中国保险科技发展白皮书

China InsurTech Development White Paper

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指导单位：中国保险学会
Project Adviser: the Insurance Society of China

编写单位：复旦大学中国保险科技实验室
Produced by: China InsurTech Lab, Fudan University

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序一

人工智能、无人驾驶技术等新兴科技被视为人类继蒸汽机时代、电器时代和信息时代之后的第四次工业革命。中国也是目前本次工业革命的重要试验场。科技的发展极大地改进了保险生态环境，改良保险行业痛点，改变保险的传统使命。科技改变保险，保险改变生活。

中国保险学会联合复旦大学共同发布的《中国保险科技发展白皮书（2017）》是迄今为止国内唯一系统地梳理了未来影响中国保险行业发展的十大重要科技的研究报告，报告用学术性、国际化、前瞻性的视角，将区块链保险、人工智能、云计算等最新科技发展与保险行业的结合囊括在保险科技（InsurTech）的框架下进行讨论，也使得InsurTech成为有别于其他FinTech的重要领域与研究命题。

科技强国是中国梦的重要载体。无论是《国务院积极推进“互联网+”行动的指导意见》还是《中国制造2025》等行动纲领，都是推动科技进步与社会发展的重要手段。保险行业作为经济社会发展保驾护航的重要行业，理应在与科技结合和运用上发挥积极的作用。《中国保险科技发展报告（2017）》展现给保险行业新兴科技的发展与力量，也提供给科技公司和相关主体保险行业期待利用科技手段改良生态的痛点与运用，更梳理了近年来中国相关保险科技的实验与创新。本白皮书的发布，将有助于更好地凝聚行业共识、汇聚科技力量、崇聚保险创新。

中国保险监督管理委员会原副主席　周延礼

2017年5月28日

序二

随着大数据、云计算、区块链、人工智能、移动互联等新一代信息技术的发展和应用，金融科技（FinTech）风起云涌，不仅提升了金融工作效率，优化了金融服务体验，而且改变了人们生活。

作为金融业中的重要领域，保险业发展与信息技术变革正在发生共振，将保险业带入一个更广阔的全新发展领域。近年来，保险科技（InsurTech）从金融科技的讨论范畴脱颖而出，成为保险业界、科技界、学术界、资本市场和监管者共同关注的重要话题，许多国家相继成立专门机构或者创新特区，并且给予保险科技税收优惠或者资金支持等政策扶持，我国保险科技发展也在异军突起。

唯有敬畏科技，我们才能抢占保险科技的全球制高点；唯有尊重规律，我们才能推动保险业又好又快发展。在中国保险监督管理委员会的指导下，中国保险学会密切跟踪全球保险科技发展态势，联合复旦大学开展中国保险科技专门研究，旨在把握全球保险科技的趋势和方向，分析保险科技新特点新模式，剖析我国保险科技发展的现状及其存在的问题，并提出有针对性的政策建议，使我国保险科技发展既能又好又快，又能行稳致远，开创我国保险业发展的新未来，更好地服务全面小康社会建设。

本报告重点讨论了10项科技与保险行业的结合。这10项科技包括区块链技术、人工智能、物联网、云计算、大数据、车联网、无人驾驶汽车、无人机、基因检测、可穿戴设备，每项技术均阐明技术原理，分析保险行业相关痛点和运用相关科技的解决思路，并且讨论运用场景以及技术结

合过程的机遇、挑战。本结构安排是为了服务多样化的保险生态主体：现有的保险业者可以更好地了解技术原理；希望进入保险行业的科技公司或者其他行业可以了解保险行业发展的痛点和与科技结合改良业态的潜在机会。

本报告梳理了目前保险科技发展的4种创新渠道、16个细分领域的创新，包括产品创新、保险营销、企业运营、信息咨询等多个方面，对全球1302个保险科技企业进行分类，借鉴和介绍了128家机构保险科技的创新案例。

