Taking the fast-track into the connected wearables market

Make-or-buy considerations

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Executive summary

The COVID-19 pandemic is challenging healthcare systems around the world to implement the latest efficiency-boosting innovations at speed. It has shed new light not only on the value of telehealth, but also on the usefulness of remote monitoring supported by wearables.

New technology supports the development of wearables for business applications, enabling better solutions than those currently available (e.g. smartphones, fitness bands and smartwatches). With a Compound Annual Growth Rate (CAGR) of 22.2 % the business opportunities are clear. Provided they adopt the right approach, new entrants to the wearables market will be able to enjoy a share of this growth.

There are numerous factors to consider: the feature set, lifetime costs, manageability, adaptability and time to market. New companies entering this market need access to a broad and diverse range of skills and experience: encompassing design and engineering, hardware manufacturing and software development. If deciding to outsource production, there are three main options: buying a commercial off-the-shelf solution (COTS), using an Original Design Manufacturer) or building a customised solution on the mSafety platform from Sony.

The mSafety platform allows companies to build a precisely targeted remote monitoring service that address specific customer needs. Sony has extensive experience in hardware design and device management solutions and offers partners unique features such as LTE modem technology, IoT platform and activity algorithms. But please note that mSafety is not a turnkey solution, nor a medical device.

Market growth

The market for connected wearables is estimated to grow at a CAGR 22.2 %, with the total number of shipments reaching 262.5 million units by 2021.

Technology improvements

Advances in the following areas: support the development of smarter, more convenient wearables.

- Increased battery capacity
- Better hardware design
- Less expensive sensors
- Computing power

Reliable communications

New telecom standards i.e. 4G & 5G support over-the-air management. End-to-end encryption of sensor data, ensures sensitive information is protected.

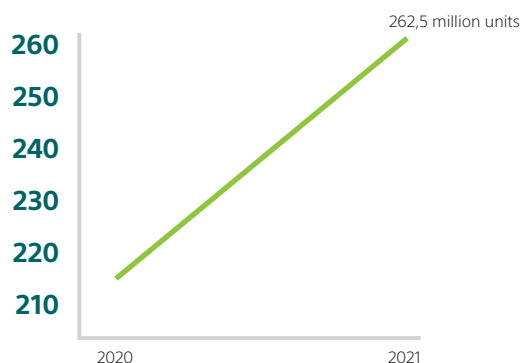**SONY**

The wearables market

Setting your course

As a provider of services to the health & wellness or the personal safety segment, maybe you've thought about offering a wearable device for measuring and collecting client data. If so, your first big decision will be whether to produce the wearable device in-house or buy it from a third party.

Here, we outline the factors you need to consider when making that decision and present the benefits and potential challenges of buying a ready-made solution.

Market growth forecast

Wearable devices first made their debut in lifestyle and wellness applications. However, in recent years, they've proven highly useful in the management of chronic health conditions such as diabetes, hypertension, pulmonary conditions, heart conditions and stroke. In such cases, both care managers and end users benefit from access to continuous live data streams and from the convenience that comes with remote monitoring.

Expected growth in the market for connected wearables 22,2 % CAGR

How the segment is divided

262,5 million units

- 260
- 250
- 240
- 230
- 220
- 210

2020　　　　　2021

Other The total wearables market 66,5 million

Fitness & activity trackers 81 million

Smartwatches 115 million
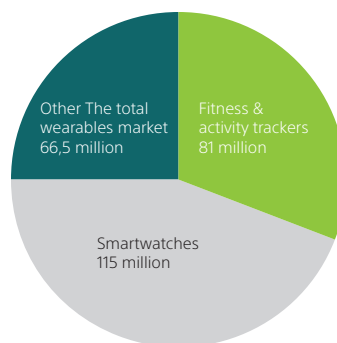
[1] Bergh insights M2M Research Series 2017, Connected Wearables

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Technology Overview

The market for health and fitness monitoring abounds with different types of devices. They offer varying levels of complexity and come in a range of form factors from wristbands to smartwatches, clip-ons and fitness straps. Below, we compare today's three most commonly used device types and briefly outline the technological advances contributing to their development.

Smartphones – advantages and limitations

Smartphones have become a natural part of daily life for people of all ages. Indeed, in many countries, literacy on a mobile device has become a prerequisite for full participation in society. It's the everyday tool citizens use to interact with the authorities, to buy goods and services, and to interact with friends and family. Instant access to up-to-date information is something the majority of people now take for granted. However, the elderly and the very young sometimes struggle to use a smartphone. Lack of manual dexterity, technical complexity and limited battery life can all present issues.

