
Mass Use of Smartwatches
Across Businesses & Industries
resco.net
technology on the move

Table of Contents

Introduction

For several years, modern Smartwatches have become a common part of our lives. Although there are hundreds of Smartwatch models available on the market and the number grows continually, the main target of all producers is within the consumer market focusing mainly on fitness purposes. In this segment, Smartwatches are typically used as an extension to an associated personal Smartphone.

On the other hand, current Smartwatches are powerful gadgets and in certain situations can serve as standalone devices. Their unique features comparing to Smartphones provide an opportunity for their mass deployment within enterprises.

This document discusses various aspects of Smartwatch usage for industrial/business purposes.

Star in Wearables

Smartwatches belong to a group of smart devices called wearables. It ranges from smart glasses or heart-monitoring jewelry to more sophisticated designs, such as programmable t-shirts, etc. But the prime position in this product category belongs to the Smartwatch. It is partly due to the number of producers and models available on the current market but mainly because of its big popularity throughout the whole population.

The reason is simple. The watch has been a common part of our lives for centuries and this applies to the current world as well. Smartwatches are only a new generation of this popular product. Another important point is that in addition to many smart functions current Smartwatches have, they can also provide us with an important piece of information that we request many times a day - time.

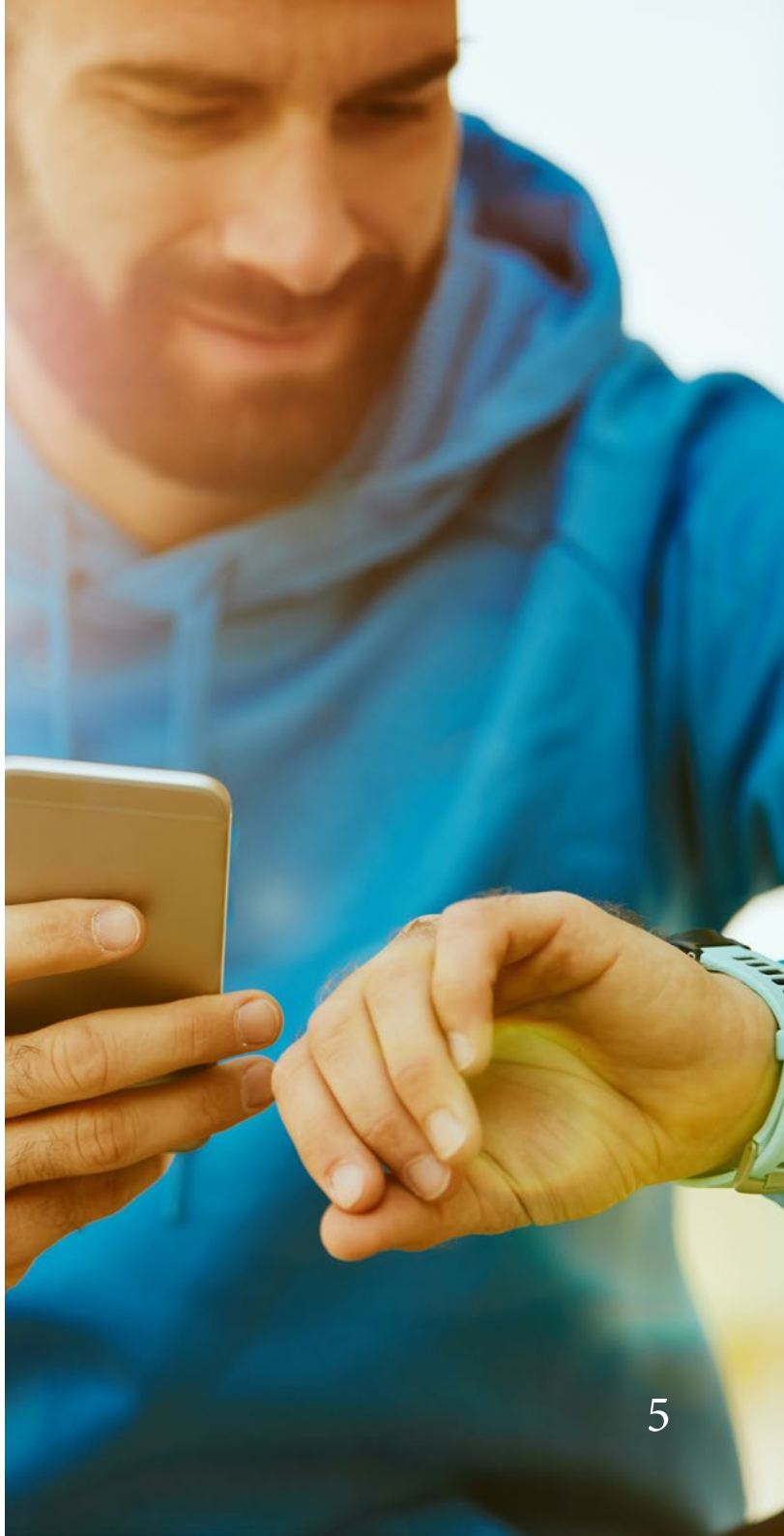
Smartwatch vs Smartphone

It's very interesting to compare it with another popular device, the Smartphone. It has been extremely popular not only among consumers but has already been adopted by many companies around the world for business purposes.