本报告是集体智慧的结晶。报告研究成员既有中国保险学会、巴黎欧盟金融监管研究院、中国保监会上海监管局、上海市保险学会等保险研究机构和保险监管部门的智囊，也有复旦大学、牛津大学、圣地亚哥加州大学等国内外高等院校的学者，还有众安保险、中国再保险等保险公司的专家。团队的成员都是利用个人的业余时间进行研究，所呈现的观点是他们个人的智慧和团队集体的结晶。当然，由于保险科技还在发展的早期，参考文献少，业态发展快，有些内容仅是一家之言，还有诸多需要完善的地方。我们期待越来越多的机构和个人加入到保险科技的研究中，共同推动保险科技的学术研究，推进创新业态的积极发展。

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2017年5月28日

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目录

序一 …… I

序二 …… II

表目录 …… XIII

图目录 …… XIV

保险科技术语与缩略语 …… XX

内容摘要 …… XXIII

Executive Summary …… XXXV

一、概述 …… 1

(一)保险科技发展背景 …… 1

1. 保险科技(Insurtech)与金融科技(Fintech) …… 1

2. 保险科技在金融科技中的地位 …… 1

(二)保险科技(Insurtech)的内涵 …… 1

1. 保险科技(Insurtech)定义 …… 1

2. 保险科技的几个重要认知 …… 2

二、中国保险科技发展生态 …… 4

(一)保险市场发展潜力 …… 4

1. 发展趋势 …… 4

2. 发展潜力 …… 4

(二)保险行业价值构成 …… 5

1. 理解保险行业价值的意义 …… 5

2. 中国保险市场产品结构 …… 5

3. 中国保险市场价值链分配 …… 6

(三)保险科技生态主体 …… 8

1. 传统保险公司 …… 8
2. 保险中介机构 …… 9
3. 保险消费者 …… 10
4. 初创科技企业 …… 10
5. 其他行业巨头 …… 11
6. 金融投资机构 …… 12
7. 保险监管机构 …… 12

三、保险科技与运用 …… 14
(一)区块链技术 …… 14
1. 技术原理 …… 14
2. 行业痛点 …… 15
3. 解决思路 …… 16
4. 运用场景 …… 17
5. 机遇挑战 …… 18
(二)人工智能 …… 19
1. 技术原理 …… 19
2. 行业痛点 …… 20
3. 解决思路 …… 21
4. 运用场景 …… 22
5. 机遇挑战 …… 24
(三)物联网 …… 24
1. 技术原理 …… 24
2. 行业痛点 …… 25
3. 解决思路 …… 26

4. 运用场景 …… 27
5. 机遇挑战 …… 28
(四)云计算 …… 29
1. 技术原理 …… 29
2. 行业痛点 …… 30
3. 解决思路 …… 31
4. 运用场景 …… 32
5. 机遇挑战 …… 33
(五)大数据 …… 34
1. 技术原理 …… 34
2. 行业痛点 …… 35
3. 解决思路 …… 35
4. 运用场景 …… 36
5. 机遇挑战 …… 37
(六)车联网 …… 37
1. 技术原理 …… 37
2. 行业痛点 …… 39
3. 解决思路 …… 39
4. 运用场景 …… 40
5. 机遇挑战 …… 41
(七)无人驾驶汽车 …… 42
1. 技术原理 …… 42
2. 行业痛点 …… 43
3. 解决思路 …… 44
4. 运用场景 …… 45

5. 机遇挑战 …… 45
(八)无人机 …… 46
1. 技术原理 …… 46
2. 行业痛点 …… 48
3. 解决思路 …… 49
4. 运用场景 …… 49
5. 机遇挑战 …… 50
(九)基因检测 …… 51
1. 技术原理 …… 51
2. 行业痛点 …… 52
3. 解决思路 …… 53
4. 运用场景 …… 53
5. 机遇挑战 …… 54
(十)可穿戴设备 …… 55
1. 技术原理 …… 55
2. 行业痛点 …… 56
3. 解决思路 …… 56
4. 运用场景 …… 56
5. 机遇挑战 …… 57

