLVO

Volvo is the first car manufacturer to partner with Microsoft to use its new HoloLens mixed reality glasses. The first use case of HoloLens is in a Volvo car showroom to aid customers with buying cars, revealing the inner working details, but also understanding some of the safety features and sensor technologies that go into a car. Volvo has taken the custom visualization of a car, from the color to the trim and from the typical 2D models that you see

on a computer screen to using mixed reality 3D holograms, which greatly enhance the customer experience. Volvo has shown prototypes of its HoloLens-equipped showroom at Microsoft's headquarters campus, but is working on launching this commercially in the near future. Volvo also sees the applicability of HoloLens technology in other areas of operations, such as on the manufacturing assembly line, helping workers carry out their tasks much more efficiently, and in the design lab, helping designers visualize and create new car designs using holograms.

Figure 2.2   *Volvo HoloLens Pilot*

(Source: Volvo)

2.1.3   DAIMLER

Daimler is using Vuzix M100 smart glasses on the assembly line to perform quality control inspections using quality assurance software specially designed by Ubimax. Assembly line workers can get rid of paper checklists and do not have to rely on memory, as they are now able to view checklists on their glasses. When a worker detects a problem, they can take a photograph directly from the smart glasses or do a voice recording to explain the issue. The incident can then be forwarded on to other workers without leaving the assembly line or filing a separate report, as the data and information is automatically logged and stored in the workflow.

2.2   CONSTRUCTION

2.2.1   SCOTLAND TRANSERV

Scotland TranServ is a road maintenance company based in southwest Scotland. Scotland TranServ is trialing a wearable wristband that measures the amount of hand-arm vibration (HAV) that drill operators experience while working with power tools. HAV-related disabilities are caused by using drilling equipment or power tools operated at high levels and over extended periods of time. The most common disease due to HAV is known as vibration white

finger syndrome, which can cause numbness of the fingers, with fingers changing color, or even losing dexterity of the hands, fingers, and arms. In the United Kingdom, 2 million people are at risk of having a HAV-related disease, with the cost to U.K. employers being £1.3 billion in claims expenses. There is no known cure for HAV-related disabilities, therefore, prevention is crucial.

Figure 2.3   HAVWEAR Wearable Band Solution

(Source: Reactec)

The HAVWEAR solution from Reactec is the first of its kind to provide constant monitoring and automated reporting of HAV exposure and risk. Each operator has a personalized radio frequency identification (RFID) card that contains their personalized thresholds to which they can be exposed, with the RFID card allowing them to sign out a HAVWEAR band at the beginning of their shift. Upon wearing the HAVWEAR band, the operator needs to press a button and hold the band next to the respective power tool that they are planning to use, which tells them the amount of time and the amount of exposure levels that are considered safe. At the end of the shift, the HAVWEAR band can transmit all the exposure level data to an online portal, which allows employers to track and manage each individual employee's HAV exposure, identifying operators that are at risk and being able to take preventive action.

2.3   CORPORATE WELLNESS AND INSURANCE

2.3.1   TARGET

Target is offering free or discounted Fitbit trackers (depending on the model) to all of its 300,000 employees to encourage a healthy lifestyle and lower healthcare costs. Target is one of the largest corporate wellness customers of Fitbit, which is reported to have added more than 1,000 companies to its corporate wellness program in 2015. During the fall of 2015, employees were organized into teams, with the team that averages the highest daily steps for a month winning $1 million, which will be donated to local charities of their choice.

2.3.2 UNITEDHEALTHCARE

UnitedHealthcare has launched a corporate wellness program called Motion targeted at companies that want to promote health and wellness among their employees. As part of the program, wearable devices can be purchased at no additional charge and employees can earn up to $1,460 per year if they meet certain goals for achieving a total number of daily steps. Employers can also earn savings on insurance premiums, depending on the combined results of the participants. Qualcomm Life is a key technology partner of UnitedHealthcare in this initiative, providing its 2net platform for medical-grade connectivity. The plan has been launched in 13 states across the United States and is expected to add more states in 2016. The plan is initially available to small and medium companies that have between 101 and 300 employees. Both employees and spouses can take advantage of the wearable devices, which are meant to tabulate total steps, frequency, and the intensity of steps, rather than just tracking total number of steps.

2.3.3 DISCOVERY HEALTH AND VITALITY

Discovery Health is one of the largest health insurers in South Africa. Discovery Health is part of the Discovery group, a financial services company that offers insurance and asset management. Discovery has a number of health insurance subsidiaries across the world, including the United Kingdom and the United States. Vitality is also part of the Discovery group and is a wellness program through which members earn points for healthy living and eating, which they can spend in various ways. In December 2015, Vitality started to offer a program in South Africa whereby members could get an Apple Watch by being more active. Essentially, members can purchase an Apple Watch through Vitality using their Discovery card, and then offset the payments by achieving their monthly goals. The same scheme is being launched in the United States in 2016, starting with three employers: AmGen Inc., DaVita Healthcare Partners, and Lockton Companies. Vitality has had 17,000 members sign up for the Apple Watch offer in South Africa over a span of 3 to 4 months and that success has prompted it to launch the program in the United States.

2.3.4 MLC LIMITED

MLC Limited, an Australian life insurance company, is one of the first of its kind to offer wearable technology to its customers, track their habits, and reward customers for living healthier lives. In a pilot program at the end of 2015, MLC offered 1,500 of its customers an Intel Basis Peak smart watch that measures a user's heart rate, sleep patterns, and physical activity. In partnership with Big Cloud Analytics, it will track and store the data collected in the cloud and perform analytics. Customers selected for the pilot were identified as being "relatively healthy" and if their lifestyle and health appears to improve over 90 to 160 days, customers will be offered a discount of between 5% and 10% on their life insurance premium payments.