There are significant differences between current Smartphones and Smartwatches.

The **first difference** is in computing power. Surprisingly, the gap is not very significant and, in many scenarios, doesn't make an important difference from the usage point of view.

The **second one** relates to the Operating Systems (OS) used. While there are only two major OSs available for Smartphones (iOS and Android), the Smartwatch OS ecosystem is much more diverse with tens of different OSs available.



The **third one** is partially a consequence of the previous one and relates to the number of applications available. Here the gap is very weighty in favor of Smartphones. In the area of business apps, the gap relates mainly to the fact that companies don't see suitability of Smartwatch deployment in their business processes or know how to deal with some serious challenges that such deployment brings.

The **fourth one** is a device's appearance and the way of its use. This looks very important, specifically in certain business scenarios, where Smartwatches can provide significantly higher value to companies.

Let's summarize the main Pros and Cons from the Smartwatch point of view, as well as a way how a combination of both devices can be beneficial.

Pros

Smartwatches are significantly smaller than Smartphones, so they can be comfortably pinned to an employee's wrist all day. This looks like a very important attribute in most business scenarios.

- An employee usually performs other job-related activities, where he needs one or both of his hands to perform the activity. In case of a Smartphone, the employee needs at least one hand to hold and operate the device.
- Having a Smartwatch pinned to a wrist allows the continuous monitoring of a person's movement activities whereas a smartphone can easily be detached from oneself - such as being forgotten on a desk or in a drawer.
- Smartwatches allow the monitoring of angular movements of an employee hand, which has an interesting application in certain industrial scenarios.

- Continuous Smartwatch contact with the human body (wrist) allows monitoring of personnel physical/health condition (thanks to sensors like heart rate, oximeter, blood pressure, body temperature, etc.). The credibility of such values is questionable compared to dedicated medical equipment but can be helpful in certain circumstances. We see a massive usage of such functionalities in the fitness sector and the research in this area is evolving rapidly so we can expect significant progress in the quality of sensors and related software algorithms.
- Smartwatch vibrations (in case of alerts, messages, etc.) are supposed to be more sensitively perceived than having a device in a pocket, or another part of work clothing. This can be important in a noisy working area, where sound alerts wouldn't work.
- Smartwatches are more discrete, which can be beneficial in various business scenarios, for example during business negotiations.

Cons

On the other hand, small dimensions of smartwatches have also negative consequences.

- Significantly smaller display of Smartwatches means that the use of certain applications (such as internet browsing, etc.) is practically not possible. This fact must be considered when designing and developing Smartwatch business applications. Application UI, functionality, and workflow must be very clear and significantly simpler comparing to Smartphone apps. It is necessary to realize that the use of Smartwatches is not convenient for many business app requirements. Having a Smartwatch pinned to a wrist allows the continuous monitoring of a person's movement activities whereas a smartphone can easily be removed from oneself - such as being forgotten on a desk or in a drawer.

- Most Smartphone apps allow alphanumeric input through a virtual keyboard. This input method is not convenient on a Smartwatch because of its small display. This deficiency can be critical in certain business apps where alphanumeric input is frequently demanded. A solution can be speech recognition. In this case, we should consider a working environment where Smartwatches will be used. A noisy or crowded working environment can be problematic. An imperfection of current speech recognition solutions is that they don't work properly with many languages and accents. Another solution could be an external keyboard or other specialized portable hardware solution.

Combination

In some scenarios, a combination of both devices could be a good solution. A viable one is that both devices are Bluetooth connected and run on the same app. The workflow and data input are continuously synchronized between both devices. If there is no need for a large display, a Smartwatch is used by a user allowing him to use both his hands for work activity. In case of a large display being needed (complicated input, display of a picture, or a supporting document, etc.) a Smartphone can be used.

It is necessary to realize that this scenario has many difficulties in the area of software development. The application must be designed and developed for two different platforms and the workflow synchronization can be a significant amount of development effort.

Business Usage scenarios

There are several business scenarios where the deployment of Smartwatches gives significant benefits to companies. Moreover, most scenarios can be implemented in a similar way through various verticals. In general, there are two types of scenarios from the software point of view:

- **Background monitoring**
- **Interactive applications**

Background Monitoring

These scenarios use special Smartwatch hardware components and sensors to collect data that can be valuable to a company. An amount of data collected by individuals can be remotely configured and usually relates to specifics of the work activities of employees. But because of a very small footprint of data (in terms of size), there is no need for strong restrictions and data can be stored in the Smartwatch local memory and later moved to the corporate cloud system for specialized analysis. Of course, the best results can be achieved when a mass deployment of Smartwatches between employees is applied.

It is important to realize that Smartwatch software works only in the background of a device and there is no need for employee training to operate Smartwatches. Although some scenarios require an extra infrastructure to be installed in a work environment, there are scenarios where the entire deployment consists only of specialized pre-configured Smartwatches that are distributed between employees.

