

InsurTech - Working Group Findings & Recommendations

Report on InsurTech in the context of
Risk Assessment, Product Design and Pricing



Working Group to examine 'Innovations in insurance involving wearable / portable devices'
IRDAI

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Members of the Committee:

1. Ms.Yegnapriya Bharath, CGM, IRDAI, Chair
2. Mr.V.Jayanth Kumar, CGM, IRDAI, Member
3. Mr.S.P.Chakraborty, GM, IRDAI, Member
4. Ms.Anita Josyula, GM, IRDAI (Convenor)
5. Mr.DVS Ramesh, GM, IRDAI, Member
6. Mr.Dinesh Pant, AA, Life Insurance Corporation of India
7. Ms.Gouri Rajan, DGM, The New India Assurance Company Ltd
8. Mr.Tapan Singhel, CEO, Bajaj Allianz General Insurance Company Ltd
9. Mr.Ashish Mehrotra, CEO, Max Bupa Health Insurance Co Ltd
10. Mr.VV.Balaji, Chief of Technology and Operations, ICICI Pru Life Insurance Co Ltd

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LIST OF ACRONYMS USED

Sl.No.	Acronym	Details
01	Fintech	Financial Technology
02	Insurtech	Insurance Technology
03	IT	Information Technology
04	IoT	Internet of Things
05	P2P	Peer-to-Peer Computing
06	AI	Artificial Intelligence
07	VO2	V-Volume O2-Oxygen
08	OPD	Out Patient Department
09	ADAS	Advanced Driver Assistance Systems
10	UBI	Usage Based Insurance
11	ML	Machine Learning
12	DLT	Driver Less technology
13	LOB	Line of Business
14	NCB	No Claim Bonus
15	T&C	Terms and Conditions
16	VAS	Value Added Services
17	OAM	Open Architecture Model
18	OEM	Original Equipment Manufacturer
19	FMCG	Fast Moving Consumer Goods

EXECUTIVE SUMMARY

1. Financial Services, including insurance, are embracing technology faster by the day. InsurTech is emerging speedily giving scope to the introduction of new business models, applications, processes and products. Innovations in InsurTech come in from different sources—there are both demand side and supply side perspectives. There are several types of innovations that fall within the scope of InsurTech—Digital platforms, Internet of Things (IoT), Big Data Comparators, Robo Adviser, Machine Learning, Artificial Intelligence, Blockchain, P2P, Usage based and so on. Insurers are keen on investing in technology as they perceive the risk of disruption if they don't. Many insurers have dedicated teams to monitor new technologies to be able to understand their true potential for disruption.
2. Insurers believe that technology will help them assess risks better. Data analytics and Predictive Models are seen as a boon by insurers to understand the risks they take on as part of their core business. When it comes to underwriting, Artificial Intelligence and Machine Learning can help insurers and agents underwrite risk effectively, by using big data from customers that has been collected from multiple sources. Wearables can play a crucial role in underwriting in both Life and Health Insurance. In motor insurance, insurers can track driving habits via telematics and IoT devices. IoT and AI can also help tremendously in fraud detection.
3. The use of technology has an impact on product design and the efficiency of inclusive insurance delivery. However, it can pose certain risks. There are various possibilities where technology can help device better products that could help cover hitherto little covered categories, sub-standard lives for examples. For instance, product and benefit offering could be directly linked to the performance and progress of the individual's health score.
4. Data capture may pose several concerns and challenges. Insurers ought not to use the data for purposes other than those intended. They ought not to share it with anybody without the policyholders' consent. The intent of collection of data and usage thereof ought to be part of the product filing with the Regulator.
5. Jurisdictions across the globe have different approaches to InsurTech. UK's Financial Conduct Authority (FCA) has an innovation department which is involved in policy engagement with the InsurTech community. BaFin of Germany takes a "technologically neutral" approach to emerging InsurTech.

When it comes to Mexico, the supervisor feels that the high costs involved in developing cutting-edge technologies may or may not be a barrier for local insurers—it is too early to draw any inference they feel.

6. Emerging technological innovations in insurance are posing new challenges and questions to regulators. Conventional risk pool mechanisms may be challenged even as there is a move towards individualistic pricing approach with the use of wearables etc. Technology could also disrupt existing insurance business models. However, technology that aids more scientific pricing and facilitates ease of business for both the insurer and the insured ought to be encouraged. Regulators would need to understand how innovations work and should be able to facilitate innovations where the policyholder stands to benefit. Regulators ought to have proper technical resources, knowledge and skills to be able to deal with InsurTech. Regulators should also address concerns relating to collection and use of personal data.
7. The remit of the Working Group is to make recommendations relating to regulatory and supervisory framework in respect of InsurTech to the extent it relates to Risk Assessment, Risk Improvement, Product Design and Product Pricing. As far as risk assessment and risk improvement is concerned, technology facilitating this must be encouraged but impact on costs for the policyholder needs to be borne in mind—so any innovation must be preceded by a cost-benefit analysis. When it comes to product design and pricing, details of cognizance of usage of wearable/portable devices should be part of the product filing. Such products should first be tested in the sandbox environment (or on a pilot basis). Such an environment works within a well-defined space and duration. An important point here would be the transition strategy when the proposed product exits the sandbox environment. The regulatory framework may need to consider the standards of the devices. The consent of the customer to share data is a must for participation in such products.

I. Emergence of InsurTech

Financial Services, including insurance, are rapidly embracing changes; particularly those triggered by technology, known as 'Fintech'-'InsurTech' in the context of insurance. Given that the emerging technologies have considerably improved and streamlined customer acquisition, retention, operations and client communication, the stakeholders involved are keen to react soon. Indeed, technologically enabled financial innovation opens up the space for new business models, applications, processes and products.

II. Different Perspectives

Innovations in InsurTech come in from different sources, such as, the tech companies, media, the producers and distributors of products, and quite often, from the consumers themselves. Indeed, more and more consumers are showing the inclination to deal with non-traditional financial service providers. The younger generation, in particular, is always connected to the internet and seeks engagement with service providers through it. Insurers, on their part, are constantly looking to improving customer engagement, and IT provides them the right channel. Thus, insurers look to adapt to the changing scenario involving technology, which is pervading most of the activities involved in the product life-cycle in insurance. Insurers are looking at sophisticated data models and analytics to better identify, understand and quantify risk. For this reason, insurers are embracing innovation with a focus on data analytics. Insurers are looking at Big Data and are trying to work on predictive modelling. While this is the demand side perspective of InsurTech, when it comes to the supply side, there are several start-ups targeting the insurance sector. InsurTech has the potential to completely transform the insurance business; hence, regulation and supervision need to evolve in order to protect policyholders' interests, while also ensuring that innovation is not stifled.

III. Types of Innovation

There are several types of innovations that fall within the scope of InsurTech - Digital platforms, Internet of Things (IoT), Big Data, Comparators and Robo Advisers, Machine Learning, Artificial Intelligence (AI), Blockchain, P2P, and Usage Based. Apart from Social Media, technologies like IoT, Wearables, Blockchain, AI, Big Data, and Robotic Process Automations, all have their applications. The industry has witnessed considerable progress in the digitalization and robotic process automations space. Wearable technology has significantly improved in the last decade or so. From simple pedometers used to track steps, we now have medical grade technology based wearables, which can track advanced health and biometric parameters like oxygen intake (VO₂), heart rate and rhythm, blood pressure, and sleep quality, amongst others. Fitness trackers like Apple watch, Fitbit, Garmin, and many others

like them, can now track many advanced health parameters real time. A majority of the smart phones have capability to capture some of these parameters themselves and also are interconnected with the wearable devices through various apps.

IV. Life Insurance and InsurTech

In the Life Insurance context, health information forms a critical part of risk assessment. A person's health indicators, such as heart rate, exercise habits, blood pressure and other information obtained from wearable devices can be used to determine the health and fitness of the insured. These metrics can greatly aid in the assessment of life insurance risk, going beyond the traditional methods of risk assessment. Insurers could develop framework/ models using wearable data throughout the life cycle of the insured to not only build attractive product propositions but also to monitor experience throughout the policy term. These frameworks/ models can be used to better the health and fitness of a person, particularly if s/he is leading a sub-standard life. This will also help in significantly improving the mortality experience over a period of time.

V. Digital and Analytics in Life Insurance

Digital technology could extend the reach of life, annuities and pension coverage into largely untapped areas such as the younger and lower income segments, by reducing costs and allowing businesses to engage with customers in more compelling and relevant ways. Further, behavioural analytics and advanced data analysis capabilities can help insurance companies gain a deeper understanding of behavioural trends, customary aspects and habits of individuals, allowing for the development and creation of customised solutions, as also better real-time and fast-track customer services.

VI. Health Insurance and InsurTech

Today, in Health Insurance too, the same technology provides resources to regularly monitor and measure almost anything - from the number of steps taken by an individual on a given day, to his/her pulse rate, among other things, and these measures can then be stored digitally. With recent advancements in big data and analytics, these trivial measures can provide critical risk insights to an insurer regarding the health condition of the prospect. The data obtained serves both the end customer and the insurer. While the customer benefits from a healthier lifestyle, the insurers in turn can reduce their risk and incentivize the customers for good or healthy behaviour. Therefore, wherever required, the insurers can nudge the customer towards a healthier lifestyle; and moreover, they also will have the tools to better price their products with a high degree of predictability, based on the multitude of input parameters.