2.4 FIELD SERVICES

2.4.1 NTT DATA CORPORATION

In August 2015, NTT DATA, a Japanese telecommunications and information technology (IT) systems integrator, launched a pilot program using Vuzix M-100 smart glasses for remote site maintenance. During the pilot, a senior engineer was able to remotely monitor work being carried out by using the onsite technician's point of view (POV). The senior engineer also had an overlaid augmented reality (AR) marker that could be seen on the remote technician's POV. In addition, the technician had access to a user manual on his smart glasses, keeping him hands-free to perform other tasks. Other features included recording voice memos or taking hands-free pictures. After a successful pilot, the system

was officially launched at the end of August 2015 in Japan. NTT DATA hopes to save on personnel costs, requiring fewer technicians on site and achieving improvements in worker productivity. NTT DATA plans to expand the program to its services internationally in China, India, North America, and Europe. NTT DATA also planned to start selling the full remote maintenance system to third-party customers by the end of March 2016.

2.4.2 METSO CORPORATION

Metso Corporation is a Finnish company providing technology and services in the area of mining, oil and gas, pulp, paper, and power generation. Using the Vuzix M-100 smart glasses solution, Metso has built a prototype solution for remote maintenance and servicing. A remote technician can access task lists on a cloud server, pull in sensor data, and put together a chart with live trend data. The smart glasses can also use hand gestures to look up a phone directory to place a video call for technical support using the camera for live feed. As a concept, Metso is hoping to expand functionality of smart glasses in a field services context by also providing step-by-step navigation indoors, which will guide the technician to the machine or problem that requires servicing at a facility.

2.4.3 HEWLETT PACKARD

Hewlett Packard (HP) MyRoom Assist is a software solution provided by HP that is aimed at resolving hardware or software issues remotely, using the help of specialists that can view and troubleshoot customer problems in real time. An add-on to MyRoom Assist is the MyRoom Visual Remote Guidance (VRG) that uses wearable technology like Google Glass, ChipSip SiMe, or Vuzix M100 smart glasses to provide a first-person view of the issue on site. The field person wearing the glasses is able to operate in hands-free mode and can use guided resolution. HP is using the solution with its own customers, providing assistance in repairing problems with their enterprise-grade printer solutions.

Figure 2.4   HP MyRoom Virtual Assist Using Google Glass
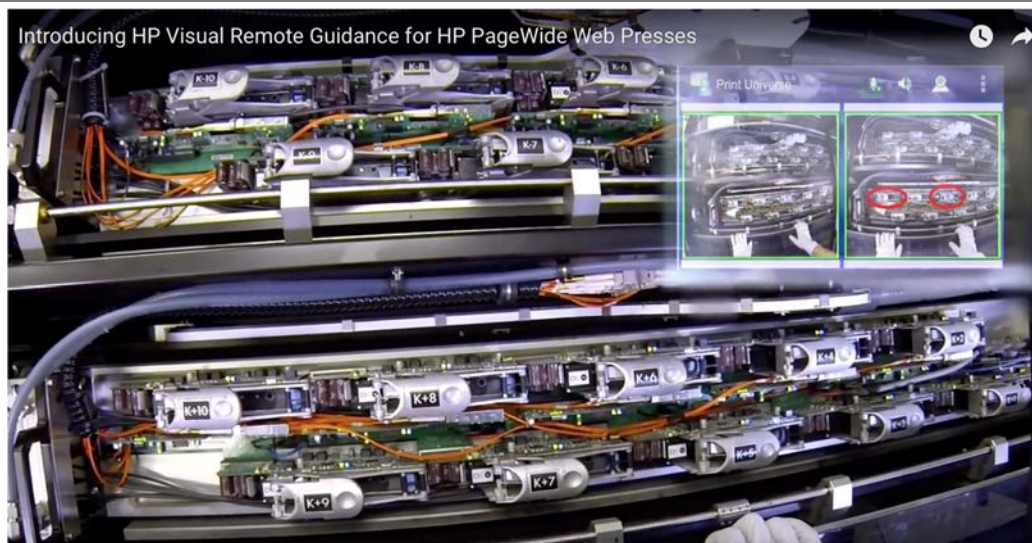
(Source: HP)

Traditionally, customers have used the phone for assistance with printer issues, but with VRG, customers can put on a Google Glass and say "Ok Google, call HP Support," which will automatically place a call to the HP assist team. Once the call is connected, the HP

support team can see what the customer is seeing and guide them step by step, using cursors that are displayed on the smart glasses screen. During the 2015 pilot, HP noticed an 80% reduction in time to respond. Another metric that showed an improvement was in the time taken to achieve a common understanding of the problem, due to the smart glasses solution. Time taken to isolate the issue was another metric where HP saw a big improvement, with the glasses helping the technicians find resolutions faster. Since September 2015, the solution has been live and rolling out to a larger group of customers.

2.5 FOOD INDUSTRY

2.5.1 PIZZA PIZZA AND DOMINO'S PIZZA

Pizza Pizza, a Canadian pizza restaurant chain, became one of the first restaurants in the world to launch a pizza ordering service on the Apple Watch. The app was launched in conjunction with the Apple Watch introduction in March 2015. It used app development firm Plastic Mobile to extend its mobile application to the Apple Watch device, retaining the majority of functions. The functionality included quick menu browsing, pizza ordering and payment, delivery tracking, recent orders and favorites, and checking one's gift card balance.

Figure 2.5   *Pizza Pizza Apple Watch Application*

(Source: Plastic Mobile)

Domino's Pizza followed suit in 2016 and launched its first pizza ordering app on the Apple Watch, with deployment currently limited to the United States. The app is targeted at Domino's customers who already have a "Pizza Profile" and have saved an "Easy Order" ahead of time. There is also a tracker that allows one to check on the order. The app is designed to be easy to use, requiring minimal interactions, and provides a glimpse of how food companies are using wearable technology to reduce the steps required for a customer to order food.