Following, there are sample scenarios by the type of data collected.

Workplace Access System

A smartwatch can be a simple substitution for a commonly used door access system. Such systems usually use dedicated, one-purpose cards (chips) with NFC, RFID, or other technologies. Since these technologies are also common parts of current Smartwatches, they can be used as a simple, full-featured substitution. Of course, the price level of Smartwatches is significantly higher. So, this scenario is valuable mainly as a combination with other Smartwatch functionality. This results in a reduction of one-purpose solution(s) substituted with one multifunctional system, that can be easily extended, thanks to the smart character of Smartwatch devices.

Attendance Use Case

Attendance system realized through Smartwatches can be extended with new functionality, such as check-in time, hours worked, 'time for a break' or other useful work-related information displayed on a Smartwatch display.

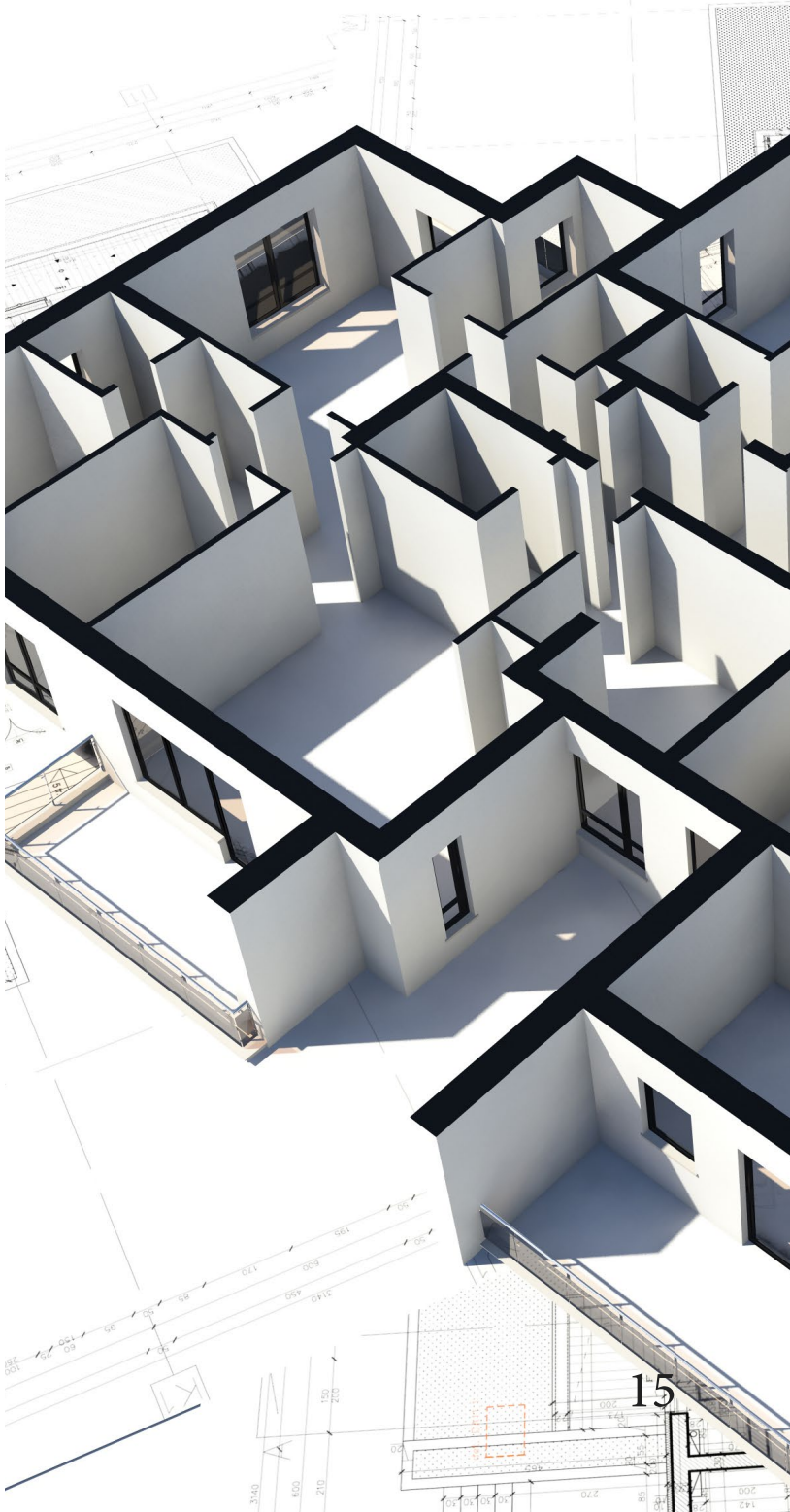
Indoor Positioning

An indoor positioning system is quite a complex topic, there are many specialized solutions available on the market. Most of them consider various techniques with the usage of dedicated hardware infrastructure and mobile devices. Positioning precision differs depending on technique and technologies used.