VII. Health Insurance Regulations 2016

The Health Insurance Regulations 2016 takes into account Wellness and Preventive aspects and allows insurers to incentivize the customer-based on fitness and wellness criteria. Post the regulations, many insurers have taken some initial steps and have introduced wellness features focusing on the overall health of the customer, rather than just providing financial support for episodic events. The Regulations deal with providing wellness benefits through OPD, pharmacy and health check-ups, along with guidance to insurers to offer discounts on premiums and renewals based on fitness and wellness criteria.

VIII. Non-life Insurance and InsurTech

In the context of non-life insurance, the main applications are Connected Cars, Advanced Driver Assistance Systems (ADAS), and Home Monitoring, apart from health monitoring etc. They also include the use of fitness bands, real-time weather observation etc., that include sensor analysis of the gathered data that can identify impending health problems, unsafe industrial equipment failure, and more.

IX. Blockchain

Blockchain is a state of the art technology that forms part of InsurTech and has relevance for risk assessment and improvement of products too. Blockchain, which had been in the testing mode, is now moving to production; it is moving from hype to reality even as insurers are realising its business uses. Very recently, there was a news item (Asia Insurance Review) that the first blockchain platform for Marine Insurance has gone 'live'. It talks of how the platform will transform the way global businesses in the marine industry manage risks across their organisations by connecting participants in a secure, private network with an accurate, immutable audit trail and services to execute processes. It is stated that this platform has established the first of its kind digital insurance value chain.

Blockchain or distributed registry technology is a digital ledger that stores active transaction data without intermediate control by using a consensus system to validate transactions. Blockchain operates on a principle of transparency for fixed record keeping. The possibilities of using blockchain technology in insurance are abundant. In its basic application, blockchain can be used in Internet of Things (IoT) product development, apart from fraud detection and claims processing. Blockchain can introduce an assurance standard across a number of suspicious contingents. Incorporating blockchain into the existing insurance procedures can allow for improved detection of fraudulent behaviour such as identity theft, misrepresented injury or damage claims and more. A blockchain system can also help insurers confirm customer authenticity, validate ownership, attest to the origin of property and documents like medical reports, monitor claims history, recognize identity-specific patterns of fraudulent behaviour, timestamp policy purchases, etc.

X. Investing in Technology

Insurers are keen on investing in technology as they fear the risk of disruption if they don't. Many insurers have dedicated teams to monitor new technologies to be able to understand their true potential for disruption. In future, for insurers, innovation should be part of the overall strategic agenda and be aligned with the company's objectives. While the new age insurers kick off in this manner, the long standing insurers are working on updating legacy systems to adapt to future environments and also innovate. They are looking to changing their IT culture from one that inhibits innovation to one that is agile and modern and one which will ensure that processes are smooth and new products and services are developed seamlessly.

XI. InsurTech and Insurers

A Global Fintech Survey carried out in June 2016 came out with some interesting findings—three in four insurance companies believe that some part of their business is at the risk of disruption. They realise that the new customer needs new products and services, and these necessitate deeper risk insights, which will drive innovation. Three in four industry players acknowledge ongoing disruption and most are dealing with Fintech.

While insurers recognize the importance of most Insurtech-related trends, they prefer to focus on commonly adopted ones, and are less responsive to other emerging waves of innovation. Insurance companies are investing in the design and implementation of more self-directed services for both customer acquisition and customer-servicing. Usage-based Insurance (UBI) models are emerging in response to customer demands for personalised insurance solutions.

XII. Mobile technology

When it comes to digital platforms, the story of mobiles is well known and indeed is experienced by a huge chunk of India's population. Mobile devices have become an integral part of our everyday lives and have caused a great deal of disruption in every area of business, including the financial service industry. Customer demands have significantly shifted, as the digital revolution is transforming the way we access financial products and services. The modern customer looks for the same digital experience from financial services, including insurance, which s/he gets from Google, Amazon, Facebook, Apple etc.

XIII. Adapting to change

Insurers do adopt different strategies to adapt to the quick-changing tech environments. They are open to change. They look for technological solutions, try to bring about a change in their organisational culture and are quick to identify areas for future growth. They know that to remain relevant in the

highly competitive market, they have to adapt to change. What is the impact of adoption of technology on the policyholder? In particular, what impact can technology have on risk assessment and product design.

We have witnessed the financial sector receiving a big boost due to technological integration. Customer experience and technology often go hand-in-hand. From purchasing a policy to raising a claim, the process is time consuming, resource driven, and paper intensive. Technology can address these concerns and make the customer experience very smooth and hassle free.

InsurTech is creating its own space within the FinTech segment. Convenience and ease of use are top priorities for the customers, and FinTech will assist insurance providers to reduce the barriers faced by customers in their online purchase journey.

The online environment is familiar to consumers as well as brands. With Insurtech ensuring digitization, insurance providers are able to meet insurance seekers in the online marketplace and hence communicate quickly. Dealing with the claim process used to be a tedious affair but today's tech-savvy climate enables speedy settlement of insurance claims.

XIV. Why Working Group on Tech Innovations

In the backdrop of a demand from several insurers to link wearables and portable devices to their product design, IRDAI, vide Order Ref. IRDA/NL/ORD/MISC/264/12/2017 dated 6th December, 2017 constituted a Working Group to examine "Innovations in insurance involving wearable/portable devices" to look into the various technological advancements in the context of risk assessment, risk improvement, product design and pricing. The use of technology in this area poses several questions relating to whether use of technology in risk assessment at an individual level will disrupt the conventional risk pooling concept to some extent? What are the risks relating to exclusion of certain categories of customers? What should be the approach with regard to data capture, collation, usage, privacy and confidentiality issues? Are these innovations adequately assessed and are they really beneficial? Are such business models viable? There could be concerns relating to market conduct. What about questions relating to moral hazard? How does one collaborate with other stakeholders? What should be the Regulator's role in encouraging innovation? In the context of the Terms of Reference that this Working Group has examined, it is the Internet of Things (IoT) that comes out as the most relevant technology that needs examination from a regulatory perspective. It is IoT that would impact risk assessment, risk improvement, product design and product pricing the most.

This report seeks to examine these aspects and more. The primary focus is on ensuring policyholder protection without stifling innovation triggered by technology in the area of risk assessment and product design.

I. Technology and Risk Analysis

Insurers are driven towards technology with the expectation that overall, it will help improve risk selection and reduce risks for them. They believe that technology will help them assess risks better. They look to obtain more and more data relating to the policyholder and expect such data to help them carry out better underwriting. When it comes to risk analysis, assessment and improvement, apart from IoT, it is Big Data that will come to their rescue. Data mining, Data analytics and Predictive Models are seen as a boon by insurers to understand better the risks they take on as part of their core business. Not only is individual policyholder data seen to be of help but also correlation with data pertaining to the external environment helps them deal with unforeseen contingencies better through greater preparedness facilitated by predictive analyses.

II. Use of Big Data, AI and ML for Underwriting

The use of Big Data involves the collecting, processing and using of high volumes of different types of data from various sources using various IT tools—powerful processors, software and algorithms—in order to get patterns or correlations, generate ideas, solutions or predict certain events or behaviours in a more accurate and timely manner. Artificial Intelligence and Machine Learning have great applications in risk assessment and risk improvement. Artificial Intelligence(AI) is defined as intelligence that is not the result of human cogitation—it is the result of exponential growth in computing power, memory capacity, cloud computing, distributed and parallel processing, open-source solutions and global connectivity, of both people and machines. Machine Learning (ML), a subset of Artificial Intelligence, is the science and engineering of making machines ‘learn’ by finding patterns in data in an automated manner, using sophisticated methods and algorithms. Together, AI and ML aim to embed human intelligence into machines, enabling systems to learn, adapt and develop solutions to problems on their own.

For underwriting purposes, AI and ML can help insurers and agents underwrite risk effectively, by using Big Data from customers that it has collected from multiple sources, many of them in real time. Through automation, pattern spotting and machine learning, AI can assist agents in sorting through information and identifying cases that pose higher risk.

In well-regulated markets, the compliance cost of underwriting risk is sufficiently high to deter most start-ups, causing InsurTech to focus largely on developing innovative distribution models instead and partnering with incumbents to underwrite the risk. Though technology is steadily advancing, it is

yet to demonstrate the areas in which it will affect large-scale businesses. Driverless vehicles and DLT are some early examples of material evolutions. Some existing trends are still minor, but could gain critical mass in the future to succeed on a larger scale.

III. Life Insurance

The concept of using wearable devices for better risk assessment of the health of an individual is not new for Life Insurance. It has been in vogue for over a decade. It perhaps started with Corporate Wellness Programmes to help employees track their own fitness, but insurers quickly spotted its usefulness in keeping track of the health of the insured. Infact, the use of fitness devices helped these corporate houses to get a discount on the health insurance programme of their employees. Several corporate houses distribute fitness tracking devices to their employees as part of integrated wellness programmes. There are examples of corporate houses having benefitted in getting discounts on their insurance premium as a result of their wellness programmes and tracking of fitness of their employees. For instance, Appirio, a San Francisco based cloud computing consultancy is said to have got a 5% discount (amounting to US\$300,000!) on their insurance premium in 2014. So, apparently, wellness programmes do help in improving health parameters, and in turn have helped corporates get predetermined discounts.