2.6 MEDICAL AND HEALTHCARE

2.6.1 EPIC AND NEBRASKA MEDICINE

Epic is an electronics health records (EHR) and software solutions company that supports electronic health data for many U.S. hospitals, among them Nebraska Medicine in Omaha, Nebraska. Both have partnered to launch an Apple Watch solution that allows registered patients of Nebraska Medicine to receive alerts about doctors' appointments, new test results, billing statements, and medication reminders. A number of privacy and security

measures have been taken, including encrypting the data from the Epic cloud server to the wearable device.

Additional updates are planned for the app, which will be integrated with other hospitals in the near future. These updates include diabetic patients receiving gentle "taps" on the wrist to test their blood sugar, or having care organizations use the watch on patients to help them gain quicker access to high-demand specialists and appointments. Epic's Fast Pass On the Go is another feature that allows any patient with an appointment 3 weeks out to receive an Apple Watch alert if an earlier timeslot opens up, allowing them to accept the appointment with one tap.

Epic also has another Apple Watch app for doctors who use Epic's Haiku mobile app on the iPhone. They can view their schedules, hospitalized patients, and clinical summaries on the watch. Doctors can also dictate a voice-based clinical note, using Siri's speech-to-text functionality, or send a message to a patient.

2.6.2 CAROLINAS HEALTHCARE SYSTEM

Carolinas HealthCare, a leading healthcare provider in North and South Carolina, announced the availability of its new MyCarolinas Tracker mobile app that connects the healthcare provider with the health data being collected on the patient's phone or other wearable device that is tethered to the phone like a fitness tracker or smart watch. The app is the first of its kind from a healthcare provider that supports more than 70 devices, including smart watches, fitness trackers, blood pressure cuffs, glucometers, scales, and heart rate monitors. The value of the application is being able to gather the data from these various devices and producing insights around monitoring daily activity, weight, nutrition, blood pressure, sleep patterns, mood, blood sugar, and more. The app collects the data, provides the patient with clinical context, and connects them to care providers. Between doctor's visits, the care managers can also monitor a patient, allowing them to make decisions about issues that need attention.

Figure 2.6   Carolinas HealthCare – MyCarolinas Tracker App
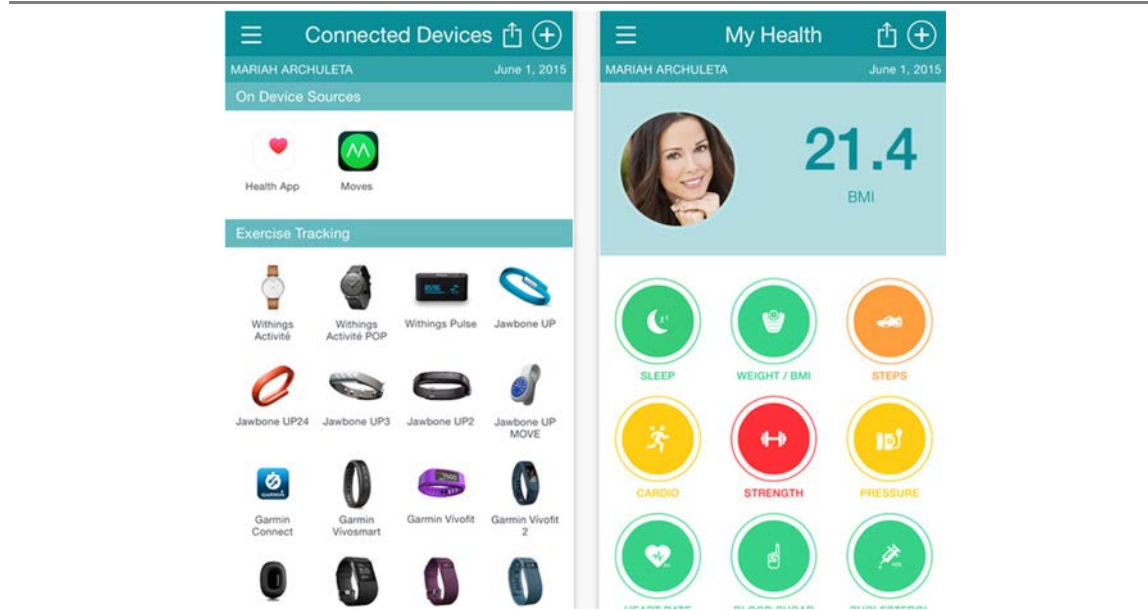
(Source: Carolinas HealthCare)

2.6.3 OSCHNER HEALTH SYSTEM

Oschner Health is a nonprofit healthcare provider based in southeast Louisiana. Oschner Health became one of the first Epic EHR systems to integrate with the Apple HealthKit platform. As a result, patients using Apple HealthKit can now submit their data to the Oschner EHR platform. Oschner also piloted an Apple Watch study in which patients suffering from chronic diseases like hypertension were able to be monitored remotely in real time, allowing specialized pharmacists to make any drug adjustments or suggest lifestyle recommendations. Patients also have immediate access to their data through the MyOschner portal. Through the Apple Watch app, patients can also receive medication reminders, including actual pictures of the pill, feedback from clinicians about potential side effects, and renewal notifications for prescriptions, along with exercise reminders. One patient enrolled in the program was very positive about the technology and thought that the Apple Watch would be like a "buddy" that encourages and nudges you to make active changes in your life to better control your blood pressure.