四、保险科技市场发展 …… 59
(一)创新渠道 …… 59
(二)产品创新 …… 59
1. 细分领域 …… 59
2. 相关案例 …… 60

(三)保险营销 …… 62
1. 细分领域 …… 62
2. 相关案例 …… 63
(四)企业运营 …… 65
1. 细分领域 …… 65
2. 相关案例 …… 65
(五)信息资讯 …… 67
1. 细分领域 …… 67
2. 案例分析 …… 67
(六)市场发展 …… 68
1. 各国保险科技发展 …… 68
2. 保险科技初创企业 …… 69

五、国际保险科技监管 …… 72
(一)中国 …… 72
(二)中国香港 …… 72
(三)新加坡 …… 73
(四)英国 …… 74
(五)美国 …… 75
(六)德国 …… 77

六、中国保险科技发展建议 …… 79

附录 调研企业名单 …… 82

表目录

表 1 区块链技术特征与保险创新嵌合 …… 16
表 2 保险行业痛点与区块链运用 …… 17
表 3 自动驾驶等级与标准 …… 42
表 4 无人机基本结构与技术 …… 47
表 5 无人机技术主流结构与发展趋势 …… 47
表 6 无人机分类及应用 …… 48
表 7 无人机自身的技术挑战 …… 50
表 8 部分市场销售的基因保险 …… 54
表 9 产品创新细分领域及相关业态 …… 59
表 10 保险销售细分领域及相关业态 …… 63
表 11 企业运营细分领域及相关业态 …… 65
表 12 企业运营细分领域及相关业态 …… 67
表 13 保险科技初创企业创业领域与融资情况 …… 70

图目录

图 1 保险科技结构图 …… 2
图 2 中国 2006-2015 年寿险产品市场格 …… 6
图 3 中国 2006-2015 年财产保险产品格局 …… 6
图 4 中国大陆部分寿险公司业务价值分配情况 …… 7
图 5 中国大陆财险公司业务价值分配情况 …… 8
图 6 云计算体系构架 …… 29
图 7 车险信息共享平台体系架构 …… 33
图 8 车联网定义中的三个层次结构 …… 38
图 9 保险科技初创企业平均寿命与融资规模 …… 71

Contents

Introduction I ····· I

Introduction II ····· II

Table Directory ····· XIII

Figure Directory ····· XIV

Insurtech terms and abbreviations ····· XX

Abstract ····· XXIII

Executive Summary ····· XXXV

1.Overview ····· 1

1.1 The background of InsurTech development ····· 1

1.1.1 InsurTech and FinTech ····· 1

1.1.2 The role of InsurTech in FinTech ····· 1

1.2 The connotation of InsurTech ····· 1

1.2.1 The defination of InsurTech ····· 1

1.2.2 Key factors of InsurTech ····· 2

2.The eco-system (environment and development) of InsurTech in China ····· 4

2.1 The potential of inurance market ····· 4

2.1.1 The trend of development ····· 4

2.1.2 The potential of development ····· 4

2.2 The value composition/component of insurance market ····· 5

2.2.1 Understanding the value composition of insurance sector ····· 5

2.2.2 The structure of insurance products in China ····· 5

2.2.3 The distribution of value chain of insurance in China ····· 6

2.3 The eco-system of InsurTech ····· 8

2.3.1 Traditional insurers ····· 8
2.3.2 Insurance intermediaries ····· 9
2.3.3 Consumers ····· 10
2.3.4 InsurTech startups ····· 10
2.3.5 Dominat firms in other industry ····· 11
2.3.6 Financial institutions ····· 12
2.3.7 Insurance regulatory authorities ····· 12

