

Wearable Devices and their Applicability in the Life Insurance Industry

Introducing wearables into the life insurance customer journey



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1. Introduction

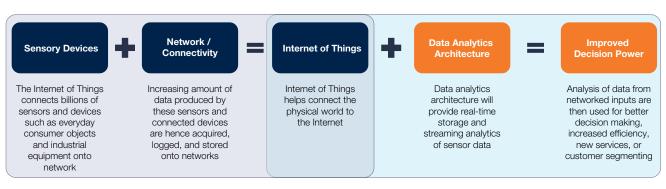
The **Internet of Things (IoT)** is gaining popularity across all industries. The IoT is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

In business, the IoT has immense opportunities to significantly improve decisions. Today, with almost every device being connected to every other device and communicating to each other, a huge net of connected things is being created. Most industries are starting to invest to leverage the benefits of the IoT. The spectrum of connected devices now spans from simple fitness wearables to complex sleep trackers, and is stepping into the realm of medical devices.

Wearable devices are widely used for measuring personal fitness, managing busy schedules, and incorporating a healthy lifestyle, etc. At the same time, there are other innovations starting to happen in the areas where wearable devices could analyze medical conditions. On their own, these devices have limited usage, but when they are connected to each other and other systems, the potential that unfolds becomes immensely powerful. The IoT, when coupled with data analytics, enhances decision-making power.

Sensory devices with access to networks are a perfect example of what the IoT is and does (see Exhibit 1). Life insurers are using sensory devices for better risk assessment. These devices generate huge amounts of data as they communicate among themselves through the network. The benefit is that when the IoT is combined with data analytics architecture, the result is improved business intelligence to make more informed business decisions.

Exhibit 1: Internet of Things in Business



Examples of Sensory Devices for Better Risk Management in Life Insurance					
Sensors	Examples of Hazard Sensed	Risks	Action by Life Insurers		
External biomonitors (including fitness bands, wearable technology, and smart contact lenses)	Abnormal: pulse, blood pressure, oxygenation, temperature Inadequate exercise Poor sleep patterns	Markers for impending health hazardsLifestyle issues	Notification to the policyholder for taking actions to avoid health hazards and improve lifestyle Information on how it can impact premiums		
Internal biomonitors	Abnormal blood and urine chemistry Drug use	Various diseases Slow healing from illness or injury	Notification to the policyholder for taking precautions to avoid risks Information on how it can impact premiums		
Genetic mutations	Increased likelihood of certain diseases	Illness, disability, death	Notification to the policyholder for taking precautions to avoid risks Information on how it can impact premiums		

Source: Capgemini Financial Services Analysis 2015; The internet of things and life and health insurance, Celent, April 2014

Sensory devices such as wearables, nearables, and hearables have unique advantages, each with an aim of simplifying the human lifestyle (see Exhibit 2).

Wearables are defined as electronic technologies designed to perform computing functions similar to or better than mobile phones and laptop computers that are incorporated into items of clothing and accessories, which can be worn on the body.

Nearables are single-transmitter devices that could be equipped with a whole set of miniaturized sensor technologies, such as an accelerometer, thermometer, ambient light sensor, or humidity sensor.

Hearables are a new wave of hybrid devices that merge the health-tracking capabilities of a smartwatch with the high-quality audio we have come to expect from premium earbuds.