2.6.4 YALE-NEW HAVEN HOSPITAL SYSTEM

Dr. Adam Mayerson, an endocrinologist at the Yale-New Haven Hospital System, has been prescribing wearable glucose monitors and insulin pumps to his diabetes patients. Diabetic patients carry a device that measures their blood insulin levels every 5 minutes and provides updates on whether insulin levels have increased or decreased. Dr. Mayerson is also able to download 3 months' worth of historic data to see insulin trends. This has provided Dr. Mayerson context on the patient, and may reduce or eliminate having to wait for blood test results. In addition to the glucose meters, Dr. Mayerson also asks his patients to use wearable insulin pumps that can deliver a constant amount of insulin throughout the day, rather than having the patient rely on self-delivered injections. Overall, patients have reported feeling much more in control of their diabetes and safer doing activities like driving or parenting, as they receive immediate feedback on their actions.

2.6.5 CASE WESTERN RESERVE UNIVERSITY

Case Western Reserve is one of the first universities to have used Microsoft HoloLens for medical education. Traditionally, in subjects like anatomy, students must dissect cadavers to understand the intricacies of a human body. This practical knowledge is supplemented with 2D illustrations, relying on a person's imagination to put the illustrations in the context of the cadavers, which can often be very confusing and a messy affair. Using the Microsoft HoloLens headset, students can see the complete body and its inner workings as a 3D hologram. They can also take parts in or out, and see the arterial and venal systems functioning as they are supposed to. Microsoft, Case Western Reserve University, and the Cleveland Clinic are working in partnership to extend the possibilities and create a curriculum based on HoloLens technology. As a part of the curriculum, subjects like anatomy can be taught in groups with multiple students wearing the headset and interacting with the same 3D hologram, such as a human body, and interact with it using air gestures. This is expected to bring a paradigm shift in education, with medical education being one of the first areas to see the benefits of smart glasses technology.

Figure 2.7   HoloLens and Case Western Reserve University Medical Education Application
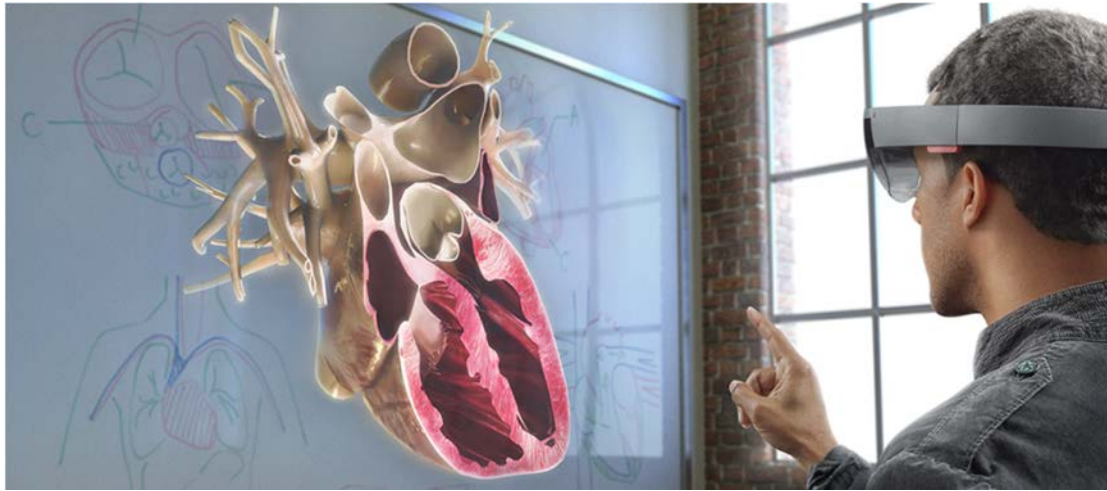
(Source: Case Western Reserve University, Microsoft)

2.6.6 MATRIX MEDICAL NETWORK

Matrix Medical is an in-home care service provider that wanted to protect its 500 in-home care personnel as they carry out their duties. In-home healthcare workers are four times more likely to be a victim of violent crime than are workers of any other industry. As a result, Matrix has been using a wearable solution from AlertGPS, which provides real-time location using global positioning system (GPS) and cellular connectivity, but also has an emergency button that can instantly alert emergency personnel and let them know their precise location, which can reduce response time in the case of an emergency. There are additional features, such as predator alerts, which alert the worker in case they are working near the home of a registered sex offender. Also, if an employee leaves a designated safe zone, an alert will be raised. Abduction or incapacitation are unfortunate risks of the job; therefore, a wearable locator/alert device could be critical. Mass notifications can also be sent to all staff in the case of a weather emergency, a terrorist attack, or any other public safety threat.

2.7 LOGISTICS AND DISTRIBUTION

2.7.1 BECHTLE

Bechtle, Germany's largest business-to-business (B2B) IT service provider with more than 66 warehouses, has become the first live customer of the Vuzix and SAP mobile AR Warehouse Picker application for smart glasses. Bechtle, SAP, and Vuzix have been working together on using smart glasses technologies in pilots since 2014, with 2016 being the year when the project has gone commercially live at Bechtle's warehouse facility in Neckarsulm in Germany. The wearable technology used is Vuzix's M-100 smart glasses solution, which communicates with Bechtle's digital warehouse management system and the SAP mobile AR Warehouse Picker app. The solution directs the wearer through a step-by-step process for a picking operation, with additional barcode/quick response (QR) code scanning and voice recognition capabilities available. The solution is able to check for low stock, so that an adequate amount of inventory is picked. The application has been focused on picking small parts, but in the future, this could be extended to other departments for receiving or managing complex delivery orders.

2.8 MANUFACTURING

2.8.1 KAZAKHSTAN SEAMLESS PIPE (KSP) STEEL

Kazakhstan Seamless Pipe (KSP) Steel is a manufacturing company based in Pavlodar, Kazakhstan, making seamless pipes for the oil and gas sector. DAQRI, maker of smart AR helmet solutions, developed a proof of concept for KSP Steel that enabled shop floor workers to access control room-level data points on their headsets. The solution was developed by DAQRI, working closely with KSP Steel's leadership team that oversees production to better understand the steel production process, operational challenges, and worker pain points. DAQRI focused on the Hot Rolling Mill line, a set of computerized machinery that can produce up to 110 tons of seamless pipe each hour, with more than 23,000 unique data points covering production information, machine health, operation safety parameters, and others. The DAQRI headset provided data visualization and control room-level data to the shop floor workers, reducing trips that they would have to make to the control room. As a result, there were improved efficiency gains, which would ultimately result in improved uptime and reduced occurrences of unscheduled maintenance.