3.The applications (applied technologies) in InsurTech ····· 14
3.1 Bloch chain technology ····· 14
3.1.1 Technical principle ····· 14
3.1.2 Pain points of insurance market ····· 15
3.1.3 Solutions ····· 16
3.1.4 Applications ····· 17
3.1.5 Opportunities and challenges ····· 18
3.2 Artificial intelligence ····· 19
3.2.1 Technical principle ····· 19
3.2.2 Pain points of insurance market ····· 20
3.2.3 Solutions ····· 21
3.2.4 Applications ····· 22
3.2.5. Opportunities and challenges ····· 24
3.3 Internet of things (IoT) ····· 24
3.3.1 Technical principle ····· 24
3.3.2 Pain points of insurance market ····· 25
3.3.3 Solutions ····· 26

3.3.4 Applications ····· 27
3.3.5 Opportunities and challenges ····· 28
3.4 Cloud computing ····· 29
3.4.1 Technical principle ····· 29
3.4.2 Pain points of insurance market ····· 30
3.4.3 Solutions ····· 31
3.4.4 Applications ····· 32
3.4.5 Opportunities and challenges ····· 33
3.5 Big data ····· 34
3.5.1 Technical principle ····· 34
3.5.2 Pain points of insurance market ····· 35
3.5.3 Solutions ····· 35
3.5.4 Applications ····· 36
3.5.5 Opportunities and challenges ····· 37
3.6 Telematics ····· 37
3.6.1 Technical principle ····· 37
3.6.2 Pain points of insurance market ····· 39
3.6.3 Solutions ····· 39
3.6.4 Applications ····· 40
3.6.5 Opportunities and challenges ····· 41
3.7 Driverless car (autonomous vehicle) ····· 42
3.7.1 Technical principle ····· 42
3.7.2 Pain points of insurance market ····· 43
3.7.3 Solutions ····· 44
3.7.4 Applications ····· 45

3.7.5 Opportunities and challenges ····· 45
3.8 UAV (Unmanned Aerial Vehicle) ····· 46
3.8.1 Technical principle ····· 46
3.8.2 Pain points of insurance market ····· 48
3.8.3 Solutions ····· 49
3.8.4 Applications ····· 49
3.8.5 Opportunities and challenges ····· 50
3.9 DNA genetic testing ····· 51
3.9.1 Technical principle ····· 51
3.9.2 Pain points of insurance market ····· 52
3.9.3 Solutions ····· 53
3.9.4 Applications ····· 53
3.9.5 Opportunities and challenges ····· 54
3.10 Wearable device ····· 55
3.10.1 Technical principle ····· 55
3.10.2 Pain points of insurance market ····· 56
3.10.3 Solutions ····· 56
3.10.4 Applications ····· 56
3.10.5 Opportunities and challenges ····· 57

4. The market development of InsurTech ····· 59
4.1 The innovation channel ····· 59
4.2 The innovation of product ····· 59
4.2.1 Subdivision fields ····· 59
4.2.2 Related cases ····· 60

4.3 The marketing of insurance ····· 62
4.3.1 Subdivision fields ····· 62
4.3.2 Related cases ····· 63
4.4 The operation of company ····· 65
4.4.1 Subdivision fields ····· 65
4.4.2 Related cases ····· 65
4.5 The information and intelligence ····· 67
4.5.1 Subdivision fields ····· 67
4.5.2 Case study ····· 67
4.6 The market development ····· 68
4.6.1 The development of InsurTech worldwide ····· 68
4.6.2 The InsurTech startups ····· 69

5.The global supervision of InsurTech ····· 72
5.1 China ····· 72
5.2 Hong Kong ····· 72
5.3 Singapore ····· 73
5.4 UK ····· 74
5.5 US ····· 75
5.5 Germany ····· 77