Insurers may develop frameworks/models using wearable data throughout the life cycle of the insured and help in building attractive product propositions, and also monitor experience throughout policy term. These frameworks/ models could be used to better the health and fitness of lives, particularly a sub-standard life. This will help in significantly improving the mortality experience over a period of time. Insurance companies could build their own infrastructure for storing and analysing the wearables data or can tie-up with service providers. Wearable devices are continuously evolving and will become more and more accurate. Customers may migrate to another device or to a superior device. There is no common way of assessing the health scores across the spectrum of various technologies. Hence, a framework based on minimal available data to cater to the constant changes in this space has to be devised.

IV. Health Insurance

The usage of wearables data in health insurance will have a critical role in risk assessment and improvement. Currently, insurers merely have access to a point-in-time data through medical tests or self-disclosures, which are often not adequate for risk assessment on an ongoing basis. The lack of electronic health records or any other common repository of health data makes the process of risk assessment even more challenging. Also, today, once a customer is on-boarded by an insurer, the insurer has no effective way of tracking and promoting healthy living.

Wearables can play a crucial role in this setting by providing a regular stream of health data to the insurer. With increasing sedentary lifestyles and rising incidence of lifestyle diseases, the data captured by wearables (e.g., daily active steps, sleep hours, quality of sleep etc.) is expected to have a significant bearing on diseases incidence rates and thereby claim costs. The data captured by wearables will be a good indicator of a customer's health and can help insurers better price the risk and even provide financial incentives to healthier customers. The availability of real time data on an ongoing basis will help the insurers price the risk as it changes over time. For example, the pricing of the renewal premium can be altered on the basis of the levels of control maintained in blood sugar levels for a diabetic customer. However, the product design would have to ensure that the parameters for discount/loading are well defined and the claim status has no bearing on the premium.

In recent years there have been significant advances in devices that capture activity and health related data. Though fitness trackers form the bulk of wearables devices in the market, there are many other devices in the market that track disease specific parameters. As technology advances and more and more users get access to smartphone apps, there is expected to be a significant increase in the adoption of these devices by consumers. Hence, it would be prudent to not specify the allowed device categories as part of the regulations. The risk to customers can be contained by limiting the usage to non-invasive devices.

Key Wearable Device Categories

Type of Wearable	Description	Key Players
Fitness Tracer	Most common form of wearable devices and are used for tracking fitness related metrics e.g. distance walked, sleep time, heart rate etc.	
Skin Patch Sensors	Health tracking sensors that stick to skin and are used for fitness monitoring, glucose level monitoring through sweat among other uses.	
Smart contact Lenses	Product under advanced stage with patents filed by both Samsung and Google, can provide ability for continuous glucose monitoring and intraocular pressure monitoring for glaucoma patients	
Medical E-Textiles	Textiles with integrated sensors used for tracking patient vitals and have also been used for drug delivery.	
Implantable Devices	Consists of devices for cardiovascular treatment & monitoring and new age devices like digital pills which are introduced surgically or medically into human body.	

A study carried out by Vitality of South Africa revealed some interesting results:

- (a) Participation in health and fitness programmes reduces health claims by 16%
- (b) Logging fitness activities reduces risk by 22% for the unhealthiest category of participants
- (c) Participating members are upto 64% less likely to lapse their insurance than non-participants; and
- (d) Participating members have upto 53% lower mortality rate than non-participants.

These results would imply that the extent of participation becomes important and such programmes are indeed voluntary. It is interesting to note that in some programmes, penalty is envisaged where members did not reach the desired targets. There are instances of the cost of device being deducted from the salary as well!

V. Non-life Insurance

Until now, underwriting and pricing were based on analytics and mathematical models using limited data points such as previous policy details, declaration by customer on previous health history while issuing the policy, current health report, etc. Thus, the conclusions derived from such limited data with respect to good risk and bad risk may not be the most appropriate. Over the last decade, however, revolutionary advances in computing technology and the explosion of new digital data sources have expanded and reinvented the core disciplines of insurance. Advanced analytics in insurance has gone much further than traditional underwriting and actuarial science, in its search to derive more meaningful insights from data. Data mining and predictive modelling are the way forward for insurers for improving pricing and segmentation, and becoming more customer centric.

Use of InsurTech would improve risk in the following ways:

1) Improve Assessment of Underwriting Risk:

In Motor Insurance for instance, insurers can track driving habits via telematics and IoT devices to conduct a smarter risk assessment. Using the digital platform, insurers can further identify whether the drivers are likely to be involved in an accident by tracking their driving habits and previous violation data and charge premium accordingly. For example, when a customer wants to port his/her motor policy from one insurer to the other, the insurers may share the motor related data collected by the first insurer from the customer amongst themselves, using the block chain technology. Such collaboration between insurance companies would make underwriting more robust.

2) Fraud Risk:

IoT and AI would make available more data, thus making it feasible to detect fraudulent claims in the least possible time. Different triggers indicating frauds can be identified and run against all claims filed, in order to recognize suspected fraud claims. This would reduce the liability of the insurer, and

the benefit of this would be passed on to the customers through lower premiums. For instance, previous claims data for all vehicles and flagging of total loss/theft of vehicles is available with the IIB. It may become possible to acquire this data through a web integration in order to identify fraud proposals which come for underwriting, in terms of wrong NCB declaration or proposal for a vehicle which has previously been claimed for total loss.

3) Promoting Better Social Behaviour& Reducing Risk:

Driving feedback based on telematics data can be used to share tips to customers to improve their driving habits, and thereby help in avoiding accidents. Thus, these devices would ultimately reduce the risk that insurance companies are exposed to. Insurers could also offer incentives to customers in connection with usage of portable devices that would help improve the risk.

4) Betterment in Claim Handling:

Faster claim settlement can be offered using IoT and AI. For example, in Motor Insurance, claims can be settled by asking the customer to fill details about the accident using a chatbot/voicebot, upload photographs of the damaged vehicle and of the essential documents to verify the claim, and the amount is directly credited to the customer's account. A similar methodology can be adopted for other LOBs like health.

I. InsurTech and Product Design

The use of technology will have an impact on the product design and the efficiency of inclusive insurance delivery, as well as on the participants and their roles in the overall value chain. All these aspects hold great potential and promise for possibly extending access to insurance for many more that were previously precluded from such access due to the traditional business models. It also poses specific challenges to insurers who need to strike a balance between policyholder protection and market objectives in an evolving environment using technical solutions and involving multiple parties in and outside the insurance sector. Extending the reach of insurance coverage more widely and the complexity of some of the business models to be used for the same would also present a number of risks, which may affect different stakeholders differently, depending upon their risk appetite.

II. Life Insurance Product Design

Life Insurance companies may consider launching specific products where the pricing may be decided on the basis of wearables and data generated from them, or can enable an option in their products to have premiums linked with the dataset or outputs from technologies such as wearables.

Products could be designed such that the wearables data can be used to determine the customer health during initial underwriting and at subsequent annual renewals. The discounts computation and assumptions may need to be filed along with the File and Use product document. However, due to the evolving nature of these gadgets, there has to be flexibility for reviewing the premiums priced through these platforms as the lifetime fixed premiums may not work.

Product and benefit offering could be directly linked to the performance & progress of the individual's health score

Pricing could also be based on the consistency of the health score during the term of the product / policy (based on pre-fixed health metric) such as:

- a. Discount in future premiums on improved health score
- b. Level pricing for no change
- c. Additional/extra pricing for lower or worsening health score trends may also be considered

Tangible rewards like discounts on health products for progressing health scores may be offered by the providers. However, at this stage, the customers could choose either of the approved providers for the gadgets.

Customers could voluntarily consent to link their policies/ new products to their existing devices. Alternatively, companies can tie-up with devices manufacturers to handout wearable devices to their customers. The procedure for selection and approval of devices, may shift from one manufacturer to another, and would therefore need to be examined; but the arrangement may be direct between the device manufacturer and insured. However, the level and protocol for sharing of information and its extent would need to be driven by the relevant regulatory framework. The products can evolve and be tested in a sandbox environment before fully going live.

III. Health Insurance Product Design

The key perspectives when it comes to product design and pricing in health insurance would include:

- (i) Device Procurement and Distribution, however this may be allowed to be taken by the insured from any of the approved providers
- (ii) Allowed Benefits
- (iii) Benefits Accrual and Redemption
- (iv) Pilot Products, which may be allowed to both Life and Non-life Insurers
- (v) Portability, wherever possible

(i) Device Procurement and Distribution

Insurers could partner with device manufacturers (adhering to certain minimum standards and requirements as approved), from which their customer can obtain the device and the insurers would be able to access the data captured by the device. Customers could have the choice of purchasing the device from the device manufacturer or use her/his existing device which conforms to the standard laid down. Hence, it would be clearly specified as to the nature of information which can be captured for the purpose of the insurance product. The provider shall capture and give the insurance companies only the specified information, and the privacy of data arrangement will be directly between the insured and the provider. The provider would be liable for any breach of trust on the procurement levels and usage of customer information mandated to them.