This is also an area where Smartwatches can be effectively used. For precise indoor positioning, standard Smartwatches must be extended with specialized hardware and software extensions, but there are many situations where less sensitive (precise) positioning makes sense and provides a valuable solution to companies. This can be realized with standard equipment built into current Smartwatches.

Room Positioning Use Case

One of the simplest solutions from the infrastructure point of view are Bluetooth beacons. There is a range of commercial products and services available in this segment. Such beacons can hardly serve for precise indoor positioning but in combination with Bluetooth enabled Smartwatches they can be easily configured for a hall/room or alternative workplace positioning. There are plenty of scenarios of how companies can benefit from this functionality.



Distance Measurement

Distance measurement is a favorite fitness feature of all consumer Smartwatches. Although most of the fitness applications use a GPS module for outdoor activities, some algorithms can calculate distance (steps) made indoors, based on a Smartwatch component called Accelerometer. In business scenarios, monitoring the distance (steps) made by employees during a day can help organizations identify where optimizations can be made.

Workplace Rearrangement Use Case

Distance measurement is usually not convenient for real-time evaluation. Instead, Smartwatches collect data of a significant number of employees which can help companies to better understand deficiencies of an entire hall or workplace. Such data can serve for an analysis that can provide the basis for workplace rearrangement (machines, storages, etc.). Such rearrangement can cause an employee to travel less distance during the day which can have a significant influence on productivity.

Angular Movement

A Gyroscope is a hardware component used for measuring orientation and angular velocity of a device. Although the Gyroscope is a common part of almost all Smartphones, it has significantly more use cases with Smartwatches. It's mainly because a Smartwatch is pinned to an employee's wrist. As such, the Gyroscope generates data with every hand movement of the employee wearing the Smartwatch.

Gyroscopic data can be used real-time providing special functionality, such as turning on the display when a Smartwatch display turns to a horizontal position, easily seen by employee's eyes or other custom functionalities.

Another possibility is background Gyroscopic data capturing for all employees wearing Smartwatches. Such data records an employee's hand movement during his work activity. Raw data can be difficult to understand but if a company performs a specialized analysis of such data, results can help companies to make various optimizations of their work processes.

Working Pattern Use Case

Although a Smartwatch can provide Gyroscopic data from one hand only, such data can be partially used to analyze a working pattern of an employee's work activity. A better understanding of working patterns of the most productive workers can help companies improve related work activity methodology, thus leading to higher productivity.

Health and Stress Level

Health sensors such as Heart rate, Oximeter, Blood pressure, Body temperature are also very popular and often used by fitness Smartwatch applications. Data captured from these sensors can be very useful also for business purposes. The most natural use is the monitoring of health and physical condition of employees, which can have a positive effect on safety. Furthermore, sensors can be also used to measure stress levels which opens even more areas of Smartwatch usage in business scenarios.

Influence of Breaks on Stress Levels Use Case

It's obvious that the stress levels of employees greatly influence their work activity. In general, less stress can positively influence employees' productivity, safety, and the quality of their output. As a general example, it is interesting to investigate how work breaks can contribute to lower average stress levels of employees. Smartwatches can identify work activities and breaks (thanks to indoor positioning), and at the same time collect information about the respective stress levels of employees. Further analysis of collected data can help companies better understand the optimal frequency and length of breaks to significantly decrease the average stress level of their employees.

Company to Employee Messaging

Messaging can be quite a useful mechanism of instant communication between a company and employees with the use of Smartwatches. There are many specific scenarios where individuals or mass messaging to employees by a supervisor can be very beneficial to a company of any type. It can be applied in a regular work situation, or in the case of an emergency where Smartwatches can help companies to deal with uncommon and potentially dangerous situations.

One of the technical difficulties of instant communication is to make sure that all Smartwatches are continuously connected, which might be a problem to achieve.

Interactive Applications

A custom application is currently a typical use of Smartwatches in businesses. Companies are trying to empower employees with Smartwatches running a specialized app to solve a specific problem and, in many situations, Smartwatches can be a good fit.

On the other hand, there are application requirements where Smartwatches are not convenient devices and the final application can be very cumbersome and difficult to operate.