Exhibit 2: Sensory Devices - Wearables, Nearables, and Hearables

	Wearables	Nearables	Hearables
Key Features	 Tracking physical and health-related activities or interactions They provide navigation, the ability to listen to music, near field communication (NFC) payments and take phone calls Use navigation to track location and provide local information or routes, record video and take pictures & perform online searches 	 Currently, nearables are developed with a proximity range of about 70 meters depending on factors such as weather Enclosed in silicone cases and can be used outdoors Batteries in the nearables can last at most for one year 	 Hearables are believed to give more accurate data as compared to wearables, as ears have a limited motion in contrast to a shaky arm, which could impact the reading Hearables give users greater discretion compared to wearables, as they are small in nature as opposed to a bulky smartwatch or a Google Glass
Application	 Using body sensors for health monitoring to stay fit and guard against any health hazards Remotely manage equipment, such as machinery on an assembly line, making the workplace safer for employees Hands-free access to data via smartglasses or a smartwatch 	When entering a movie theater, for example, beacons could automatically silence your phone Nearable deployed on a laptop sends information regarding laptop excess heating to smartphone Will remind the user through smartphone if he forgets the laptop at any place Retailers like Macy's are already testing the waters, sending shoppers discounts specific to the department where they're browsing	 Hearables reflect light off of blood vessels near the skin's surface to track heart rate, temperature, speed, and distance while allowing the user to enjoy music simultaneously A user's fitness data, including the calories burned, can be sent to smartphone through bluetooth A smart ear device can make it possible to research information online through a series of voice commands and digital reading response capabilities

Source: Capgemini Financial Services Analysis 2015; "Hearables' could be the next wearables — and with good reason", Aason Krumins, ExtremeTech, May 14, 2015; "Designing A User Experience For Wearable Devices", Gradinar Razvan, Usability Geek, January 12, 2015

Innovations in technology and acceptance by customers have led to more wearable device launches over the past two years. During this time, many new start-up firms have manufactured and launched wearable devices. This productivity has led to an increased use of wearable devices, as well as contributed to the increased prevalence of the IoT.

With the usage of such devices, a significant amount of data is generated, which is further refined and analyzed to gain insights. Insurance companies are using advanced data platforms to manage this data and generate strategic analysis for making better business decisions. When a source generates data, it moves to the predefined data platform for further processing, running business rules, and generating decision points for use in the business model while maintaining data quality and security. The data is consumed by various applications for a more

focused functional analysis, such as claims analytics, underwriting analytics, enterprise decision management, and real-time loss control and feedback system analytics.

Technological advancements, increased acceptance, and real-time and rich customer information have paved a clear way for growth in the usage of wearable devices. Integration of data from wearables with devices such as smartphones, have increased the usage of wearables, as it provides convenience for customers to access data. More brands, such as Apple, Google, Samsung, and FitBit have introduced a wide range of wearable devices, which assist customers with a number of functions. Advancement of communication technologies, such as NFC, has also led to improved connectivity and better data sharing from wearables.

An additional incentive to using a wearable device is that it aids customers in monitoring their body's biometric information and keeps track of their health goals. It is expected that the usage of wearable devices will increase exponentially in the near future. The revenue from the global wearable electronic products market is expected to cross \$11.6 billion by the end of 2020, growing at a CAGR of around 25%.¹

Data from wearables helps insurers to continuously monitor information about their customers. Employers have started encouraging employees to use fitness devices, in collaboration with life insurers. Data from wearables enable life insurers to stay updated on their insureds' health condition, and also alerts them in case of any symptoms or vital sign changes, such as irregular heart beat and high or low blood pressure.



^{1 &}quot;Wearable Electronics and Technology Market Worth \$11.61 Billion by 2020", PR Newswire, September 25, 2014

2. Impact on Life Insurance Value Chain

Wearable devices will impact all parts of the life insurance consumer journey (see Exhibit 3). The wearable ecosystem will have multiple touch points at various stages of the value chain. As more people start using wearable devices and make it a part of their daily lives, the life insurance value chain is likely to witness changes in some of the processes utilized to collect data from the usage of wearable devices.