Case in Point

Vitality UK offers options to customers to choose devices from multiple partners (e.g., Apple, Garmin, Fitbit, Nokia etc.). The insurer provides links to different device partners on its website. The device partners in turn offer discounts to Vitality customers.



Apple Health app

Link the Apple Health app on iPhone or Apple Watch to Vitality using the [Vitality Member app](#) and you'll be able to earn Vitality points for tracking your activity. You'll need an iPhone 5s or later with iOS 8 or later to use the Vitality Member app.

[Find out more](#)

Garmin

With up to 40% off a range of devices, Garmin devices are designed for running or cycling. They also have a comprehensive range of activity trackers for measuring your daily steps. P&P applies.

[Learn more](#)



Polar

With 40% off some devices, Polar web-enabled heart-rate trackers are ideal for more committed athletes to monitor their training intensity, when worn with a chest strap. P&P applies.

[Learn more](#)

Fitbit

A range of wrist, belt and pocket web-enabled [devices that track your steps or heart rate](#). Prices are from around #50 but you can also track your steps for free with the Fitbit app for iPhone 5s or above.



Misfit

[Misfit](#) has a range of devices that track your steps. There are options for your wrist, belt and pocket and all have wireless sync. Prices start from around #40.

Nokia

[Get a quote](#)



Source: <https://www.vitality.co.uk/rewards/partners/activity-tracking/>

(ii) Allowed Benefits

The insurer could offer the following benefits such as those mentioned below but not limited to the data captured from the device and health risk assessment:

- Providing insurance premium discounts based on objective criteria such as activity levels, lifestyle changes, dietary habits etc.
- Offering health and wellness services which would include OPD, pharmaceuticals and health check-ups from network providers along with other services of gyms/fitness training centres, and dietician services.

(iii) Benefits Accrual and Redemption

The criteria for offering additional benefits and services based on wearables data needs to be clearly outlined as part of a benefits table in the product T&C. The benefits table would clearly link wearable data thresholds to benefits offered to the customer. The insurers can also offer a point-based reward accrual and redemption system, wherein activity thresholds are linked to reward points and the rewards points in turn can be redeemed for allowed benefits. This would help in the gamification of healthy living and incentivize customers to have a healthier lifestyle. The insurers could offer multiple benefits options to the customer from the list of permissible services based on customer activity data / accrued points obtained from the wearable.

To increase adoption and nudge customers towards a healthy life, the insurers could be allowed to set benefits accrual and redemption frequency at either monthly, six-monthly or yearly intervals.

Case in Point

Vitality UK provides a points accrual table to customers linking different activities to reward points. These reward points can then be redeemed by customer against select services.

8 Vitality activity points	5 Vitality activity points	3 Vitality activity points
12,500 steps tracked in a day	10,000 steps traced in a day	7,000 steps traced in a day
30 minutes at 70% max heart rate	Partner gym visit	
60 minutes at 60% max heart rate	30-59 minutes at 60% maximum heart rate	
30+ minutes at 600kcal burned per hour (300kcal)	30-59 minutes at 300 kcals burned per hour (150kCal)	
60+ minutes at 300kcal burned per hour (300kcal)	30-50 minutes cycling using moves app	
30 minutes running using moves app	parkrun volunteer	
60+ minutes cycling using moves app		
parkrun		

Source: <https://www.vitality.co.uk/rewards/partners/activity-tracking/>

(iv) Pilot Products

Currently, since insurers lack health data linked to wearables, it may be difficult for them to quantify and link claims experience with metrics obtained from wearables. In such a scenario, pilot products could be offered.

(v) Portability

There ought to be portability of data from one insurer to another. But benefits based on wearables data can vary from insurer to insurer and there might be variations in data elements captured across insurers. This would need to be addressed. The problem of sharing of wearables data between insurers can probably be overcome through a block chain based solution and would need to be further examined for viability. Insurers may also explore accessing prior data directly from the service provider with the prior consent of the policyholder.

IV. Non-life Insurance Product Design

The rapidly evolving financial technology industry is increasingly influencing the way businesses are done. Insurance companies are looking for innovative products, alternative means for delivering their products to the customers and bundling of value added services along with their products, for the benefit of the customers.

(i). Modular Products

The way forward could be modular products so that the customer can customize his/her insurance plans. S/he would take only those covers which are required by her/him, instead of a bundled product with several mandatory covers. Using IoT, even insurers may pitch customized plans to customers.

(ii). Pay as you Go Concept

Customers have varying needs which can't be addressed by traditional products, for example:

- Some customers only use their car on weekends, and only want on-road coverage during weekends
- Only a few home insurance customers need theft coverage when they go on vacations

(iii) Telematics in Motor Insurance

By installing smart data collection devices in vehicles, it would be possible for insurers to collect data on the driving habits of customers. To increase the adoption rate, insurers could incentivize the customers on the basis of their driving behaviour and give discounts on the next retail product that s/he buys. This will drive the cross sell opportunity for insurers and provide benefit to the consumer. With

millennials becoming the biggest customers, a paperless policy issuance/claims settlement process is a necessity. Communication with such customers for such policies would be digital, often using smart phones.

(iv) Value Added Services (VAS) as a By-Product:

Insurers should be allowed to provide VAS using IoT as a by-product and to recover the cost of the device in the product pricing by explicitly mentioning it in the document. This would also encourage preventive maintenance of their assets like cars, safe driving habits, and a healthy life style.

Examples of VAS would be:

- a) Remote Control Facility to have control over home appliances remotely, such as checking security systems or switching on/off lights.
- b) Home insurance policies to provide services for problems such as minor repairs for water supply, electrical work, gas supply line work, small workmanship required for furniture, etc.
- c) In case of solar energy generation plants: High value assets are at work in the open and remote areas where it may not be possible to wall-fence such assets for protection from intrusion, theft, etc. An IoT based device can be used for such security.
- d) Open architecture model (OAM) should be allowed as part of Insurance, which would work with multiple devices (OEMs), which would give freedom to the consumer to choose his own device by which to share data.
- e) Flexibility to provide devices along with the Insurance Plan: The insurer should have the flexibility to recover the cost of the device as a part of the premium or give the device free with the policy.
- f) Non-Monetary Benefits to Settle Claims: Products with flexible coverages and claim benefit could be introduced. The benefits may not be restricted to monetary amount and may contain added coverages, such as access to airport lounges, coupons to a restaurant or movie, membership to clubs, etc
- g) As there is a rapid change in technology/smart devices, the insurer should be allowed the freedom to vary the device/incentive program on a yearly basis.

(v) Home Insurance

In this connected world, home is the first place where it all begins. Every single need is being addressed via a single tap on mobile phones, may it be FMCG products, cars, bikes, machines, toys, or even healthcare products. Insurance can't be left behind in this machine economy. From life to autos to rentals to theft, just about every insurance category is seeing "disruption".

Traditional insurance policies cover fire, earthquake and damages due to natural calamities, which are rare occurrences. People need insurance to take care of the things that they use in daily lives, the things that they value the most. For instance, the loss of a smartphone worth 10k is a more painful over a home worth 50 lakhs – this may sound weird, but it is a fact.

With Insurtech, Home Insurance policies will take care of physical perils, family concerns and convenience concern, including:

- i. For physical perils, a central IoT and AI based device that understands nuances and abnormal activities in the house and triggers SMS or calls automatically, for e.g., thermostat to send out any signal if there is smoke/fire in the house (SMS/ buzzer also can be triggered on the house owner's phone).
- ii. Movement Sensor in an empty house to track any unsolicited intrusion in the house etc.
- iii. A home fitted with such device would help loss minimization by way of early intimation and quick response for loss minimization. e.g., alarm sensors on gas leakage would save bigger loss of property and lives
- iv. Collaboration with service providers for immediate assistance through IoT devices, if seamless, would provide a complete Home Insurance experience for the customer. Problems like minor repairs for water supply, electrical work, gas supply line work, small workmanship required for furniture, etc. need to be considered.

Apart from these, customers have varying needs which can't be addressed by traditional products. Pay as you go insurance needs to be tried out. e.g. Home insurance availed by customer for burglary is more beneficial for the customers when they are away. The traditional product covers it yearlong, and if the house is occupied for 80% of the time the actual risk is only 20%, so a customer becomes apprehensive while buying such policies.

To ensure that such policies are not used fraudulently, bundling of devices with insurance policies will help in risk avoidance and risk mitigation as well.

• **GLOBAL BENCHMARKING**

- Erie Insurance in USA has successfully piloted use of Google glass for its claims adjusters for home and auto claims. They also cover the service line protection (electricity).
- Tailored home insurance will help insured to have an insurance for the things they love the most. Lemonade is a property insurance company that offers exactly that. They insure almost everything that is at home.

- Neos is a London-based start-up that packages together best-in-class IoT enabled hardware, 24/7 support and unlimited building and contents home insurance, all managed from a mobile app. From the app, customers can look at dashboards or live camera feeds, respond to issues like an intruder alert or a leak and contact the Neos team to get a professional sent out for response.