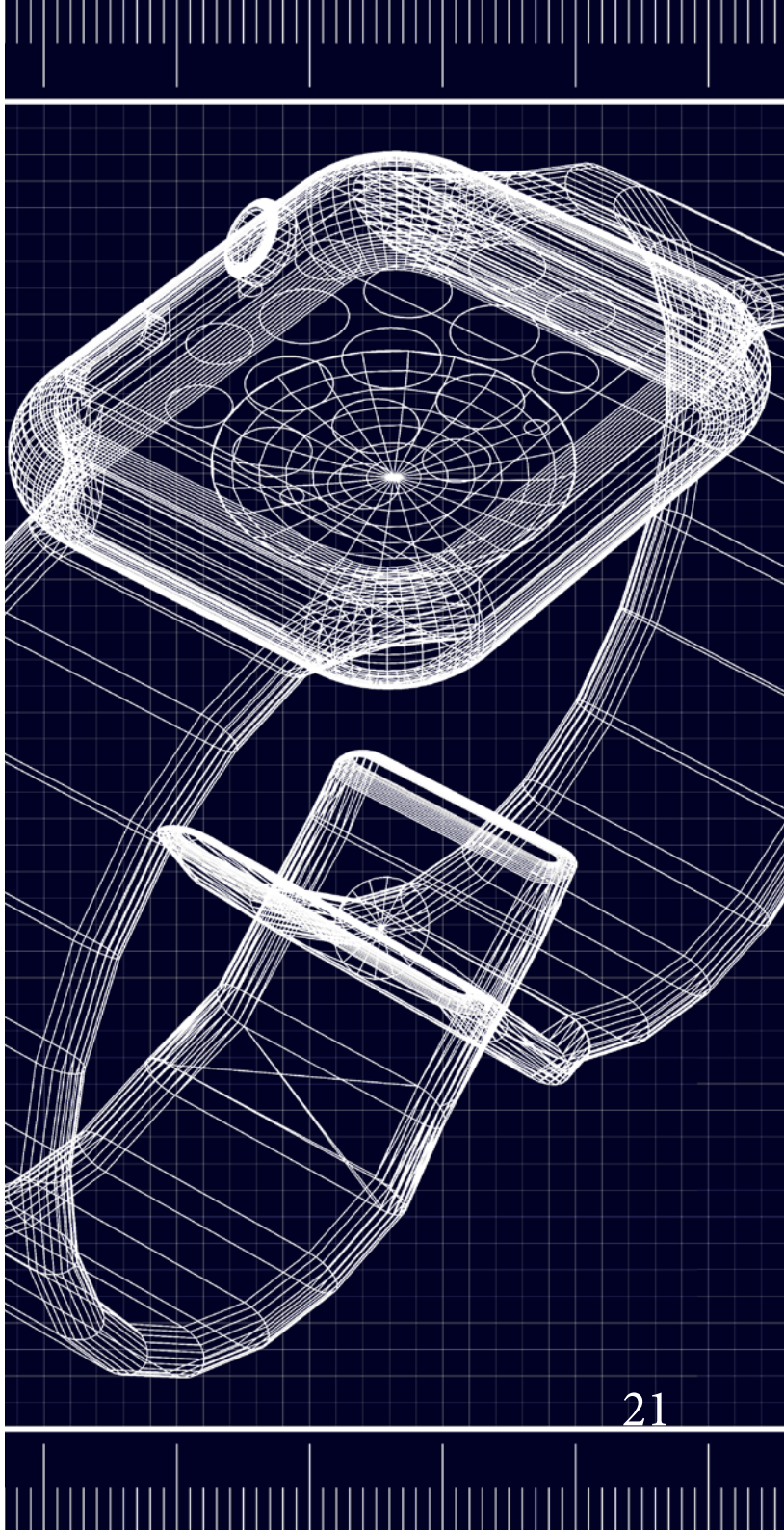
A Developer of a Business Smartwatch App Must Take into Consideration a Few Facts

Text Size

While consumer fitness apps are used mostly by young people, this doesn't generally apply to business apps. There are professions where a higher average age is common. So many users can have difficulties reading small texts sizes.

Small Display

The amount of information that can be displayed on a Smartwatch is significantly less compared to other platforms such as Smartphones or Tablets. Solving this situation with the use of small graphical icons, or other forms of information miniaturization can make an application messy and less experienced users can have problems operating the app.