Fitness bands and smartwatches

The main difference between fitness bands and smartwatches is that the former are designed with the very specific needs of health and fitness enthusiasts in mind. The latter, smartwatches, can both send and receive information, which makes them suitable not only for collecting but also for sharing health data with a third-party care manager. However, just like smartphones, smartwatches present challenges to the elderly and very young. For example, battery life, connectivity and the need for pairing with a smartphone can all be problematic. Due to their complexity, smartwatches are also unsuitable for use in emergency situations such as trauma or incidents involving solitary workers.

New technology supports the development of wearables

New technologies are being introduced at a faster pace than ever. Innovations that increase battery capacity, make sensors more cost-effective, improve hardware design and boost computing power are all contributing to the development of smaller wearable devices that fit more easily into the user's daily life. At the same time, new telecom standards like 4G and 5G support over-the-air management and end-to-end encryption of sensor data, ensuring that sensitive information does not fall into the wrong hands.

Considerations

Things to think about when entering the wearables market

Perhaps the single most important question to ask yourself at the start of your journey, is whether developing a wearable is part of your company's core business or merely an enabler? If it's only the latter, you may conclude quite quickly that developing your own device is not worth the time, resources and risks involved, and that it makes more sense to buy from a third-party vendor. If you're unsure, keep reading.

As with any product development project, there are numerous factors to evaluate. Feature set, lifetime costs, manageability, adaptability and time to market, just to name a few.

Match feature set to target group

Most off-the-shelf wearable solutions are designed for consumers who've made an *independent* decision to monitor their own health or lifestyle. They often provide a fantastic set of features to appeal to gadget enthusiasts. Users can choose apps, change settings, set up accounts and more. They are in control.

By contrast, users in the B2B segment have not made an independent decision and neither want nor need the same degree of control when it comes to choosing apps, performing firmware updates or changing settings. It is the role of the service provider to select and manage the device's features.

Consider, for example, the elderly stroke patient who has been advised to wear a monitoring device by her doctor, or the employee at a chemical plant who has been instructed to wear it by his employer. In such cases, the top priorities for the wearable are durability and a straightforward user-interface, not customisation or control.

Data access and ownership

Data has come to be regarded as one of the most valuable resources in today's economy. It is hardly surprising, therefore, that data access and ownership are such hotly debated topics. Any questions about who will own the personal data gathered by your wearables and who will have access to it therefore need to be resolved in advance. To ensure your end users' security, integrity and privacy the device platform you choose must enable end-to-end encryption of transferred data.

Note that if you choose an off-the-shelf wearable device, your end users might be required to sign up for an account of the vendor in order to use your application. This means their personal data may be accessible to and stored by the vendor. Not all users are comfortable about sharing personal information with a corporation whose intentions they do not fully understand. As a service provider, you need to establish a clear position on data ownership and decide how to communicate it to your clients.

Type approvals

Before launching a B2B wearable service, you are legally required to get type approvals. For this, you must provide a technical file with a set of documents related to each use case. This process may be time consuming and costly, but it is unavoidable. Following the correct procedure is even more critical when developing products for use in an industrial or medical application.

Once ready, your wearable must be tested and certified for compliance by an accredited laboratory. The type of certification you need depends on your target market. A government-appointed organisation should then provide final confirmation that your test scope and results meet the legal requirements. This final step is done by a notified body for CE certification in Europe and for TCB in the US. If operating in markets outside the US and EU, local approval processes will apply.

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Time-to-market

When it comes to launching wearables, speed is of the essence. This is not only because of all the competitors on your tail, but because technology often changes faster than the time it takes to get from feasibility study, through design and development, to production and shipment.

Having identified the need for a wearable solution and made the decision to go ahead, you will face a limited window of opportunity to bring it to market. A delay of 3-6 months could mean that the window has closed.

Adaptability

The more work that is required to integrate a wearable with the service provider's own systems, the higher the development costs will be. To avoid unnecessary expense, it is advisable to choose or develop a wearable that can be easily adapted to your given application -one that will work smoothly from the backend to the end user. Similarly, it makes sense to choose a platform that requires the minimum amount of effort and implies as few technical limitations as possible.

Lifetime cost

When budgeting for the use of wearables as part of your future business, it's important to consider their lifetime costs. Costs rise fast if you have to maintain a large installed base with devices of different ages. For professional usage, you need to consider questions like availability, upgradability and the total cost of the solution.

Ultimately, it makes the most sense to choose a device that lasts several years rather than one which needs replacing annually.

Manageability

Once you have a large installed base of wearable devices, the next challenge is to ensure the latest software is always installed. You want to avoid the costly and cumbersome process of updating a large fleet manually and locally. Look instead for a remote, secure and simple device management' tool — one that allows for over-the-air updates.