V. Product Pricing

- a. Dynamic Pricing: Its aim is not to maximise short-term profits but provide tools for optimising the portfolio by making it balanced and sustainable.
- b. Varying the pricing on the basis of certain parameters such as driving behaviour, which are likely to be very dynamic in nature, is tricky. Robust systems are required to be in place to manage such dynamic shift in rates. Also, they would require to be monitored regularly to avoid any surprises.
- c. Customer value projections would require predictive models to accurately forecast the true risk, the policyholder's propensity to hold or buy (churn and conversion), and the actual behaviour of the policyholder: claim frequency, customer service requirements, channel usage, and other products owned.
- d. External prices also influence the discount an insurer is willing to offer their customer to prevent him from switching to, or buying from, the competition, if this is valuable on a portfolio level and in line with the strategic objectives.
- e. The insurance companies should not load too much/little margins into their products. Instead, if required, they can file the product as pilot product. Even if the policy is for a complete year, the insurer should have the option to vary the premium over the duration of the policy, or take the premium in instalments.
- f. The technological advancements would carry additional risks. Insurers would need to ensure that they are adequately covered to write such newer risks. They can go for appropriate re-insurance or limit the exposure to certain customers for innovative products.

VI. Market Conduct and Related Aspects (including moral hazard)

(i) Pricing Challenges

In the initial years, there are bound to be few challenges with regard to pricing of wearables products, specifically related to benefits based on collected data. Any decision regarding benefits would be based on a limited data set and the industry as a whole will go through a learning process.

The critical piece of the wearables puzzle is linking wearable metrics to claims experience. To derive any meaningful correlation between these two pieces would require substantial data points. But given the limited wearable users in the country, it is unlikely that any one insurer would have the sufficient data set to derive such insights. This problem can be overcome by leveraging the services of reinsurers or other third parties (e.g., Insurance Information Bureau of India), which can pool data from different insurers and derive insights.

(ii) Customer Fraud

There is great degree of risk for insurers with regards to customer fraud as the insurer has no fool-proof way of ensuring that the device is used by its customer. This is more of an operational risk and can be mitigated to some extent by linking wearable devices to mobile numbers.

The regulations should provide suitable safeguards to insurers to address such abuse and allow for the rescinding of wearables related benefits in case of such events.

(iii) Data Misuse

There can be potential challenges if insurers use the data gathered from wearables or portables for purposes other than those permitted. Since customers are expected to use these devices on a regular basis, the insurer would have a fair amount of detailed data regarding each customer (e.g., location history, sleep time, etc.), which is not exactly related to her/his health and wellness, for instance. Insurers shall develop robust internal monitoring mechanisms to ensure that data leakages do not take place as this data could be misused for monetary benefits (e.g., sending promotional offers to customer based on his location etc.).

VII. Data Security and Data Mining

(i) Data Collection Methodology

There are broadly two systems and frameworks used for data collection – proprietary and third-party / open source systems.

Proprietary systems can be found as wearable devices, apps for smartphones and computers, and cloud services. These systems are provided and maintained by wearable vendors to collect users' data, to perform analytics and to provide data and analytic results to users, and to authorized third-parties.

Third-party systems such as services, apps for smartphones and wearables, and programmes for computers can be developed and maintained by external entities to provide specific functionalities. Each one of these components is intended to perform some specific functions:

- **Data collection:** Data is captured by the sensors available in wearable devices, smartphones and other portable devices.
- **Data transfer:** Data collected in wearables or other portable devices can be transferred to a computer or to a smartphone as an intermediate step towards its eventual transfer to a permanent data storage. This transfer can be produced through proprietary solutions or using third-party apps and programs.
- **Permanent data storage:** This function is related to the permanent storage of the data, which is usually performed in proprietary servers, where third parties and final users can gain access to the data.
- **Data analysis:** This is related to the analytical processing of data to provide results of interest. Typically, this processing is performed in servers, both proprietary and third-party. In order to perform the transfer of data to the third-party server, several options can be available depending on the wearable.

The data captured by the device manufacturer should be outside the purview of IRDA's regulations, but any data captured by the insurer should be managed as per the framework laid down.

(ii). Data Privacy – Key Principles

With regard to securing wearables data, the regulations could broadly be similar to the extant framework on customer data. Specifically, the regulations would need to address the following aspects for data: (a) Consent, (b) Usage, (c) Customer Access, and (d) Disclosure

(a) Consent

Insurance companies need to ensure that all data obtained from the customer is as per his/her consent. Customers should also be given an option to change their consent at a later stage. Insurers need to provide a notice to the customer detailing the data elements they would be accessing from the device and the usage of that data.

(b) Usage

The data collected by the insurer should be used as per the notice given to the customer. The regulations ought to have appropriate safeguards to prevent the misuse of data for any purpose other than the stated objective in the notice given to the customer.

(c) Customer Access

The insurer should provide a portal/app to the customer to access her/his wearables data and ensure that there is complete transparency with regards to benefits offered to the customer and her/his wearables/portable device data.

(d) Disclosure

The insurer should not share the wearables data with any third-party, except as permitted in the extant framework. Even at the time of portability, the insurer may share this data only with the explicit consent of the customer.

(iii) Data Mining

There could be exceptions for sharing anonymized data with third-parties for analytical services, provided that they meet with the principles of the framework laid down. Given that there is limited empirical evidence linking wearable data to claims experience, it is essential to build an actuarial framework tying up the two pieces. This framework would be critical for risk assessment decisions and providing benefits to customers based on wearables or portable device data.

With limited penetration of wearable/portable devices, an individual insurer is expected to have minimal data even after a few years of adoption of wearables/ portable device based insurance policies. Thus, it would be critical to involve third-parties which can perform actuarial analytics on an aggregate basis by collating wearables/portable devices and claims data on an anonymized basis across insurers. An agency like Insurance Information Bureau (IIB) could potentially perform this exercise.

(iv) Blockchain Technology

As already mentioned, Blockchain can be an effective enabler in building a robust wellness ecosystem that connects disparate systems in the wearable fintech and health insurance industry together and addresses the flow of information in a secure manner. Blockchain is a continuously growing list of records, called blocks, which are linked and secured using cryptography. By design, Blockchains are inherently resistant to modification of the data, which makes them suitable for the recording of events, fitness records, and other records management activities, such as identity management & transaction processing.

Organizations could implement a permissioned Blockchain that enables only the intended users to validate the block transactions.

Key Benefits of Blockchain for consumers and insurers:

- Distributed, secure access to patient health data, which can be controlled by them through permissioned Blockchain
- Shared data enables near real-time updates across the network to all parties, which improves service delivery and reduces time of claims settlement.

A case in point is IBM's Watson Health artificial intelligence unit that has signed a two-year joint-development agreement with the U.S. Food and Drug Administration (FDA) to explore using the Blockchain technology for medical research.

Insurance companies could be allowed to develop a consortium for Blockchain technology as it will help portability.

I. United Kingdom

In the UK, the Financial Conduct Authority (FCA) and the Bank of England (the prudential regulator) have brought together experts of many disciplines to monitor FinTech developments in what it calls a “community of interest”. This community is building up knowledge, through the experience of its diverse participating experts. The community is responsible for organising regular supervisory forums, where experts from across the Bank monitor and discuss evolving market trends and invite experts to provide their views. To date, the group has been engaged in (1) assessing whether current supervisory structures are adequate to assess and respond to the changing risk profile presented by InsurTech; (2) producing internal papers that compare reported developments with supervisory experience from the regulated forms; and (3) initiating research such as the potential impact from autonomous vehicles on the insurance sector. The Bank of England also runs a FinTech accelerator—this works in partnership with technology firms to explore how FinTech innovations could be used to support central banking operations and general supervision.

UK’s Financial Conduct Authority (FCA) is the conduct regulator for financial service firms and financial markets in the UK and is responsible for ensuring fair treatment of the customers. The FCA’s innovation department has two main objectives:

1. **Policy engagement:** This means scanning the horizon for start-ups and engaging with the InsurTech community to have an ear to the ground, and to hear about potential issues and barriers to entry. This allows the FCA to react on time to developments, and is an outward-facing activity.
2. **Services for InsurTech firms:** Providing advisory services to beginning start-ups, it allows the FCA to have a deep understanding of what is happening in the market, and how these developments interact with the regulatory regime. The services provided include: (a) **Direct support:** The Direct Support team provides a dedicated contact for innovator businesses that are considering applying for authorisation or a variation of permission, need support when doing so, or do not need to be authorised but could benefit from FCA support. If a firm is eligible for Direct Support, the FCA will establish the most appropriate form of support, such as when a firm is seeking to introduce a new measure to the market and they are unsure how this fits in with the regulatory framework, or they have questions about how to get authorisation, they can ask these questions to the FCA; (b) **Regulatory sandbox initiative:** provides a live testing environment for companies who want to test a new idea on a small scale on live consumers. To qualify for the regulatory sandbox, the FCA first investigates if the suggested product is of real benefit, is genuinely innovative, has a need to test in the sandbox and is ready to conduct its test. If this is the case, and its merits testing, then the FCA can issue a restricted authorisation, which includes limits on the activities which the firm can perform and for a limited time only (six months). This includes limits on the volume and nature of business. This allows the FCA to

monitor how the product interacts with customers in the market. Individual case officers work closely with the firm to make sure that the supervisory authority is comfortable with the test project and that the company is also benefitting from the programme. There would be a weekly reporting mechanism and at the end of 6 months a conclusion and assessment would be performed, wherein it would be decided whether the pilot is ready to exit the sandbox.

