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PERSPECTIVES



WEARABLES & THE INTERNET OF THINGS:

A REVIEW OF THE TECHNOLOGY AND ITS

APPLICATION FOR LIFE & HEALTH INSURANCE

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## What are wearables and the Internet of Things?

A relevant definition of wearable electronics is: “devices that can be worn or mated with human skin to continuously and closely monitor an individual's activities, without interrupting or limiting the user's motions”.<sup>1</sup>

When this wearable communicates with other device(s) or connects to the Internet, then this is Internet of Things (IoT).

Wearables include a broad spectrum of technologies, and have many purposes in daily life. The best known is for monitoring behaviour and lifestyle and they are also useful in assisting elderly and disabled people, monitoring hydration levels or ensuring the correct dose of medication is dispensed.

Also, solutions have been designed for addressing the concern of health and safety in the workplace such as: sensor clips monitoring trips and falls or location of workers in hazardous workplaces, smart glasses allowing workers' activity to be monitored remotely and promoting guidance and support or movement sensors that can monitor workers' movements for preventing injury.

## How does a wearable device work?

Wearable technology uses sensors to collect data from the user. Such sensors encompass location and motion related technology such as GPS, accelerometer, gyroscope or compass but can also include biometric sensor(s) such as heart rate monitor, ECG or skin temperature.

Depending on the wearable, either a limited or a wide range of information is collected. Data captured by the sensor(s) is stored in the wearable device and is transferred to a computer, a smartphone or a warehouse server either automatically or with manual user interaction. Wearable data transfer to a third-party server is possible in theory but not in practice due to technical limitations in energy consumption.

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<sup>1</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4996079/>

## Wearables and the Insurance Industry

Incorporating new technology in insurance is not something really new within the industry. Usage-based insurance (UBI) such as “pay as you drive” (PAYD) or “mile-based auto insurance” was launched several years ago in France. However, with wearable technology and IoT, the way to collect information and the volume and the contents of information collected have changed.

General insurers can be considered as early adopters of new technologies. Implementation of black boxes in cars allows the insurance company to use telematics technology to collect information directly from the customer, rather than relying on self-declaration. Information that was previously not accessible to the insurer is now easily obtained which enables the insurance company to work proactively.

Technological evolution has led to a new type of product “pay how you drive” (PHYD) where the driver’s behaviour is part of the pricing variables. This kind of product has existed in Canada since 2013 yet remains an innovation in several countries.

Regarding life and health insurance, the subject’s behaviour including lifestyle risks, such as obesity or tobacco and alcohol consumption, forms part of the underwriting process. In terms of pricing, socio-economic variables are used as many lifestyle-related diseases have certain risk factors in common that are closely related to the socio-economic status of the claimant.

However, wearable technology helps industry fine-tune its existing risk assessment pattern with a more granular approach by giving it the opportunity to access a new set of data. Moreover, as the data is collected continuously over time, insurance companies are able to change their underwriting model from a static one to a continuous one.

Incorporating new information in the underwriting process can make it cost efficient. Insurers would be able to reduce the time it takes for issuing a new policy if they:

- i) can access historical wearable data at the time of application and,
- ii) utilise a triage approach to quickly determine whether the data indicates a healthy lifestyle.

Beside the technical aspect, using wearables is a way to target new customer segments such as millennials and, more importantly, to increase customers’ engagement and improve their interaction. Technology allows insurers to move from a transactional perspective to a relational perspective and to rethink products and customer interactions.

Last but not least, wearables also have a place in the claims management process. Some companies are considering for instance to carry out virtual damage assessment for motor insurance or to manage and reduce disability income claims through rehabilitation and exercise programmes.

Applications seem endless and concern all kinds of insurance.

### The pros and cons of adopting new technology

While “wearables” undeniably constitute a positive development and are full of opportunities for the insurance sector, this is not without challenges. What follows is our assessment of various points that may arise in the context of setting up an insurance offer incorporating this new technology.

## Market fragmentation

Like any electronic product, the wearables market is fragmented and products have a short life cycle. Many products have been designed and developed for collecting specific information while more generic products are designed and developed for a purpose other than collecting data; data is just a by-product.

Market fragmentation, in the absence of standardisation, affects interoperability and data integration while the short life cycle relates to how changes in device(s) during the data collection period may affect the metrics, data models and ultimately the results of analysis.

As we observed in the past with computers for instance, we may expect that with time, there will be less brands and products because of merger and acquisition activity or simply by closing the activity. In the meantime, for an insurance company, partnering with a single provider is restrictive and partnering with multiple providers is challenging.

A solution is to use the services of a data aggregator who collects the data from a wide range of health, lifestyle and wearables apps and passes this data to a third party (for example, the insurer) in a cleaned-up format. This comes, however, at a cost. There is no single answer and the cost vs. benefit is the key.

## Accuracy, consistency of measurements and reliability of data

Regarding technology, validity and reliability of the metrics varies between devices and brands and can even vary between products belonging to the same brand, as devices are required to make assumptions in their metrics. Several studies are highlighting the discrepancies that could exist between wearables when computing the same metric.