Exhibit 3: Wearable Ecosystem Drives Insurance Value Chain

Claims Processing **Front Office Policy Administration & Underwriting** Personalized Product Policyholder Service & Risk Control Claims Management Continuous Underwriting **Development & Marketing** · Lifestyles and daily Emergence of new pricing models based All notifications to customers will be Beginning of new realhabits sensory data on continuous data analysis from managed here, to control risk, in an time claims management released by wearable wearable devices event of a sudden adverse health by an adjuster devices constantly feed Flexible premium based on real-time condition Data in the form of the insurer data data analysis Distinguished services based on videos, images, audios, Customer segments are Bonus / Penalty programs for customer segments will be used to identify defined based on data overachieving / not meeting a set target This will also manage warning signals to customers when a potential threat or analysis Premium pricing options based on how Products are marketed frequently a policyholder agrees on abnormality is detected based on the risk sharing health reports and related · Changes in policyholder details are exposure to each personal data detected and updated based on data customer segment More specific and Accurate risk assessment and pricing Better customer engagement Potentially reduced customized products for Greater availability of insurance float for On-time notifications that can improve claims cost and better each customer segment turn-around claims time investments life expectancy of customers Summary of impact on each value chain segment ■ Benefits to Life Insurers

Source: Capgemini Financial Services Analysis 2015; SME Inputs



The insurance value chain is likely to witness changes in some processes to utilize data collected from the usage of wearable devices

- The insurer's Front Office will be impacted on a major level by wearables, starting with user experience, extending to non-intrusive data collection, and going all the way to engaging effectively with the insured. With the analysis of data collected at this stage, it will be easy to identify the needs of already existing insurance customers. The data can also be used to define new customer segments. Insurers can use the data collected from customers to study risk behaviors and use this information to market products to each customer segment. This enabling technology will enhance the target-market strategies of insurers.
- Under Policy Administration and Underwriting, the analysis for new pricing models considering the new data inputs from wearable devices will emerge. These will be used to calculate premiums by analyzing the continuous flow of real-time risk-surrogate data. The result could be an increase or decrease in premiums based on the activities taken up by customers seeking a healthy lifestyle. This will improve the decision-making power for better risk assessments and pricing. Due to better predictability, insurers will also be able to benefit by having greater availability of insurance float for investments. In addition, policyholder service will manage all the communications for putting systems in place to mitigate risks by raising warning signals in an event of a sudden adverse health condition. This will help insurers execute on better customer engagement and also might improve the chances of preventing a risk event happening to customers.

The Claims management process will be initiated when the notification is sent
in case of a mishap. It will also check potential frauds, reduce claims costs,
and provide a better turn-around time for claims issuance. The claims process
could fundamentally change from a reacting-to-risk model to a preventingthe-risk model.

2.1. Front Office: Product Development & Marketing

The product development team will have the ability to better design products based on the understanding of individual risks with the aid of wearable devices. Currently, new products are designed through policy modifications that involve changes to the scope of cover, market wordings, or sub-limit, which is called deal-by-deal innovation and is implemented through underwriting tools such as deductibles and profit commissions.

Insurers can benefit from the continuous generation of data with the usage of wearable devices. The analysis of data gives insights to customer information about the risk exposure behavior and lifestyle. Insurers can use these insights to develop personalized products to pitch to the right customer group.

Insurers can develop products that are customized as per the needs of customers. The input to designing such products could be the risk exposure, daily activities around a healthy lifestyle, sleep patterns, and heart report. Such data is generated from wearable devices and can drive the future product development and marketing phase of the life insurance value chain.

Another development at this phase would be to make the product management more dynamic. Product design can be modular where adding and dropping risk can be dynamic and instantaneous. The instances where a customer is identified to be travelling beyond a certain predefined distance from a recorded home location can be automatically added to its existing insurance portfolio till return.

Moreover, wearable devices can also feed insurers with the information to better match a customer's preferred distribution channel. Insurance agents can be located using location-based technology. The data from a wearable device can also be synchronized with the insurance company's application authorizing the individual with unique details such as finger prints and heartbeat pattern to match the prerequisites of the policy to be undertaken. A policy sold through such channels will require inputs through wearable devices to keep the policy ongoing and track the other incidents in life that impact the mortality of the insured.