Production questions

What skills and resources do you need to produce a wearable device?

Regardless of whether the development work is done in-house or outsourced, it's a challenging task to find the broad and diverse range of skills and experience needed to drive a wearables project successfully.

Design and engineering

Arguably the most important development step is to define the device's features and quality requirements. You need to cover all the mechanical and electrical aspects as well as the necessary software, down to the last detail.

You then need to define KPIs that address these demands, in order to secure the quality of your end product and guarantee a return on your investment.

If your wearable definition is not sufficiently detailed, you risk having longer lead times, higher costs and ultimately a poor customer experience down the line.

Hardware manufacturing

When it comes to producing the hardware, you will need to assign a manufacturer, ensure you meet the regulatory requirements and get the correct certifications for your target markets. Beyond that, you will need to organise your supply chain and build up the necessary systems for warranty, repairs and device maintenance.

Software development

The development of embedded applications and services in an IoT environment are two distinct disciplines. An IoT wearable can be managed both from the back-end and by the user. Your developers not only need to understand how the device functions in the network, but also how it is managed from the back-end. Mastering this level of complexity requires a broad set of knowledge and experience in diverse technologies.

Some questions to consider:

- Are both the technical and lead-time risks within acceptable levels to meet the window for this market opportunity?

- Can you forecast the cost of maintenance for your business with reasonable accuracy?

- Are the legal risks manageable, bearing in mind that third-party licensees will be required?

- Is the internal rate of return realistic and aligned with the project lead-time risk?

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Outsourcing

Options for outsourcing

If you decide to outsource the development and production of your wearable solution to a third party, the next step is to consider *how much* of the work you feel comfortable outsourcing. Consider how dependent on a third-party can your company afford to be.

At one end of the spectrum, you might decide to buy a turn-key solution including hardware, embedded application and a full back-end; at the other, you could just cherry-pick and outsource the competence you lack in-house. Below we present three options along with their pros and cons:

1. Consumer version of commercial off-the-shelf (COTS)

Acquiring a consumer-based COTS wearable is probably the first option that comes to mind. They are easy to get a hold of, and it is relatively easy to find developers with experience of developing applications on existing platforms.

Pros:

- Availability
- Large pool of skilled resources
- Time to market

Cons

- More features than necessary — adds cost and complexity
- Difficult to maintain — updates and upgrades
- Complex for the user — connectivity issues and need for companion devices
- Lack of backend support for device management
- Uncertain long-term availability for your solution

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2. Original Design Manufacturer (ODM[2])

A common solution for complex hardware development projects is to use an ODM. This type of out-sourcing presents a completely different set of challenges from those of an in-house development project, but there are challenges, nonetheless.

It helps to have previous experience in this area; to have established good routines for specifying, verifying, validating etc. *and* to have achieved a high level of quality in all the details.

Pros:

- Fulfill the specific needs of your use case/cases

- Good control over maintainability

- Good control over product lifecycle

Cons:

- Challenges getting the desired quality from your chosen ODM

- Cost of non-recurring engineering (NRE) i.e. one-off costs involved in researching, designing, developing and testing a new product

- The need to inspect and validate the manufacturer for non-functional aspects of production e.g. quality, radio compliance, licensing, sustainability, labelling etc.

- Time to market

3. The mSafety platform from Sony

The mSafety wearable platform is a third option that allows you to take advantage of Sony's expertise in connectivity and high-quality hardware design. Our offer is based on market needs and specifically designed to address the key obstacles and issues inherent in the other two approaches. It allows you to enjoy the positive aspects of outsourcing while bypassing the uncertainties of an in-house project.

[2] An original design manufacturer (ODM) is a company that designs and manufactures a product on behalf of another firm. You specify what's needed, then brand and sell the product once it has been made – thereby avoiding any direct dealings with the factory.

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About mSafety

What is mSafety?

mSafety is a secure, reliable B2B platform upon which you can develop and scale your own client monitoring applications and services. The platform includes a wearable device and a back-end solution, both of which are adaptable to a broad range of use cases.