6. The suggestion for the development of InsurTech in China ····· 79

Appendix: The list of investigated enterprise ····· 82

保险科技术语与缩略语

保险科技		InsurTech
按使用计价保险	UBI	Usage-based Insurance
比特币		BitCoin
泊车辅助	PA	Parking Assistance
操作设计领域	ODD	Operational Design Domain
车道保持	LKS	Lane Keep Support
车联网	IOV	Internet of Vehicles
车辆偏离预警	LDW	Lane Departure Warning
车载诊断系统	OBD	On-board Diagnostics
大数据		Big data
电子驾驶员		E-driver
分布式账本技术	DLT	Distributed ledger Technology
高度自动化的车辆	HAV	Highly Automated Vehicles
高级辅助驾驶系统	ADAS	Advanced Driver Assistant System
共享经济		Sharing Economy
谷歌应用引擎	GAE	Google App Engine
光学字符识别	OCR	Optical Character Recognition
后车市场		Auto Aftermarket
互联网+		Internet Plus
机器对机器	M2M	Machine to Machine
基础设施层服务	IaaS	Infrastructure as a Service
价值链		Value Chain
驾驶里程付费保险	PAYD Insurance	Pay as You Drive Insurance
监管沙盒		Regulatory Sandbox
金融科技		Fintech
尽职调查		Due Diligence
可穿戴设备		Wearable Devices
客户关系管理系统	CRM	Customer Relationship Management
括射频识别装置	RFID	Radio Frequency Identification
摩尔定律		Moore Law
欧盟复兴计划	ERP	European Recovery Programme

平台层服务	PaaS	Platform as a Service
前向行人避让刹车	FPIMB	Pedestrian Impact Mitigation Braking
前向碰撞减免/避免	FCAM	Forward Collision Avoiding and Mitigation
前向碰撞预警	FCW	Forward Collision Warning
情景化营销		Scene Marketing
区块链		Block Chain
全球定位系统	GPS	Global Positioning System
人工智能	AI	Artificial Intelligence
人类驾驶员		Human Driver
软件层服务	SaaS	Software as a Service
深度学习	DL	Deep Learning
神经网络		Neural Net
世界经济论坛	WEF	World Economic Forum
微软 Azure 云服务		Microsoft Azure
无人驾驶航空器	UAV	Unmanned Aerial Vehicle
物联网	IOT	Internet of Things
线上到线下	O2O	Online to Offline
亚马逊云	AWS	Amazon Web Service
夜视技术	NV	Night Vision
云计算		Cloud Computing
智能合约		Smart Contract
智能家居		Smart Home
智能投顾		Robot Advisor
专家系统	ES	Expert System
自动紧急刹车	AEB	Autonomous Emergency Braking
自适应巡航	ACC	Adaptive Cruise Control
P2P 保险		P2P Insurance
Peak Re 的寿险核保方案指南	PULSE	Peak Re Underwriting Life Solutions Expert

内容摘要

一、概述

（一）保险科技发展背景

保险科技的发展与金融科技息息相关，保险科技曾牢牢根植于金融科技的土壤，现有的保险科技发展的方式得益于几个事实。首先，随着保险业的发展壮大，市场投向保险科技的目光较之过去有了极大的增长；其次，金融危机的蔓延使得大金融机构不得不回归主业，初创企业、科技公司逐渐成为金融科技和保险科技的主导者；最后，世界经济论坛的报告指出，面对科技的高速发展和替代，在大金融体系下，保险业将承受最大的冲击。这使得保险科技在保险公司、科技企业和初创企业的发展规划和布局战略中占有极为重要的位置。

（二）保险科技的内涵

保险科技首先是科技，其次才是保险。它以包括区块链、人工智能、大数据、云计算、物联网等在内的科技为核心，围绕保险的方方面面进行表现，广泛运用于产品创新、保险营销和保险公司内部管理等方面，通过创建新的平台、运用新的技术服务保险消费者。

由于保险科技“科技为核”的理念，其概念远不止于科技保险这个单一的、为科技承保的产品，而是对现有保险产业的改良、提升和扩展。科技的发展使得保险能够更细微地渗透进普通人的每一个行为中，也使得保险公司和保险市场能够逃离无序竞争、同质竞争的环境，实现保险生态的整体跃迁。

消费者的需求催生了保险科技，保险科技也将改变消费者的行为，使消费者更好地认识风险、理解风险、重视风险、管理风险，从而达到降低风险、提高生活品质的目的，并进一步促进保险市场服务质量和服务内涵的提升。