2.8.2 HYPERLOOP

The Hyperloop project currently under development is building a superfast transportation system using pressurized capsules that travel on a cushion of air. Hyperloop plans to drastically cut the time of travel between cities, with travel between Los Angeles and San Francisco, which is a distance of nearly 400 miles, reduced to 30 minutes. Hyperloop is currently building a test track in California. DAQRI developed a proof of concept solution for Hyperloop specifically for an operator who works with a robotic spot welding robot. The remote expert was able to relay instructions to the novice worker using audio and AR marking cues. Using a wearable device like a DAQRI, it was shown that Hyperloop can save on personnel costs by centralizing their expertise and having less-experienced workers on site, enabling massive cost savings, while keeping up productivity and rapidly training new staff.

Figure 2.8   DAQRI Hyperloop Pilot Using Smart Helmets

(Source: Plastic Mobile)

2.9 MINING, OIL, AND GAS

2.9.1 RIO TINTO, ANGLO AMERICAN, NEWCREST MINING

Mining companies in Australia, including Rio Tinto, Anglo American, and Newcrest Mining, have all been using a SmartCap solution that monitors the brainwaves of their employees in the field to measure fatigue, with the goal of reducing workplace accidents. The technology has largely been used on truck drivers and machinery operators who suffer from fatigue-related injuries. The SmartCap uses EEG and proprietary algorithms to calculate a risk assessment number, which is a measurement of one's ability to resist sleep. The SmartCap provides an early warning when a driver is approaching microsleep. At Rio Tinto, truck drivers who use the SmartCap are required to discuss a fatigue management plan with their supervisors, if they are found to have high levels of fatigue. SmartCap has clocked more than 1 million hours of use, with companies around the world using the solution. The data gathered has helped mining companies better understand the dynamics of fatigue and has led to better workplace designs. For example, they discovered that the first night shift after a break is most likely to produce fatigue, as workers transition from day to night work. Also, the type of road was identified as a factor influencing fatigue, forcing designers to think about driver fatigue when designing roads and road signs. There has been a mixed response to the SmartCap, with workers in some Australian companies rejecting the introduction of the SmartCap over concerns about the information gathered being used for disciplinary reasons.

2.10 RETAIL AND MARKETING

2.10.1 HUGGIES

Huggies, the disposable diaper brand owned by Kimberly-Clark Corporation, launched a pilot project in South Korea that used wearable cameras as a marketing and promotional tool. During the pilot, a group of 10 mothers was provided with a pair of wearable cameras that could record videos of interactive moments between babies and parents. The cameras, called Moment Cams, recorded special intimate moments that moms and dads shared with their child. The cameras had proximity sensors that would trigger recording as soon as they came within a distance of 2 meters of each other. Upon pressing a red button on the camera, the video would be stored online. In the end, Huggies provided the parents with a video that stitched the two views together, one providing the baby's view and the other providing the parent's view.

The pilot was deemed successful as the videos went viral, providing a marketing boost for the brand and helping build deeper relationships with their customers. As a result, Kimberly-Clark is planning to conduct larger-scale promotions with the cameras. The cameras were custom built for Kimberly-Clark by British product design firm Kinneir Dufort, and were developed as low-cost hardware devices that could be distributed as free promotional items.

Figure 2.9   Huggies Wearable Camera Promotion

(Source: Kimberly-Clark, YouTube)

2.10.2   AMARI SUPERCARS

Amari Supercars is a U.K.-based luxury, high-performance supercar dealership that has been using smart glasses technology to help convert its website visits to actual sales. Amari is using a technology solution developed by GoInStore, which specializes in omnichannel retail using head-mounted wearables. GoInStore has partnered with smart glasses vendors like Epson to connect its specialist in-store assistants to online customers. Using smart glasses, an Amari sales specialist can provide a first-person view of the car to a customer through the company's online portal and have any questions answered in real time. With this technology, Amari has been able to sell cars through its website to customers as far away as Dubai, without the customer ever visiting its showroom.

Figure 2.10   Amari Supercars Using GoInStore Smart Glasses Solution for Omnichannel Retail

(Source: Amari Supercars, GoInStore)

2.10.3   HEAL'S

Heal's is a London-based interiors and furniture retailer that is also using GoInStore technology to bridge the gap between online and brick and mortar retail. Online customers who are interested in a more personalized and in-depth view of products have an option on the Heal's website that notifies an in-store sales assistant to put on smart glasses. Using the wearable headset, the sales assistant can give online customers a personal tour of the store, provide a close-up view of products, or help answer any specific questions. Heal's has launched this as a pilot project, but is hoping to use the technology to reduce returns from online sales, as well as to enhance the sales experience and provide a more personalized level of service, especially for higher ticket items.

2.11   TRANSPORTATION, TRAVEL, AND HOSPITALITY

2.11.1   BRITISH AIRWAYS

British Airways launched its Apple Watch app in conjunction with the Apple Watch introduction in March 2015. Between June and September of 2015, the airline has seen a dramatic 386% increase in usage, with more customers using Apple Watches each month. One issue with Apple Watch users has been the reliability of traditional mounted scanners, which sometimes fail to recognize wrist devices like the Apple Watch. As a result, British Airways has rolled out more than 100 wrist-friendly ticket scanners at London Heathrow to offer Apple Watch users a stress-free experience. British Airways already sees 5% of its

mobile app usage happening on the Apple Watch, with the watch app providing real-time flight status and gate boarding updates, gate information, countdown to departure time, and destination weather updates.