So far, companies applying for help to the FCA have had very little interest in underwriting any risk themselves, and prefer to take up the role of an intermediary which passes the risk to the incumbent insurers. The innovative nature of these business models often makes it harder for large firms to evaluate them within the ambit of their existing risk appetite and procurement processes. Most InsurTech firms currently focus on the user experience, optimizing the delivery of traditional insurance products. They simplify the customer's journey and use technology to let the customers better manage their own risks.

This work requires a lot of interdepartmental interaction within the FCA. Though it requires intensive supervisory resources (compared to the size of the companies), the interactions it generates also allow the FCA to better analyse whether its own rules are fit for the purpose.

On the question of whether, when companies are part of the regulatory sandbox, the same prudential and conduct of business requirements are applied, it was noted that the FCA applies the same regulatory requirements. The Bank of England has also stated that upfront engagement with firms is very helpful further down the line, and while they do interact disproportionately with small companies in order to help them understand the various requirements, the capital requirements are never reduced.

II. Germany

BaFin takes a “technologically neutral” approach to emerging InsurTech. This means that they are supervised according to the strict functions they perform, without according them any special treatment due to their innovative nature. Risk carriers are treated as insurers, distribution channels as intermediaries (which fall outside of BaFin's supervisory scope), and outsourcing rules apply without exceptions. BaFin is generating expertise in supervision of IT, but this does not constitute a sufficiently different supervisory category to merit separate treatment. If there is any doubt whether the company is an insurer or an intermediary, it is analysed and a decision is made on a case-by-case basis.

III. Mexico

The Mexican supervisor feels that the high costs involved in developing some cutting-edge technologies may or may not be a barrier for entry for small and local insurers, thereby causing market concentration. They feel that it is too early to draw any inference regarding this. Initial investment costs are significant, but with time they tend to reduce. Further, it is not only about costs but also about demand and supply.

The Mexican supervisor is of the view that it is too early to talk of regulations to supervise InsurTech and that at the moment InsurTech start-ups should be treated under the existing supervisory approaches, commensurate with their nature of activity.

According to the Mexican supervisor, in Non-life insurance, advanced technology is expected to improve the ability to capture risk. However, in the case of Life and Health insurance coverage, some technological innovations designed to capture the individualized risk profiles could cause exclusion and discrimination. Supervisors should keep this in mind when implementing public policies to protect personal data in order to avoid financial exclusion.

On the question of when a start-up provides several parts of the insurance value chain, how to determine whether they should be supervised like an intermediary or an insurer, the Mexican supervisor responded that the dividing line is usually at the point of taking on risk. If a start-up underwrites risk, it should be subject to prudential requirements like an insurer, including the setup of technical provisions.

IV. Latin America

In Latin America, InsurTech start-ups are developing new distribution channels, price comparison tools and aggregation methods. It is expected that this will evolve in the future.

V. Europe

The concept of mHealth(mobile health) is in vogue in Europe.It is a general term for the use of mobile phones and other wireless technology in medical care, to educate consumers about preventive health care services.

VI. United States of America

Oscar Health Insurance, a New York based health insurance company has partnered with Misfit, makers of fitness-tracking wearables, to create a member programme that directly links biometric data to their health insurance coverage. From the website of this Insurer, it is observed that the Insurer made available an app to its policyholders to track steps on the app. It is specified that the policyholder will earn US\$1 towards (up to US\$240 a year) an Amazon Gift Card every day when the policyholder reaches the step goal. It is reported that Oscar could potentially save many thousands in health insurance coverage by promoting healthier lifestyles amongst its policyholders.

VII. Miscellaneous

With regard to practices adopted by various other insurers outside India the following are some of relevant practices to be considered (refer – Observations column in below table).

Insurance Company	Country	Fitness Tracker	Rewards	Observations
Oscar Health	US	Any tracker working with Apple HealthKit	\$1 credit every time a step goal is reached upto \$100 in Amazon vouchers	These are offered through company's App, but allowed to be linked to the Apps of Apple / Samsung. There is no reference that these offerings are linked to external devices.
John Hancock	US	Fitbit	Upto 15% premium discount for achieving targets	This is a life insurance company. Under the programme designed by the Life Insurer, the participants can use FitBits along with iOS devices to track healthy behaviours such as regular health exams, exercise, and smoking-cessation programs to earn "Vitality points" on a scaled system which could be anything from 30 points a day to regular exercise to 400 points. Those accruing enough points could receive a 15 percent discount on their insurance policy, which amounts to a savings of roughly US\$91 annually, along with other rewards such as restaurant and shopping discounts. There is no reference as to whether the Insurer is supplying the Device along with the product or the Device is embedded to the product.
Vitality	UK	Multiple trackers	Various reward schemes based on activity	Vitality integrates with hundreds of popular devices. It is understood that the members have a choice of selection of device.
United Healthcare	US	Fitbit	Offers health management app linking to Fitbit	UnitedHealthcare Motion® is an innovative wellness programme that combines wearable activity trackers with financial incentives, enabling people to walk their way to improved health and more than US\$1,000 per year in rewards. Thus, it appears that the policyholders are not provided with the Fitbits / wearable devices by the Insurer.

Aetna	US	Multiple trackers	Offered via corporate employer partners	Multiple trackers, not necessarily the one that is provided by the Insurer.
Cigna	US	Multiple trackers	Offered via corporate employer partners	Multiple trackers, not necessarily the one that is provided by the Insurer.

Source: http://institute.swissre.com/research/library/Medical_Wearables_Kelvyn_Young.html

I. Evolving a regulatory framework for InsurTech

1. Emerging technological innovations in the insurance value chain are confronting supervisors with new questions and challenges. Consumer needs have evolved, distribution channels have digitalised, the Internet of Things is affecting how risk is underwritten and predicted, and Peer-to-Peer technology is set to affect claims management.
2. What is necessary for regulators and supervisors is to understand technological innovations and unlocking their potential benefits to the insurance market, increasing the inclusiveness of the insurance sector, and maintaining the conditions for a fair, safe and stable insurance sector for the benefit and protection of policyholders. Since InsurTech will have a significant impact on insurers' business models, regulation, together with supervision will need to evolve to ensure the right balance between maintaining policyholder protection without stifling innovation.
3. Some of the innovations may disrupt the conventional risk pooling mechanism that is common to insurance. The collection of data on insurer risk or policyholders may enable a more granular risk categorisation that creates a breakdown of the current risk pooling principles and may lead to issues around affordability of certain insurance products, possibly even leading to exclusion of a certain section of risks or individuals. This seems to be a valid concern. The role of the supervisor, first and foremost, is to identify such a trend if and when this occurs and raise awareness at the appropriate policy levels. The objective would be to ensure that the industry prevents any such exclusion by providing alternatives to those likely to get excluded.
4. Technology could disrupt the insurance business model and the insurer landscape. For instance, it is desirable that insurers effectively maintain the overall customer relationship and leverage technology firms for their own advantage—in this scenario the insurance value chain is increasingly disaggregated such that insurers may no longer own the customer relationship and instead rely on business relationships with technology firms or service providers for premium income. The other major concern is that big technology firms leverage their technology and analytical advantage to squeeze out traditional insurers.
5. Current reporting requirements and/or frameworks may need to be refined in order to capture additional information to monitor potential for increasing interconnectedness—for example, data storage providers.

The regulatory perimeter may have to be reassessed to ensure that consumers are adequately protected and that regulators continue to have the ability to monitor market trends. As the risk profile changes it would be necessary to ensure that regulatory capital framework continues to adequately capture the changing risk profile.

II. Challenges in Supervision

Insurance supervisors may face the following challenges in the near future:

1. Supervisors need to understand how innovations work and are applied, if they are to ensure adequate assessment of new products and business models.
2. Supervisors will also need to balance the risks of new innovations against the benefits for policyholders and the insurance sector as a whole, such as, facilitating higher penetration, and consider how to create the proper environment to foster innovation, for example, through regulatory sandboxes for innovation hubs.
3. Supervisors and policymakers will need to evaluate and, where appropriate, adjust their regulatory framework from a prudential and conduct of business perspective to adequately address changed risk and business models.
4. Supervisors need to arrange proper technical resources, knowledge and skills to be able to deal with InsurTech in the future. The collaboration with other stakeholders needs to be stepped up to build and maintain an adequate understanding of innovations.
5. The trends in technology have many potential benefits that align with supervisory objectives. The InsurTech-enabled products may align better with policyholder needs; risk pricing could become more sophisticated and result in insurers managing their exposures better, and real-time availability of data should inform more timely decisions and facilitate oversight. Digital distribution should help make insurance more affordable and allow for more targeted products.
6. While the potential upside is great, there are some serious risks too, such as:
 - a. Risk pools may shrink, as advanced analytics may render some segments of the markets commercially uninsurable. This may lead to price discrimination and could particularly impact low-income/higher-risk customers.
 - b. Digitization in distribution of inclusive insurance may also increase the risk of misinformation, fraud or abuse.
 - c. These same advanced analytics may drive the further prevention and mitigation of risks, which will reduce the amount of risk that needs insuring and thus disrupt existing providers.
 - d. The plurality of data sources may pose privacy and hacking risks.