2.2. Policy Administration & Underwriting

Policy administration and underwriting depends on historical data analysis. However, with the aid of wearable devices, this stage will evolve as a result of real-time data analysis. There will be new pricing algorithms and predictive analysis to identify the major risk defining variables. Communication with customers is also likely to transform the policyholder servicing stage. It will result in more interactions between the insurer and insureds to indicate health patterns that are harmful or beneficial for the longevity and healthy life of the insured.

Underwriting & Pricing

Traditionally, customers were required to undergo health check-ups and their health status was recorded at the time of underwriting a policy. It was assumed that this customer information would be the same for the entire policy duration. Considering the customers' demographics, actuarial models were run to determine the price of insurance.

But that's all changing. Usage of wearable devices will now help insurers in setting realistic premiums for customers. Premiums can be set for the first cycle based on the health condition of the customer at the time of the policy issuance. The guess work that predicted the price of the insurance and the evaluation of the factors regarding a consumer's specific health risk will change to evidence-based pricing. With the introduction of data, insurers receive more evidence about customers' health activities. These activities can be analyzed periodically and premiums can be calculated based on the available data for the upcoming premium cycle. Pricing will have similar features such as telematics for car insurance based upon actuarial models for the first cycle and then a bonus or penalty can be added from the second cycle onward.

Policyholder Service

Interactions with customers happen at this stage, mainly with the purpose of premium payment or during the claims management stage. Requests are initiated by customers and insurers are required to complete the requests. Services are only performed at specific request from the insured or policyholder, or as a consequence of policy conditions and clauses.

Policyholder service will transform from being a customer-initiated activity to an insurer-initiated activity in an era of wearable device usage, where the captured and analyzed data will govern the communication with policyholders. At this stage, insurers will require new skill sets as they learn the best ways to induce customers to reduce the likelihood of loss. Such communications can potentially prevent claims by use of predictive analytics. Leveraging data collected from the wearable devices, the insurer will be able to track the lifestyle of an insured person and act accordingly. Wearable devices can help insurers in serving customers:

- Provide additional waivers when needed (for example travel insurance for health care when abroad)
- Provide warnings to an insured when the device informs the insurer about a declining health condition
- Provide devices dedicated to the elderly, who need special monitoring and can use sensor data to prevent claims and help in post-operative care or during rehabilitation

2.3. Claims Management

Claims management decisions, if backed by data from wearable devices, are likely to drive a critical breakthrough for the claims issuing process. Currently, insurers ask for proof of being alive to the insured for initiating the claims process. The bereaved has to supply a death certificate to prove that the insured person has deceased. Furthermore, the investigation happens after submitting the claims form along with the required documents to the insurance company. Once the claim is validated, the insurance company issues the claimed amount to the claimant. This long process of closing the claims process increases the turn-around time and is one of the main reasons for overall low customer satisfaction.

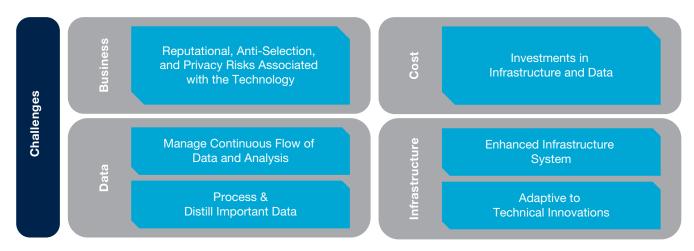
New methods for claims processing and fraud mitigation can be implemented, which will be based on analysis of data collected through wearable devices. The data related to the real-time health status and the location of the insured can be used to initiate the claims process. With life insurance going mainstream with wearable data, the insurers can identify the possibility of claims from a customer. This data will also control fraudulent information that occurs in cases where such information is absent. Wearable devices can also send signals to insurers and initiate the claims process, which further reduces the turn-around time to pay the claimed amount. A customers' overall satisfaction level depends on how easily and quickly the claim is processed and the claimed amount is released. Thus, wearable devices also help in enhancing customers' satisfaction levels with their insurers.