Software designers and devices manufacturers are already working on addressing this point and we can expect to have further versions with more accurate and consistent measurements. While medical devices are showing greater accuracy, the way wrist-borne like devices are used is to monitor longitudinal change for the same individual. In this case, accuracy is becoming less important.

Insurers should pay attention to the purpose of the device which collects the information and review how the measurements are determined. It is obvious that information captured by frictionless devices directly from sensors would be the ideal solution.

## Loss of interest and drop-off rate

Several studies indicated that up to 50% of those who own wearables lose interest and stop wearing them in the first year. It is unclear if today's wearables for the average consumer can provide enough data to make up for a lack of use. Such a problem is inherent to technologies which incorporate a fashion element, or when the customer does not see the value proposition and benefits.

For mitigating the risk of drop-off, the value proposition of the insurers must match with the expectations of the insureds. For instance, it has been demonstrated that products that have features that reward frequent users with monetary rewards or loyalty points would be the most successful value proposition as they match customers' expectations.

## Representativeness of population/demographics

There may be further sensitivities within different cultures about sharing information gathered through wearables or even the fact of wearing wearables may be strange to some. Insufficient understanding, cognitive/mobility disorders, low purchasing power, disinclination towards technology and negative perception in sharing information could also restrict the use of wearable technology.

### What would happen if the product itself were an underwriting variable?

According to a French mobile phone operator, the typical iPhone buyer is aged between 25 and 35 years old, has a Master's degree or above, has a keen eye for design, likes high-end technology and already owns Apple product(s).

In a Consumer Intelligence Survey, PwC (2016) noted that:

- i) men are more likely to own smart watches and smart glasses than females who were more likely to opt for a fitness band,
- ii) millennials are far more likely to own wearables than older adults. They also noted that adoption of wearables declines with age; consumers aged 35 to 49 are more likely to own smart watches.

### Data quality

There is a hierarchy of evidence, which indicates the usefulness of information in identifying or understanding the risk factors. While everyone will agree that collecting more data is a way to improve the industry's ability to accurately underwrite and price, there is still uncertainty regarding which data is most useful when explaining the risk. Collinearity between variables may affect their significance.

There is a risk that a forward-looking insurer may embark and invest in developing a system for collecting Physical Activity data and find afterwards that the socio-economic status he was using is the most relevant or that other external variables are affecting the study results.

Currently, variables such as age, gender and BMI remain robust indicators for predicting mortality and morbidity. There is a clear correlation between BMI and physical activities. The same applies to the variable "age".

## Regulations

As mentioned earlier, in the context of "wearables and IoT" applicable to the insurance industry, insurers and/or reinsurers would collect information whose relevance will only be known at the end. Due to the sensitivity of the data collected, it is likely that any regulatory body would look closely at the data collection and its contents, raise questions or simply legislate.

Having access to additional information allows more granular underwriting and therefore specialisation, with a possibility that the markets fragment. Related to that is the concern that high-risks would become uninsurable. Without cross-subsidisation, there can be no insurance and it is likely that any regulatory body will follow such a development closely.

The industry may face a situation similar to the inclusion of genetic testing in underwriting, the inclusion of which is banned in several countries. Yet, there is no real answer for mitigating that risk. The insurance industry must ensure it maintains an acceptable level of cross-subsidisation.

## What has this review unearthed?

Behaviour is known to be a factor in the motor insurance underwriting process. It is becoming an emerging area of interest for life & health insurance too since behaviour is a causal factor in rising incidence rates of several non-communicable diseases.

Wearable technology enables the insurance industry to access an improved or new data set, helping it to obtain better knowledge of the risks and to shift from static underwriting to continuous underwriting.

Yet, the technology could be considered as being at a nascent stage and may only be part of the solution rather than the whole solution, due to the limitations we identified earlier. Products and their metrics are improving. It is just a matter of time.

As it stands today, it is unlikely that insurers could change customers' behaviours, and customers may feel uncomfortable if their insurer(s) start overtly engaging in the aim of modifying their daily actions. On the other hand, wearables technology offers the insurance industry a fantastic opportunity to improve customer engagement, to target a new market segment and to improve communication.

The more we know from the customer, the more likely we are to have appropriate communication that would in turn lead to more relevant risk-transfer solution(s). Wearable technology appears to be a great vector for that. The greatest disruption we can see today relates to customer engagement/segmentation and innovation in customer communications.

As of now, it will take some more years before we see automation in the biometric data process and underwriting. However, incorporating physical activities such as steps per day would definitely enable an insurance company to improve its underwriting process.

Currently, for an insurer, embracing wearable technology and incorporating it within an insurance offering would mean balancing cost versus benefit while mitigating inherent risks and embarking on a journey where the business case and ultimate design proposition will continuously change.

In the future, new technologies such as exoskeletons and nano-implants (frictionless technologies) could be major disruptors for the insurance industry.

Trust Re, as a long-term reinsurance partner and forward-looking reinsurer, is closely following up the emergence of new technology in order to come up with risk-transfer solution(s) that could improve customers' experience.



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