- e. Reliance on AI may reduce the transparency of some decisions, and may limit the depth to which even the executive management really grasps how the business operates, including the objective criteria on the basis of which risks/outcomes are assessed be it for underwriting or for providing incentives etc.
 - f. Increased reliance on outsourcing may introduce new single points of weaknesses for firms and the wider economy. For instance, if all actors in the market use a particular service (e.g., mobile network operators, cloud storage, or payment systems) this could lead to concentration risks, where a sudden failure or disorderly resolution entities could undermine consumer confidence. There is a risk to the consumer, but also a consideration for macro-prudential risk and financial stability.
 - g. Changing risk profiles may not be compatible with the design of current capital regimes.
 - h. Embedded insurance in services may be too opaque. Multiple jurisdictional oversight can create jurisdictional gaps or overlaps and regulatory arbitrage can happen.
7. Supervisors should expect that there will be more opportunities for mutual learning on this topic in the coming years as developments advance. InsurTech is becoming a regular focus of industry and regulatory events, with more training and knowledge-sharing opportunities than before.

III. Recommendations regarding regulatory approach towards InsurTech in India:

The remit of the Working Group is to make recommendations relating to regulatory and supervisory framework in respect of InsurTech, to the extent it relates to Risk Assessment, Risk Improvement, Product Design and Product Pricing. The Working Group has examined aspects relating to Market Conduct and Data related aspects such as data security, confidentiality and the overall risk management framework. Whilst on this the Working Group carried out a study of global best practices across the three insurance verticals—Life, General and Health.

Currently, IRDAI has already set out a framework for Distance Marketing, e-Commerce including Digital Platforms etc. Other IRDAI initiatives in the area of InsurTech include introduction of Insurance Repositories, setting out a framework for Web Aggregators and so on.

1. Risk Assessment and Risk Improvement

- i. Risk assessment and risk improvement aspects are operational matters, and indeed, the industry would do good to adopt any technology that facilitates risk assessment and improvement, as long as it is not against the interest of policyholders and the costs are not prohibitive, as it is the policyholder who has to bear the ultimate impact of such costs. Hence, a cost-benefit analysis before investing in such technology must be carried out keeping the long term objectives in view.

- ii. Insurers may be allowed to use technology that aids fraud detection at the point of underwriting and also for assessing the risk – for example, the use of wearables in the context of ‘diagnostics’ for better underwriting.

2. Product Design and Pricing

- i. Details of usage of wearable/portable devices should be part of the product filing
- ii. Regulations may need to consider the standards of the devices and their usage. Whilst doing this, the framework must bear in mind that technology changes very fast – so, only minimum standards should be laid down.
- iii. Supply of devices by the insurers should be prohibited.
- iv. Insurers could be allowed to provide incentives to customer based on their health and activity data captured by the device such as discounts on premium or an additional benefit clearly defined provided the specifics of such incentives are filed with the Regulator as part of the Product Filing Procedure.
- v. Product pricing and premium review could be based on the inputs received from the data captured through the devices.
- vi. Such products should first be tested in the sandbox environment and as pilot products as may be permitted. It would be of utmost importance to ensure that the interests of policyholders are not jeopardised in any manner as a result of transition from the sandbox environment.
- vii. The procedures and documentation set out in the relevant product filing framework for products involving use of portable/wearable devices shall be followed when it comes to the filing of products and the pricing aspects. The existing framework would need to be tweaked to address the filing of such products, bearing in mind the sandbox environment suggested in the form of pilot products.
- viii. A provision could also be made to enable insurance companies to add the wearable data pricing option in the existing products, should they find it viable. However, such a usage has to be with the consent of the insured and should not result in higher premiums or terms and conditions than is allowed currently. But, if customers show improvement, lowering of premium may be considered.
- ix. The outsourcing of monitoring and analysis of such data would be subject to the regulations on outsourcing set out by the IRDAI from time to time.

3. Data Related Aspects

- i. The consent of the customer to share his data is a must for participation in such products. The consent should be for specific data and the specific purpose for which it is being obtained should be obtained. These should be clearly explained to the customer before the consent is obtained.
- ii. Where, during the term of a product a customer withdraws his consent, any discount offered for usage of such devices and its output shall be withdrawn.
- iii. Insurers may be allowed to capture data as per their product requirements, but within the scope of insurance and underwriting need. Insurers should be required to mention all data elements that they are planning to capture as part of their product filing process. However, in order to ensure standardisation of data capture across insurers for creation of a repository of generic data that may benefit the industry as a whole, the basic standard data elements could be worked upon by the General Insurance Council and the Life Insurance Council (for general insurance and life insurance respectively), and recommendations sent to IRDAI in order that such standard data elements may be prescribed by the Regulator.
- iv. It would be necessary to ensure that portability of customer's data happens in the event there is a situation of him/her moving from one insurer to another (in the case of short term products such as in non-life insurance/health insurance). An agency such as the Insurance Information Bureau of India could create the required mechanism that would also create a repository for capture of industry level data.
- v. In all instances, the security and confidentiality of customer data shall be protected at all costs. Industry level data would only consist of masked data that enables generation of generic queries and reports.

LIST OF REFERENCES

Sl.No.	Details
01	Pwc.com/InsurTech-Opportunities await: How InsurTech is reshaping insurance
02	IAIS-FinTech Developments in the Insurance Industry dated:21st February 2017
03	Britt Armour_02nd November 2017- How FinTech is Transforming The Insurance Industry
04	EY-Insurer of the future_August 2016
05	https://www.fca.org.uk/firms/fca-innovate -UK,Australia and Singapore take the lead
06	IAIS-aii-Report of the 24th A2ii-IAIS Consultation Cell-Supervising InsurTech
07	aii-short briefing note-14th February 2017-Regulating Mobile Insurance: Status and Regulatory Challenges
08	aii-IAIS-Report of the 19th A2ii-IAIS Consultation Cell-Data protection challenges in mobile insurance
09	Pwc.com/Global Fintech Report 2017- Redrawing the lines: FinTech's growing influence on Financial Services
10	Fintech Regulatory Sandbox Guidelines (Nov 2016) of Monetary Authority of Singapore

ANNEXURES

Annexure A: Order constituting the Working Group

Ref. No: IRDA/NL/ORD/MISC/264/12/2017 Date: 07-12-2017

Constitution of a Working Group to examine 'Innovations in insurance involving wearable / portable devices'

Use of wearable and/or portable devices in insurance is a subject that frequently comes up in the context of Financial Technology (FinTech). IRDAI's Health Insurance Regulations recognise the role of 'Wellness' in risk assessment and product design. In the context of both Health Insurance and Life Insurance, wearable devices could be used to measure personal fitness, incorporate a healthy lifestyle etc. When it comes to Motor Insurance, recently the IRDAI had put up a Discussion Paper on the subject of 'Telematics' in Motor Insurance. Indeed, it is important to understand technology trends and their various implications for insurance even while seeking to harness the potential and advantages they seem to offer. While encouraging innovation, the regulator must run alongside it, keeping in view the interests of policyholders. It is from this perspective that IRDAI has decided to set up the instant Working Group (WG). It is constituted as follows:

1. Ms.YegnapriyaBharath, CGM, IRDAI, Chair
2. Mr.V.Jayanth Kumar, CGM, IRDAI, Member
3. Mr.S.P.Chakraborty, GM, IRDAI, Member
4. Mr. DVS Ramesh, GM, IRDAI, Member
5. Mr.Dinesh Pant, AA, Life Insurance Corporation of India
6. Ms.GouriRajan, DGM, The New India Assurance Company Ltd
7. Mr.TapanSinghel, CEO, Bajaj Allianz General Insurance Company Ltd
8. Mr.AshishMehrotra, CEO, Max Bupa Health Insurance Co Ltd
9. Mr.VV.Balaji, Chief of Technology and Operations, ICICI Pru Life Insurance Co Ltd
10. Ms.AnitaJosyula, GM, IRDAI (Convenor)

The Terms of Reference of the WG would be to:

- a). Examine how technological advancements, particularly wearable and portable devices may be treated from the point of view of risk improvement, risk assessment and use/distribution of such devices as part of policy design.
- b). Understand the practices of other jurisdictions in this area
- c). Suggest the policy framework that needs to be put in place keeping in view the interests of policyholders.
- d). Examine the various aspects that would impact the pricing
- e). Comment on/ make suggestions regarding any other matter that is relevant or connected to this area

The Working Group may hold meetings as and when necessary and shall submit its report containing recommendations within 8 weeks of the date of this order.

(P.J. Joseph)
Member(Non-Life)

ANNEXURE B: DISCUSSION PAPER ON TELEMATICS

Ref. No: IRDAI/NL/PNTC/MISC/179/08/2017 Date: 03-08-2017

DISCUSSION PAPER

Telematics and Motor Insurance

I. Introduction:

The world of technology is dynamic. Technology constantly makes waves in every field and the insurance industry too has benefitted immensely from the advantages technology offers. In this paper, we restrict ourselves to the concept of 'Telematics' and the role it can play in Motor Insurance. The purpose of this paper is to understand what Telematics is all about and discuss the advantages and challenges of adopting Telematics in Motor insurance. The idea is to discuss and mull over questions relating to various aspects including customer information/data privacy, whether there is a necessity to revisit the framework around the product structure of motor insurance, the role Telematics can play in the pricing of motor insurance products etc.