Controls

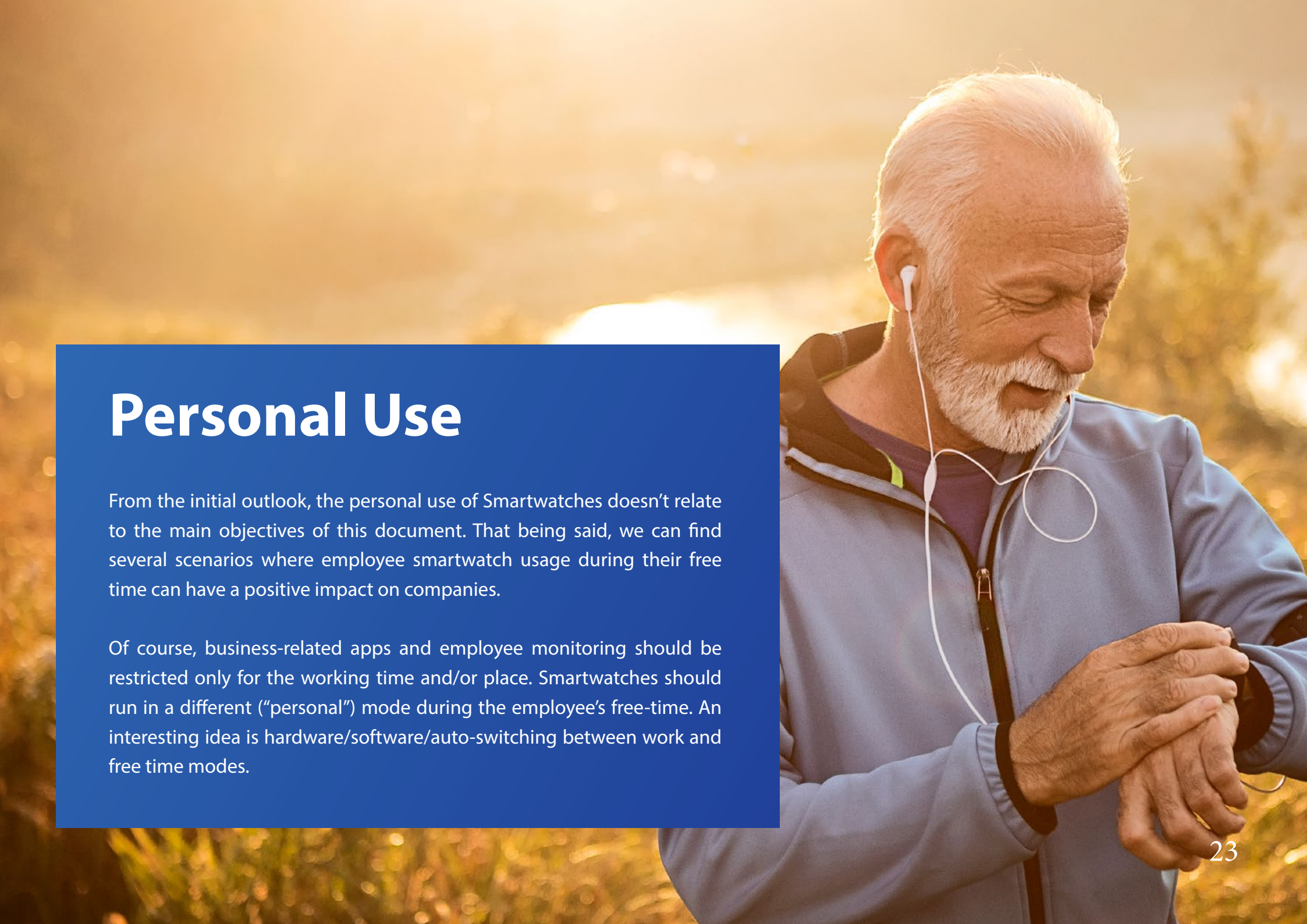
One significant specific of every Smartwatch is its hardware controls. There are Smartwatches that can be operated only through their touchscreen; on the other hand, there are watches with multiple hardware controls and no touch screen (for example some Garmin series have five hardware controls). An app developer must consider targeted Smartwatch types and conveniently adjust the operation of the application to fit specifics of all targeted devices.

A solution can be the use of a specialized multi-experience development platform, which should consider all the mentioned specifics and suggest convenient Smartwatch user interfaces and workflows.

Personal Use

From the initial outlook, the personal use of Smartwatches doesn't relate to the main objectives of this document. That being said, we can find several scenarios where employee smartwatch usage during their free time can have a positive impact on companies.

Of course, business-related apps and employee monitoring should be restricted only for the working time and/or place. Smartwatches should run in a different ("personal") mode during the employee's free-time. An interesting idea is hardware/software/auto-switching between work and free time modes.



Personal Benefit

A modern Smartwatch which can be used also for personal purposes is an interesting benefit for an employee. We must take into consideration one important fact, that a watch, as well as Smartwatch, is part of a person's looks, so its design cannot be significantly out of his/her fashion preferences. It is difficult to assume that an employee will wear his Smartwatch during his/her free time, if the design is too industrial or too big. A decent look and feel of Smartwatches and maybe the possibility to choose from several models would convince also employees that have never used a watch before.

Smart Device Skills

Having employees use their Smartwatches also during their free time will help them become more skilled at using smart device technologies.