3. Challenges to Life Insurers

Insurers will face some challenges to implement activities driven by real-time data initiated by wearable devices (see Exhibit 4). There could be challenges related to business, data, infrastructure, and investments. Major challenges include infrastructure development and managing real-time data from various sources.

Exhibit 4: Challenges in Wearable Ecosystem Drives Life Insurance Value Chain



Source: Capgemini Financial Services Analysis 2015; "Wearable technology: tailor-made for life and health insurers", Industry Report Store, January 21, 2015

Challenges introduced by a wearable ecosystem related to business could be reputational, anti-selection, or relate to privacy risks associated with the technology. As more information is made available, the really healthy pay less and less, and the less healthy either pay more or ultimately find they cannot get coverage. Insurers will also need to put systems in place that will ensure customer data security in an age where data leakage has become a critical threat to firms.

It will be a concern for insurers to manage the continuous flow of data from wearable devices and analyze the data real time. However, as wearable devices will provide a constant stream of real-time data inputs, insurers will have to carefully manage synchronization and storage of data. It will also be a challenge for insurers to distill the strategically important data out of all the data noise, so as to optimize processing.

The legacy technology systems pose further hindrance to life insurers in embracing wearable devices as an integral part of the insurance processes and decision-making strategies. Considering the volume and velocity of data, insurers will need robust data and network infrastructure to receive, store, and manage all the information. As wearable technology advances and modifies, it will be important for insurers to ensure flexibility and scalability of systems to adapt to the changes.

Insurers wanting to create the infrastructure to manage the wearable data will need to invest heavily in implementing new systems or modernizing their legacy systems. Providing wearables to customers might also result in significant CAPEX investments for insurers. In most cases, insurers may not be the owner of the data generated

from wearable devices and will need to partner with third-party device manufacturers to access the data. Consequently, cost might also be an important factor when partnering with third-party product providers to collect data for analysis purposes.

The nascent stage of adoption of wearables and the lack of credible data on return on investments might create challenges when developing a business case for use of wearables in life insurance. Currently there are very few insurers who have incorporated wearable devices in their product offerings and wish to provide suitable health benefits to their customers. However, due to the early stage of adopting wearable devices and being the first movers in this field there are many unknown challenges that can obstruct the way forward. Therefore, insurers should be ready with a plan to mitigate the impact.



4. Success Story

One of the leading life insurers in the United States is already offering wearablebased products to its customers.

About the company

A leading financial services group with principal operations in Asia, Canada, and the United States offers and administers a broad range of financial products, including life insurance, annuities, investments, long-term care insurance, college savings, and other forms of business insurance.

What have they done?

New Product

This insurer has announced a whole new approach to life insurance that rewards policyholders for healthy living by offering:

- Premium discounts for leading a healthy lifestyle
- · Valuable travel, shopping and entertainment-related rewards, and discounts from leading retailers

New policyholders will receive a free Fitbit® to help track their progress.

Partnership

The leading insurer in the United States has partnered with Vitality, a member of Discovery Ltd., a global financial services organization offering an incentive-based wellness program to employers as part of their benefits program.

How does it work?

Step 1. Accumulate Vitality Points: Members earn Vitality Points by completing simple everyday activities to stay -healthy-like going to the gym, getting annual health screenings, staying tobacco-free, and more.

Step 2. Earn a Vitality Status: Each year, policyholders can earn a Vitality Status - Bronze, Silver, Gold, or Platinum - based on the number of Vitality Points they accumulate.

Step 3. Enjoy Savings and Rewards: The higher the Vitality Status, the more you can save on premiums and the greater your rewards and discounts.