2.11.2 PGT TRUCKING

PGT Trucking, a Pennsylvania-based commercial trucking company, is using the Maven Co-Pilot wearable headset that alerts a driver if it senses fatigue or distraction in real time. Five drivers are using the solution at PGT Trucking, which has more than 1,000 drivers in its fleet. The Maven Co-Pilot system has 13 sensors that detect head bobs or other instances of microsleep, including detecting the difference between durations of mirror checking. It also has a Bluetooth connection that enables the downloading of data to a smartphone and a cloud server. The data collected can also be made available to dispatchers or safety managers. With more than 500,000 trucking accidents every year in the United States, this solution is aimed at helping reduce that number by targeting fatigue, which is a leading cause of many of the accidents.

2.11.3 SCHIPOL AIRPORT

Amsterdam's Schipol Airport is one of the few airports in the world to run a pilot program using Google Glass, specifically targeted at airfield operators working on airside operations on the tarmac to ensure that everything on the ground runs smoothly. During the pilot, operators were able to look up flight details of a plane at a specific gate by using voice commands. They also used Glass to take pictures in case they wanted to alert authorities. The key value proposition for airside operators is to have a hands-free device that can help them do their jobs better. Future use cases for Glass in airside operations include being able to look up flight details by simply looking at the plane or measuring the actual distance between two points on the airfield using the device.

Figure 2.11   Schipol Airport Google Glass Pilot

(Source: Schipol Airport, YouTube)

2.11.4   QUEBEC CITY AIRPORT

Quebec City's Jean Lesage International Airport, in partnership with air transport IT solutions provider SITA, has developed an Apple Watch app targeted at the airport workforce. The application connects to the SITA Airport Management solution, which manages and centralizes all information necessary within an airport to make decisions and manage resources in real time. Quebec City's airport serves more than 1.5 million passengers per year. The watch application is used for alerts and notifications, something that airport workers usually have to check manually on their tablets. Issues like flight overlap are common at airports, which could appear as alerts directly on the appropriate workers' watches, making sure they can take appropriate action in time without causing unnecessary delays. The app was developed by the SITA Labs team by performing systems integration of the Apple Watch solution with the SITA Airport Management solution.

2.11.5   WHISTLER BLACKCOMB

Whistler Blackcomb is a popular Canadian ski resort in British Columbia, with more than 2.7 million visitors annually. Whistler Blackcomb has partnered with wearable solutions provider Vandrico to trial wearable technologies to improve resort operations. During the pilot project, chair lift staff wore smart glasses headsets that connected to RFID technology at the lift gates to show real-time data about the guests, to offer them better hospitality services. Details like a person's ticket type can reveal if a person is a beginner or an expert, or mention the number of times that they have gone on the slopes, which can then prompt staff to go to their assistance. Another pilot project is aimed at reducing lift maintenance times, alerting the right maintenance person to the job as quickly as possible. Whistler Blackcomb sees wearables as the end points in an information system, providing the ability to relay the right information to the right devices at the right time. The pilots were primarily aimed at serving guests better, but also improving internal operations of the resort.

SECTION 3

COMPANY DIRECTORY

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SECTION 4

ACRONYM AND ABBREVIATION LIST

Augmented Reality .... AR

Business-to-Business B2B

Compound Annual Growth Rate ....CAGR

Electronic Health Records..EHR

Global Positioning System ....GPS

Hand Arm Vibration..HAV

Head-Up Display .... HUD

Information Technology..IT

Mixed Reality...MR

Point of Sale ....POS

Point of View ....POV

Quick Response..QR

Radio Frequency Identification ....RFID

Strengths, Weaknesses, Opportunities, and Threats .... SWOT

Three-Dimensional...3D

Two-Dimensional 2D

SECTION 5

TABLE OF CONTENTS

SECTION 6

TABLE OF CHARTS AND FIGURES

SECTION 7

SCOPE OF STUDY

This white paper covers the enterprise wearable technology market, providing real-world case studies of how wearables are used in various industry verticals. The verticals covered include automotive, construction, corporate wellness and insurance, field services, the food industry, medical and healthcare, logistics and distribution, manufacturing, mining, oil, and gas, retail and marketing, and transportation, travel, and hospitality. The devices covered include smart AR glasses, voice-controlled headsets or clip-on devices, smart watches, body sensors, wearable cameras, fitness trackers, and other devices.

SOURCES AND METHODOLOGY

Tractica is an independent market research firm that provides industry participants and stakeholders with an objective, unbiased view of market dynamics and business opportunities within its coverage areas. The firm's industry analysts are dedicated to presenting clear and actionable analysis to support business planning initiatives and go-to-market strategies, utilizing rigorous market research methodologies and without regard for technology hype or special interests including Tractica's own client relationships. Within its market analysis, Tractica strives to offer conclusions and recommendations that reflect the most likely path of industry development, even when those views may be contrarian.

The basis of Tractica's analysis is primary research collected from a variety of sources including industry interviews, vendor briefings, product demonstrations, and quantitative and qualitative market research focused on consumer and business end-users. Industry analysts conduct interviews with representative groups of executives, technology practitioners, sales and marketing professionals, industry association personnel, government representatives, investors, consultants, and other industry stakeholders. Analysts are diligent in pursuing interviews with representatives from every part of the value chain in an effort to gain a comprehensive view of current market activity and future plans. Within the firm's surveys and focus groups, respondent samples are carefully selected to ensure that they provide the most accurate possible view of demand dynamics within consumer and business markets, utilizing balanced and representative samples where appropriate and careful screening and qualification criteria in cases where the research topic requires a more targeted group of respondents.

Tractica's primary research is supplemented by the review and analysis of all secondary information available on the topic being studied, including company news and financial information, technology specifications, product attributes, government and economic data, industry reports and databases from third-party sources, case studies, and reference customers. As applicable, all secondary research sources are appropriately cited within the firm's publications.