mSafety enables continuous collection of data from e.g. those living with chronic health conditions like diabetes or cardiovascular disease, or at-risk seniors living in their own homes. It is also suitable for monitoring the safety and wellbeing of healthy people of all ages who are engaged in high-risk activities, at work or leisure.
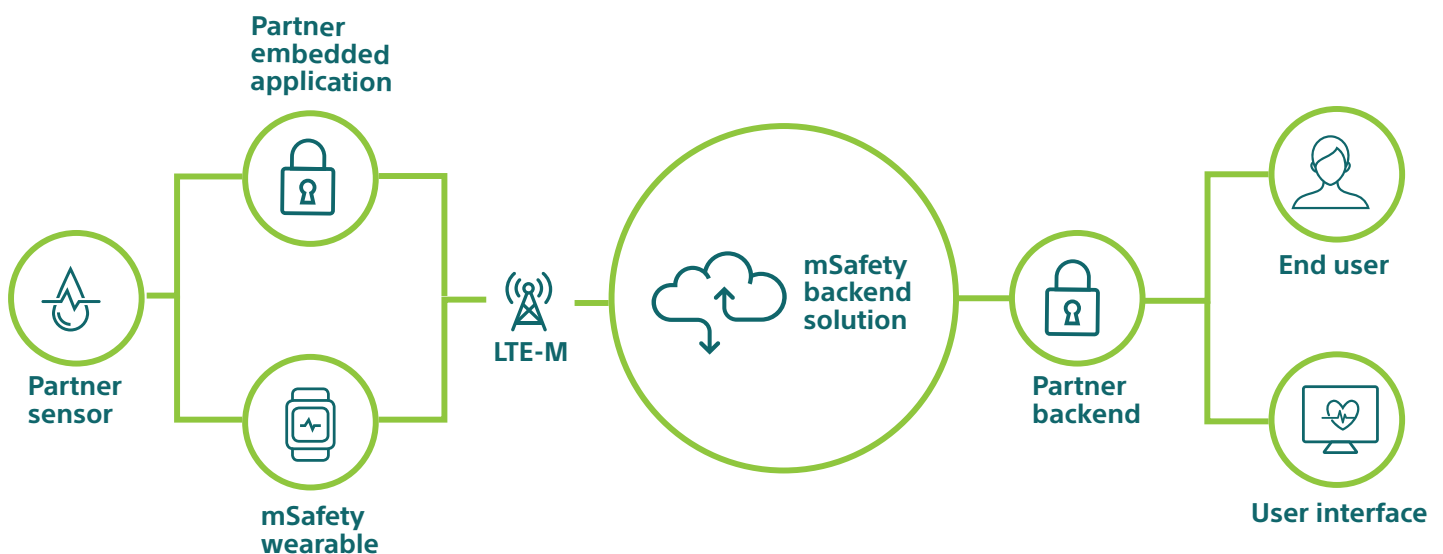
The platform offers bi-directional communication, enabling service providers to both receive and send messages. This feature allows service providers to be more proactive and stimulates the development of new, improved services over time.

mSafety includes connectivity and subscription management as a service.

What is mSafety not?

mSafety is not a turnkey solution. It combines a purpose-built wearable (which does not require pairing with a phone) with a secure back-end cloud solution.

Although the device is suitable for a variety of different use cases, including medical, it is important to note that the mSafety wearable is *not a medically certified device.* Should medical certification be necessary, Sony partners are responsible for acquiring this.

Partner embedded application

Partner sensor

mSafety wearable

LTE-M

mSafety backend solution

Partner backend

End user

User interface

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Business advantages of mSafety

Summary of advantages for your business:

The mSafety platform has everything you need to build a precisely targeted remote monitoring service that meets your customers' specific needs.

It allows you to benefit from Sony's vast, accumulated experience in hardware design and fleet management solutions, and from unique features based on Sony IP such as LTE modem technology, IoT platform and activity algorithms. All the non-functional quality aspects are taken care of.

Convert CAPEX to OPEX

Using mSafety offers similar financial benefits to SaaS[3]. Once you have invested in the hardware, Capital Expenditures (CAPEX) convert quickly into Operating Expenses (OPEX), freeing up cash to invest in other business initiatives.

Easy to implement

Since mSafety is a fully packaged communications platform, it protects you from the challenges of getting your solution implemented and fully operational – thereby, allowing you to focus on your core business objectives.

Better cash flow

With the mSafety pay-as-you-go model, costs are directly tied to revenues. As soon as you're up and running, you will enjoy a better cashflow.

Compliance

Compliance in areas such as sustainability, quality assurance and labour rights are all taken care of by Sony.

Mitigate quality risks

Since some manufacturers see quality as a cost they may be tempted to cut corners, resulting in unreliable hardware. By leveraging Sony's decades-long expertise in providing quality hardware, you can mitigate such quality risks.

[3] In the Software as a service (SaaS) distribution model, a third-party provider hosts applications and makes them available to customers over the Internet.

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Be a market leader in remote monitoring

Why not take advantage of mSafety – a quicker, easier way to get into the wearables business? One that allows you to position your company as a leading provider of IoT healthcare services without losing focus on your core business.

If you'd like to talk to us about how we can help fast-track your company into the wearables business, please send a meeting request to

msafety@sony.com

https://iot.sonynetworkcom.com/msafety/

mSafety