At present, Motor Insurance in India is being priced based on parameters like the Make and Model of the Vehicle, its capacity, the geographical use etc. There can be several other aspects to the use of a vehicle. For instance, customers who use their vehicles for lesser duration or lesser distances are prone to lesser risks and those who use their vehicles for longer durations and more distances are prone to more risks but both sets of customers today pay the same premium for a particular vehicle. In actuality, there are various parameters to be considered in the assessment of risks that a vehicle is exposed to such as upkeep of the vehicle, how frequently it is driven, what distance it is driven for, the quality of roads it is driven on, the driving habits of the driver and so on. Consideration of these factors will lead to a more meaningful risk assessment and provide for a more accurate mechanism for pricing.

There are a variety of driving habits of customers and usage of vehicles also varies widely because of many factors like new forms of transport, demographic shifts, whether one is driving one's own car or somebody else's etc. Also, due to increasing use of other modes of transport like Suburban trains, Metros, employer provided transport, private rented cars/taxis etc, some people may not be using their own vehicles frequently. Where usage is less, the vehicles would be prone to lesser risks.

On the contrary, public transport, rental vehicles etc are prone to more risks as they are on the roads for a longer duration. Today, premiums are being charged based on available information related to limited parameters only. If accurate information and more relevant data are available, premium can be worked out more scientifically, commensurate with the risks involved.

2. Telematics as a solution:

'Telematics' can offer a solution to the above aspects. It can enable insurance companies to use technology not only to assess risks better and also offer more efficient claims services. There are technologies, enabled through internet connectivity, that offer solutions ranging from embedded vehicle telematics systems to smart phone applications that can challenge traditional business models and create new opportunities setting one rethinking on how insurance companies can carry on business. It has been seen that these new technologies can provide a wealth of opportunities for insurers to offer new, value-added services to policyholders.

3. What is Telematics and what is Telematics Insurance?

'Telematics' is a word coined from the combination of the words 'telecommunications' and 'informatics'. Usage of Telematics in insurance is known as 'Telematics Insurance'. Telematics Insurance is known by several other names—Black Box Insurance, GPS Car Insurance, Smart Box Insurance, Pay-as-you-Drive-Insurance, Usage Based Insurance (UBI) and so on. As can be seen, generally when it comes to insurance, Telematics has application in the Motor segment. It refers to the integrated use of telecommunications and information technology for vehicles. It is widely used for providing services such as real-time navigation, roadside assistance, vehicle tracking etc. Insurance telematics refers to use of telematics by motor insurers with an objective of having better segmentation of customers and having a pricing methodology that reflects the actual risk a customer exposes his or her vehicle to.

4. How Telematics Insurance works?

Telematics Insurance works by fitting a vehicle with a small device—commonly known as a 'black box' that records speed patterns and distance travelled as well as data about the type of road/s the driver is driving on and when (whether night or day or during the weekend etc.) and how long he has been driving. The technology can also monitor braking and cornering to build up a picture of the driver's driving style. Generally, Telematics devices operate with accurate and reliable GPS technology and can capture data like – maximum/average speed travelled, acceleration, braking, cornering, latitude/longitude, elevation, distance travelled, number of journeys, journey time, road type, G-force (impact detection), idle time, number of other cars on the road, weather circumstances etc. Data can also be collected through use of smart phone and on-board diagnostic port.

5. Brief history and global trends of Telematics Insurance:

In UK and USA, implementation of Telematics commercially began back in the early 2000s. However, the introduction of smart phone technology combined with an easier and cheaper installation process has enabled as re-launch of Telematics Insurance in 2010 keeping in mind a particular target segment—the young drivers. At present, even in these countries, Telematics Insurance is a niche market with a few specialised insurers and a few traditional insurance companies too plunging into it.

In Italy, insurers initially used the technology for tracking stolen vehicles but now are increasingly using it to monitor and provide feedback on driver behaviour. It is understood that Italy is a large market for Telematics in Europe. South Africa too has Telematics Insurance.

6. Role of Telematics in risk profiling and pricing:

The Black Box records and transmits a broad set of information to the insurance company. Insurers use this data to calculate the cost of insurance and adjust premium accordingly, with each aspect having an effect on the price that a customer should pay. As discussed above, this data includes distance travelled, speed of the drive, braking and accelerating habits, the date and time when the vehicle was driven, the number of stops during a long journey, the number of miles driven per journey, the mix of journeys (in town, out of town, motorway etc.) as well as the number of journeys etc. How the insurer prices is that normally, an up-front fee is charged, which includes the cost of the device and its installation, and then quote an annual premium which can decrease or increase, depending upon driving performance and other factors given above. In addition, the monitoring system is constantly in place during the policy-term. The policy term, driver skills and other factors are monitored constantly and the premium is readjusted/recalculated periodically.

7. Advantages of Telematics:

(a). To Customers:

1. A careful driver who doesn't cover many miles and drives predominantly during off-peak hours could see a reduction in the premium.
2. A customer will find the premium to be directly proportional to the performance and usage of his/her vehicles/s bringing in transparency and fairness.
3. If one has a black box, it can act as a tracking device—if the vehicle is lost or stolen, it can be found sooner (by the police). The black box system, called e-call, helps emergency services locate vehicles in the event of a crash or other emergency repairs.
4. Telematics also facilitates fleets to determine the most efficient routes, saving them costs related to personnel, fuel and maintenance.
5. In a driver driven car, the concerns of the owner of the car, like how the car is being driven, where the car is being taken, whether the driver is picking up the family members (especially children or the girl child), whether the driver is following the usual route or going out of the area/boundary—all these concerns will be addressed by Telematics by forming of a geo fencing. The location of the vehicle is continuously tracked. If the driver travels beyond a defined boundary, the vehicle displays an alert on the car's dashboard screen and the designated contact receives an alert on a mobile device through a smart phone app.
6. Due to connectivity and increased monitoring of the vehicle, there will be increase in the security and longevity of the vehicle. Other services like speed alerts, engine and battery health alert, breakdown call, crash alert, emergency calls, other service alerts and notifications etc. can also be availed.
7. The insurer can use cloud capabilities to notify drivers of available garages, based on the driver's destination. It can warn policyholders when they enter into areas where auto thefts are more common or accident occurrences are high.

(b). To Insurers:

1. It will help insurers in better segmentation of customers by assessing the risk accurately.
2. Telematics helps insurers estimate more accurately, accident damages and reduce fraud by enabling analysis of driving data (such as hard braking, speed and time) during an accident.
3. The data received and compiled can provide insurers with Next Gen analytical insights through predictive analysis.
4. It can help improve profitability of insurer because of better risk segmentation and deliver higher levels of customer insight improving relationship management and increasing retention rates.
5. During accidents, Telematics can automatically send data to an insurance company immediately after the incident, providing the first notice of loss. By rapidly analyzing data from sensors on brakes, air bags, seat belts and other systems, the insurer can estimate the severity of the accident. The insurer can then initiate a series of appropriate actions, such as calling emergency personnel, contacting an automobile club or towing service, reserving and delivering a rental car to the scene or sending a replacement fleet vehicle in the case of a commercial operation, if the product permits it.
6. The collected data can also help the claims handling process and help reduce loss adjustment expenses.

(c). To Society:

1. Telematics makes drivers more aware of driving techniques and ultimately contributes to providing better drivers.
2. Thus it encourages safer and more considerate driving which will ultimately lead to safer roads for all citizens and reduce traffic congestion and pollution.
7. Challenges posed by Telematics:

The use of Telematics has its own challenges as well:

1. The device would need to be fitted in the vehicle by a professional installer.
2. A driver who is good may still have to pay more premium if he clocks up many miles of driving.
3. When an insured switch from one company to another, there could be issues relating to portability of data—the newer company may refuse to take cognizance of previous data.
4. There could also be issues surrounding privacy of data and what data can be shared and what cannot.
5. Implementing Telematics would involve cost. The cost would need to be integrated into the pricing structure.

8. Alternatives to Telematics:

There are alternatives to Telematics also coming up. Smart phones with certain mobile apps can actually replace a Telematics device. There is another alternative in the form of a 'Dongle' on the On Board Diagnostic (OBD) or car socket, which is an intermediate solution—between the Black Box and a mobile app. There is a sensor which connects automatically with the smart phone with the App installed via Bluetooth, eliminating both the black box cost and the need for a separate SIM card. OBD devices are easy for the customer to fit and they can synchronize well with the mobile app and the central server—here the car owner can see the vehicle and driving diagnostics data on his/her mobile screen.

9. Questions/Points to mull:

- (i). Cost involved in implementing Telematics and its impact on the pricing of the product—need to revisit the pricing methodology.
- (ii). Collection and collation of data at individual (insured) level and matters relating to privacy, transfer of data, portability matters involving carry forward of credit for good driving habits etc.
- (iii). Need to revisit product structures currently existing, including the duration of products etc.
- (iv). Current regulatory framework around products and protection of policyholders interests and the need to revisit them.
- (V). Use of alternative devices (to Telematics)

References:

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4. IBM—White paper on Telematics for Insurance
5. PPT on Automotive Telematics and Multimedia in the US by Global Policy Group
6. Website of WIPRO
7. Website of Geo-Spatial World Forum