All of Tractica's research reports and other publications are carefully reviewed and scrutinized by the firm's senior management team in an effort to ensure that research methodology is sound, all information provided is accurate, analyst assumptions are carefully documented, and conclusions are well-supported by facts. Tractica is highly responsive to feedback from industry participants and, in the event errors in the firm's research are identified and verified, such errors are corrected promptly.

Chart 7.1   Tractica Research Methodology
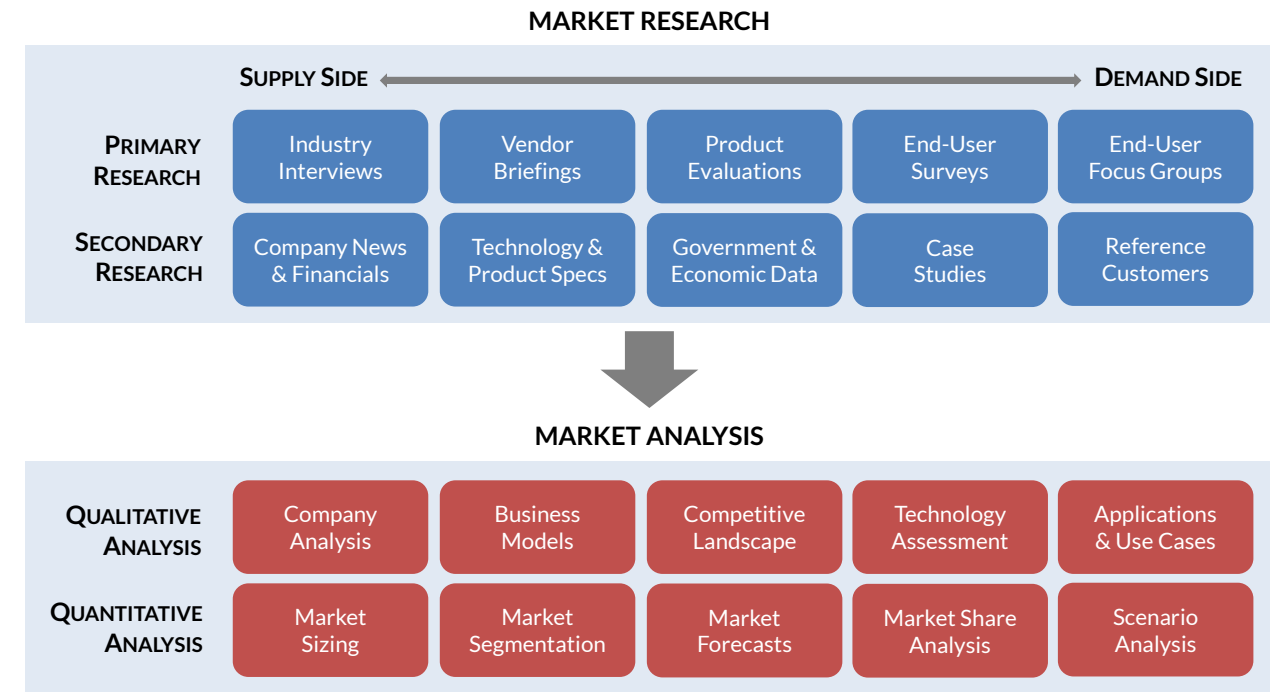
(Source: Tractica)

NOTES

CAGR refers to compound annual growth rate, using the formula:

CAGR = (End Year Value ÷ Start Year Value)$^{(1/steps)}$ − 1.

CAGRs presented in the tables are for the entire timeframe in the title. Where data for fewer years are given, the CAGR is for the range presented. Where relevant, CAGRs for shorter timeframes may be given as well.

Figures are based on the best estimates available at the time of calculation. Annual revenues, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2015 U.S. dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.

SECTION 8

ADDITIONAL READING

Tractica's Wearable Devices Advisory Service covers hardware, software, and services in the rapidly-emerging market for connected wearables. Key categories of focus include smart watches, smart glasses, and wearable sensors for consumer, commercial, and industrial markets. The wearables value chain is examined in depth including detailed analysis of supply-side and demand-side factors, from semiconductors and components to the dynamics of end-user demand for specific device categories. Areas of focus within research reports include market development factors by geography and segment, technology issues, the competitive landscape, and detailed market forecasts.

Wearable Device Market Forecasts
Smart Watches, Fitness Trackers, Smart Glasses, Smart Clothing, Body Sensors,
Wearable Cameras, and Other Wearable Devices for Consumer, Enterprise,
Healthcare, Industrial, Public Safety, Sports, and Other Markets

Published 1Q 2016

https://www.tractica.com/research/wearable-device-market-forecasts/

This Tractica report examines the market trends for wearable devices and presents 6-year market data and forecasts for wearable device shipments and revenue during the period from 2015 through 2021. The extensive and granular market data model covers a number of wearable device types including smart watches, fitness trackers, smart glasses, smart clothing, body sensors, wearable cameras, and other wearables like location trackers, smart jewelry, and gesture control devices. New categories of devices have also been added to this edition including smart footwear, smart headphones, and elderly fall detectors. The forecasts for each device type are segmented by world region, application market, and connectivity technology.

Smart Watches
Apple Watch, WatchKit, Android Wear, Tizen, WebOS, and Embedded OS:
Global Market Analysis and Forecasts for Smart Watch Devices, Operating Systems,
Connectivity Technologies, and Application Markets

Published 1Q 2015

https://www.tractica.com/research/smart-watches/

This Tractica report examines global market trends for smart watches and provides 7-year market sizing and forecasts for smart watch device shipments and revenues during the period from 2013 through 2020. The report examines the technology issues, market opportunities, and barriers for smart watches and the relevant application markets, including consumer, enterprise, industrial, healthcare, and sports. A separate analysis is provided around smart watch operating systems and the implications for watch app developers. Key industry players are analyzed in depth, including assessments of their relative strengths and weaknesses. Market forecasts are segmented by world region, application market, and connectivity technology.