Fitness Activities

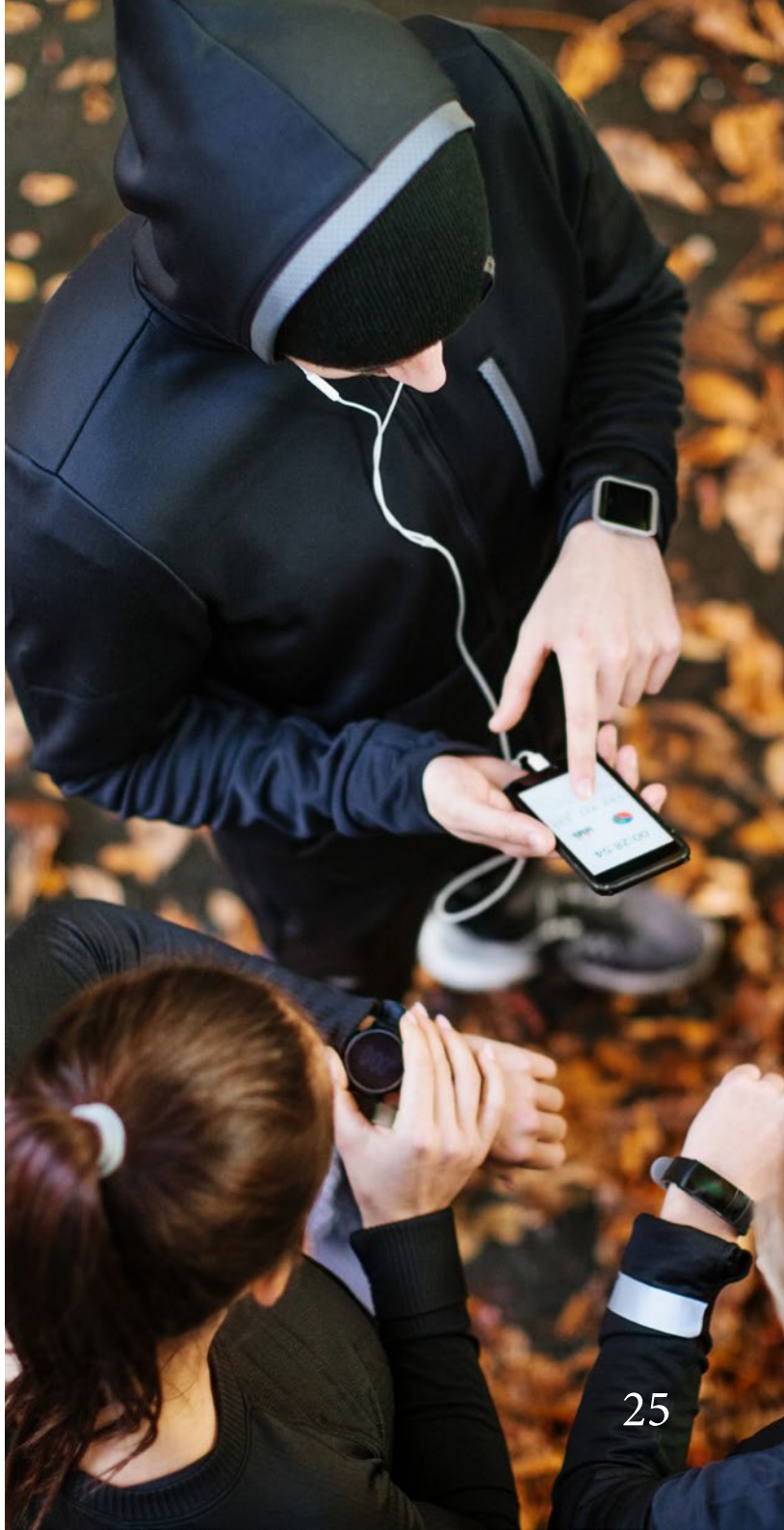
There are studies mentioning that the use of Smartwatches positively influences the number of fitness activities completed by a user. More fitness activities can have a positive effect on an employee's health, which has a clear positive effect also on his/her professional life.

Health Monitor

In some circumstances, health functions of Smartwatches can be used also during employee free time. Employees with certain medical conditions (high blood pressure, etc.) can allow a corporate doctor to have health monitoring during treatment.

Battery Charge

The personal use of a Smartwatch motivates the users to charge their devices overnight. This can help companies to have Smartwatches 'ready for work'.



Challenges

The industrial use of Smartwatches opens some serious challenges companies should consider and deal with. Any kind of Smartwatch deployment in a company usually influences working processes. In some situations, a non-functioning device can cause only a small inconvenience, but there are cases where one non-functional device can stop an entire production.

Some challenges have quite easy solutions but there are ones that might have inefficient solutions under the current hardware and software offering.

Employee Acceptance

The industrial use of Smartwatches opens some serious challenges companies should consider and deal with. Any kind of Smartwatch deployment in a company usually influences working processes. In some situations, a non-functioning device can cause only a small inconvenience, but there are cases where one non-functional device can stop an entire production.

Some challenges have quite easy solutions but there are ones that might have inefficient solutions under the current hardware and software offering.

Production Guarantee

The current Smartwatch market is dominated by consumer models. There are tens of producers and hundreds of models available. Moreover, because of rapid development in the area of smart technologies the life cycle of each model is short and new models usually come with significant hardware and software upgrades. A similar situation is in the area of Smartwatch operating systems, where many producers stopped supporting globally known Android OS and started producing their own OSs, that are often badly documented, or provide limited SDKs. The reason might be their attempt to achieve a better computing power and battery life.