Benefits to Customers

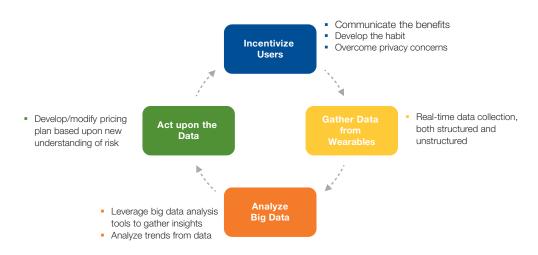
By integrating a wellness benefits program the insurer offers several benefits to policyholders with this innovative and new life insurance solution:

- Industry-leading financial protection for customers
- Opportunities to significantly save on the annual premiums based on the Vitality Points
- Earn valuable rewards such as travel, shopping and entertainment, and discounts from leading retailers
- Premium discounts on their policy for taking steps to improve their health

5. Conclusion

The emerging use of wearables in the life insurance industry will require a strong futuristic-driven approach to make it a success (see Exhibit 5). Life insurers will require planning the inclusion of wearable devices in their product lines and determine the critical points to consider sensory data input for pricing these products.

Exhibit 5: The Wearables Usage Cycle in the Life Insurance Business



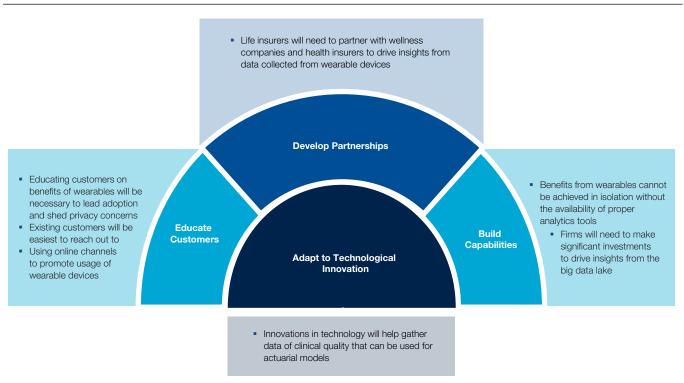
Source: Capgemini Financial Services Analysis 2015

- To increase the adoption of wearables and also the willingness to share the
 data with insurers would require increasing awareness of customers and also
 assuaging concerns. Insurers can incentivize their customers by communicating
 the benefits and ensuring the safety of the private data.
- When customers get accustomed to wearable devices, the data generated can be collected in a data warehouse. Real-time data will be continuous and could be unstructured and structured.
- Life insurers can leverage the power of big data and conduct analysis to gather insights. This data can also be used to analyze health-related trends for each customer.
- On the basis of this customer analysis, life insurers can act upon the data and
 make decisions by identifying trends. They can take action to develop or modify
 the pricing plan based on the new understanding of risks and customers' healthy
 activities.

Leveraging value from wearables will require firms to develop capabilities in big data and analytics—the lack of either one might result in unrealized value from investments.

Additionally, wearables can be a means to offer the ideal customized offerings, though it would require huge investments and a strong commitment. We have identified the key building blocks that will help insurers to easily initiate the wearable usage cycle in the life insurance business (see Exhibit 6).

Exhibit 6: Key Building Blocks to Leverage True Potential Presented by Wearables



Source: Capgemini Financial Services Analysis 2015

- Customers need to be educated on the benefits that a wearable device can provide. Insurers can design strategies that can mitigate the privacy concerns of the users and lead them to comfortably use the devices and share data with insurers for future financial benefits
- Life insurers will have to look for partnerships to efficiently track and store relevant data. Many life insurers have partnered with wellness firms such as Vitality, which can intensify the ideal usage of data from wearable devices
- Insurers will have to develop their own capabilities with proper analytical tools. These tools will be the most important building block in driving value from the data. This will also require insurance firms to invest heavily in analytical tools because the deluge of data from wearable devices will be too huge to derive insights in the absence of such tools
- Insurers will have to be adaptive to technological innovations and will have to design actuarial models based on the data feed as well as the behavior analysis of

Wearable devices, which form a significant portion of the IoT, have huge potential in transforming the insurance business. While the wave has just begun, many life insurers have already adopted wearable devices in their business quotient. The incentives of using wearable devices in terms of cost and customer retention can be encouraging for the many life insurers about to embark in this direction.

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