Wearable Devices for Enterprise and Industrial Markets
Corporate Wellness, Manufacturing, Warehouse, Field Maintenance, Mobile Workforce Management,
First Person Communications, Holographic Modeling, Workplace Authentication, and Other Applications

Published 2Q 2015

https://www.tractica.com/research/wearable-devices-for-enterprise-and-industrial-markets/

This Tractica report provides a comprehensive examination of the market opportunity for enterprise and industrial wearables, analyzing various device categories, their specific roles, and adoption timelines in the workplace. Key device categories include smart watches, smart glasses, fitness trackers, smart clothing, body sensors, wearable cameras, and other wearables. The report also contains market sizing and forecasts from 2013 through 2020, providing shipments and revenue, along with segmentation by device category, region, and enterprise and industrial use cases.

Wearable Cameras
Consumer, Sports, Public Safety, Enterprise, Industrial, and Other Applications for Body-Worn and
Mounted Cameras: Global Market Analysis and Forecasts

Published 2Q 2015

https://www.tractica.com/research/wearable-cameras/

This Tractica report analyzes the market for wearable cameras, providing insights into the drivers and barriers that impact this new market segment, including an assessment of some of the technology issues surrounding market development. The study provides detailed forecasts and analysis of how wearable cameras are being adopted in sports, public safety, consumer, enterprise, industrial, healthcare, and other applications, and how the market will grow between 2013 and 2020. The report also provides strategic recommendations for the value chain with a competitive strengths, weaknesses, opportunities, and threats (SWOT) analysis of the key players in this market.

Smart Clothing and Body Sensors
Connected Sports and Fitness Apparel, Fashion Apparel, Baby and Pregnancy Monitors,
Heart Rate Monitors, Headbands, Posture Monitors, and 3D Trackers

Published 2Q 2015

https://www.tractica.com/research/smart-clothing-and-body-sensors/

This Tractica report examines the market opportunities for smart clothing and body sensors, including a detailed analysis of market drivers and challenges, technology issues, and the industry ecosystem. The study provides global shipment and revenue forecasts through 2020, segmented by device category, application market, connectivity technology, and world region. Key smart clothing and body sensor companies are profiled in depth and the report also includes strategic recommendations for current industry participants, as well as those who are looking to enter the market.

Connected Wearable Patches
Clinical and Non-Clinical Patches for Patient Monitoring, Treatment, and Health & Wellness Applications: Global Market Analysis and Forecasts

Published 2Q 2015

https://www.tractica.com/research/connected-wearable-patches/

This Tractica report examines the market trends, drivers and barriers, applications and use cases, technology issues, and key industry players for connected wearable patches within the clinical and non-clinical environments. It presents forecasts for unit shipments, revenue, ASPs, and segments/use cases during the period from 2014 through 2020. The report focuses on three main use cases for connected wearable patches: medical monitoring, detection, and diagnosis; medication management and treatment; and health, wellness, and prevention.

Smart Augmented Reality Glasses
Head-Up Displays, Mixed Reality Holographic Displays, and Smart Helmets for Consumer, Enterprise, Industrial, Sports, Healthcare, and Public Safety Applications: Market Analysis and Forecasts

Published 2Q 2015

https://www.tractica.com/research/smart-augmented-reality-glasses/

This Tractica report covers the various types of smart AR glasses products, from simple heads-u displays (HUDs) to mixed reality (MR) holographic displays and smart helmets. The different application markets for smart AR glasses that are covered in depth include consumer, enterprise, industrial, public safety, and healthcare. The study includes competitive analysis of the various hardware and software vendors, along with strategic recommendations for players in the value chain. Market forecasts are included for the period from 2013 to 2020, with unit shipment and revenue data segmented by region, application market, and connectivity technology.

Wearable Payments
Contactless NFC, RFID, and QR/Barcode Payment Technologies for Smart Watches, Fitness Trackers, and Payment Wristbands

Published 3Q 2015

https://www.tractica.com/research/wearable-payments/

This Tractica report analyzes the market opportunity for proximity payments or transactions made physically at point of sale (POS) terminals using wearable devices such as smart watches, fitness trackers, and payment wristbands. The report examines the market drivers and barriers, business models, enabling technologies, and key applications for wearable payments. Key industry players are profiled and case studies are provided for notable market trials and deployments. Market forecasts for wearable payment transactions and transaction volume are provided for the period from 2015 through 2020, and are segmented by device type, technology, and world region.

SECTION 9

ENTERPRISE WEARABLE TECHNOLOGY SUMMIT EAST

The Enterprise Wearable Technology Summit East is designed to provide business leaders with insight as to successful paths for adopting wearable technology in the enterprise. The carefully vetted speaking faculty consists of early enterprise adopters, technology and app developers, and other industry experts and visionaries who are driving the growth of this new wave of mobile technology in the workplace. This conference will move past the hype of wearable technology in the consumer space and get down to BUSINESS … the business of putting wearables to work in enterprise environments. Unlike other wearable technology conferences that focus primarily on the consumer end of things, this forum is designed specifically for businesses exploring applications of wearables in enterprise.

Since the enterprise is still in the early stages when it comes to understanding the opportunities and challenges of adopting wearable tech in the workplace, it is extremely important to provide businesses with an outlet for engaging with the very people and organizations who possess the relevant expertise, experience, knowledge and advice they need. By offering an intimate conference environment that is highly conducive to learning and knowledge sharing, the Enterprise Wearable Technology Summit East is the best place for enterprises to become part of the conversation and to educate each other on the applications and barriers of/to wearables in business.

Published 2Q 2016