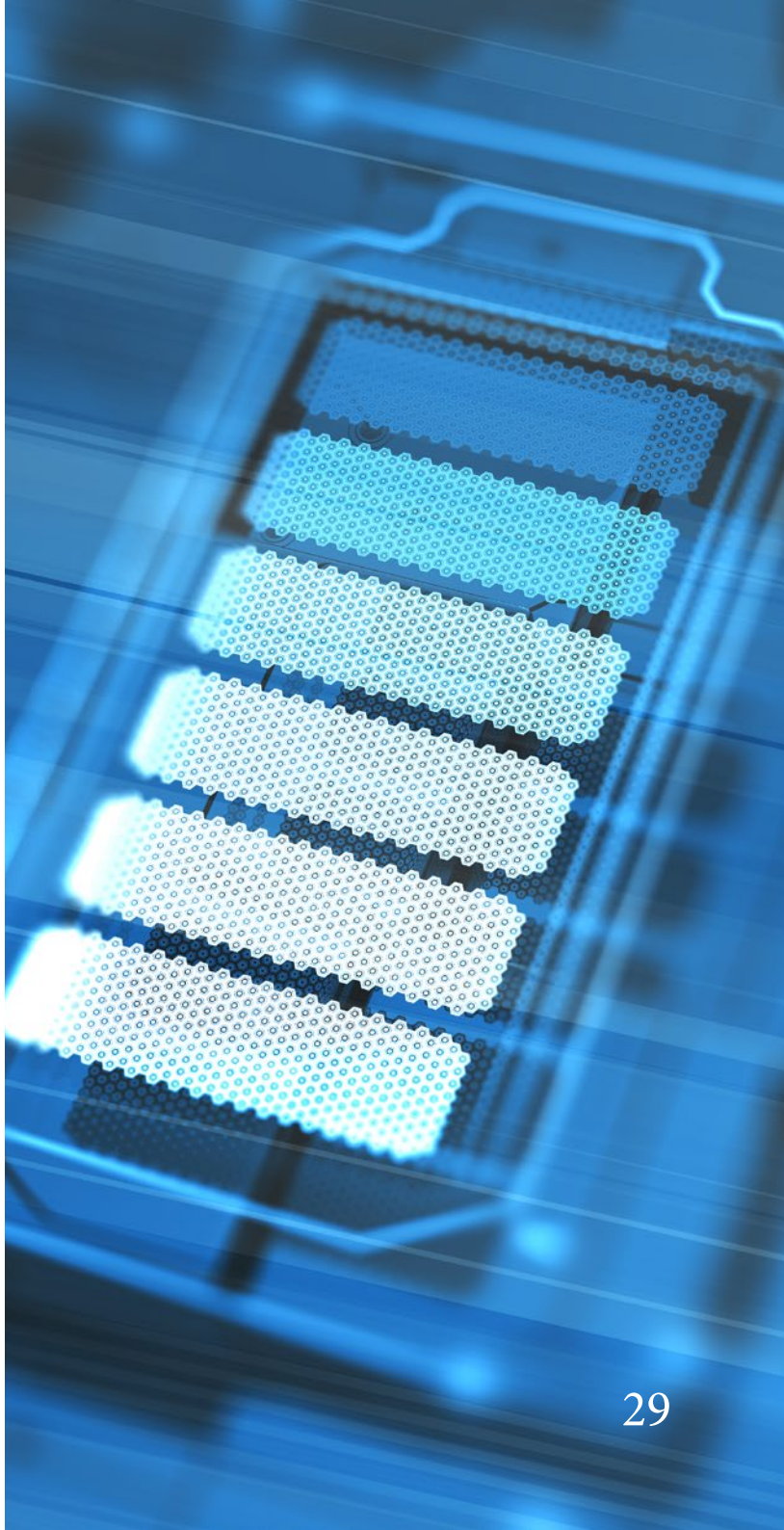
Currently, it is impossible to find a Smartwatch model with the long-term guarantee of production or backward compatibility of new models.

This has a significant influence on custom-developed applications, that need to be often rebuilt and retested with every new model. This can be a time consuming or critical problem.

Battery Life

Most Smartwatches have a full day (approx. 24h) of battery life. There are models with a battery life of a few days and very few models providing weeks of battery life. Of course, that battery life depends on the way Smartwatches are used. It relates mainly to the use of displays, processors and other components such as GPS, etc.

The main aim for companies should be to have all Smartwatches operational during working hours for all critical work positions. So, every company should have a system of how to regularly charge all Smartwatches on a daily/weekly basis depending on battery life. Moreover, they should also have a system of an immediate Smartwatch charge/replacement for all critical positions, where non-functioning Smartwatches can result in critical downtime.



Conclusion

Although the Smartwatch is a wearable with big popularity throughout the current population, there are only a few cases of its deployment in industrial businesses. This contrasts the situation with the Smartphone, which have been successfully deployed in organizations of all types around the world. While there are indisputable cons of Smartwatches - such as its small screen size and limited input methods, the Smartwatch has several unique advantages that open a new era of smart technology usage in industrial environments. Most of the advantages do not relate to technologies used, but to the way how it is worn. Having employees use their Smartwatches also in their free time provides interesting benefits to companies and although industrial deployment of Smartwatches opens some serious challenges, it is only a question of time when companies find solutions to deal with them and find Smartwatches a very beneficial companion for their operations.

In 2020 the US penetration of Smartphones will be 72,2%, while all wearables penetration will be only 23,3% (by statista.com). But since the era of Smartphones has already 13 years of history (Apple iPhone was introduced in 2007), the era of modern Smartwatches just recently began (Apple Watch was introduced in 2015). Smartwatches have a certain huge potential and the penetration gap between the two technologies can be overcome in the period of a few years, and the industrial sector can significantly contribute to this.

Discover how to increase productivity & safety with smartwatches.

Book your free consultation with a Resco expert

www.resco.net
smartwatches@resco.net

@RescoMobileCRM
YouTube @RescoDevelopers
LinkedIn /company/resco-net