二、中国保险科技发展生态

（一）保险市场发展潜力

中国经济的快速发展给保险业的飞速发展提供了有力的支撑。2016年保险业总资产规模超

15万亿元，近十年复合增长速度达到24%，保费收入处在稳定的快速增长期，传统的寿险、产险，新兴的健康险、意外险等险种的原保费收入同期增速均高于我国GDP的增长速度。

毫无疑问，中国不仅仅已经成为世界GDP大国，也成为了保险大国，保险市场规模仅次于美国和日本，保费收入名列全球前茅。但保险大国并不意味着保险强国，中国保险市场仍然存在着保险密度和保险深度不高、渗透率低、行业影响力不足等问题，和银行业、证券业相比，同为大金融体系三大支柱之一的保险业总资产占比极低。这种占比的缺失既是行业发展的不足，也是行业未来发展潜力和发展空间巨大的有力证明。

（二）保险行业价值构成

理解保险行业的价值构成，有利于进一步理解保险科技可能对保险业造成的结构冲击，并进一步了解保险科技在保险市场上的可发力点。

从寿险市场来看，两全保险和年金保险依然在市场上占据了主导地位，但健康保险和意外险的热度也逐渐提升。从非寿险市场来看，机动车辆保险稳定地占据了73%的市场，财产险、责任险、农业保险等险种也有一定的市场空间，且波动较小。

保单主体、销售渠道方、保险公司股东、国家机构等都是保险行业价值链上的一环，围绕着原保费收入、股东权益和资产增值的价值基础进行分配，具体体现为赔付成本、销售成本、运营成本、分配利润和税收等。从寿险公司的角度解读，准备金部分区别不大，而其他部分视公司战略和规划的不同，具有较大的差异。从非寿险公司角度进行解读，运营成本和渠道成本差异不大，其他部分则和公司的理赔政策及产品结构息息相关。这些结构性差异或许可以成为保险科技的主要着力点。

（三）保险科技生态主体

保险科技生态圈主要包括传统保险公司、保险中介机构、保险消费者、初创科技企业、其他行业巨头、金融投资机构和保险监管机构七个主体。不同的主体既有其主攻区域，也互有交叉和涉猎。

传统保险公司是生态圈中的重要组成部分，不仅是市场上主要的产品和服务提供者，也是目前参与保险科技的重要力量。传统保险公司目前通过开发应用、成立部门、投资企业、寻求合作、

成立公司等多种手段参与了保险科技的布局。保险中介机构受保险科技影响较大，为寻求在保险领域内的优势，已开始进行了改革，主要通过加强线上线下服务联动的方式，强化保险中介的重要性，增强客户的黏着度。保险消费者位于生态圈的需求端，供给端的改革和科技的发展将给予消费者更多物美价廉、公开透明的选择，也悄然地改变着消费者的消费行为，使认知风险、紧密沟通、有效交互、主动消费成为保险消费的“新常态”。初创科技企业不是原保险生态圈的主体，但却是保险科技生态圈不可或缺的部分。初创企业拓展了保险服务的外延，在寿险、财险、健康险等方面都扮演着“以技术促服务”的角色，通过改变信息采集、分析和使用方式，使服务更准确、更安全、更高效、更直观，如无人机信息搜集、可穿戴设备和医疗服务的结合等。其他行业巨头主要包括了和保险产品相关的上下游企业，是保险科技的主要呈现者，如汽车厂商和车联网技术的结合，互联网企业、医疗机构和保险行业的合作等。金融投资机构是保险科技生态圈的推动者，既是保险科技的风向标，表明了领域内能够引起资本注意的热点，也是保险科技企业起步的助推器，能够通过充沛的资金、优秀的管理经验帮助保险科技快速起航，步入正轨。保险监管机构是保险科技生态链条的守夜人，同时承担着鼓励、引导和监管的职责，在很大程度上决定了保险科技的健康发展状况。

三、保险科技与运用

（一）区块链技术

区块链技术通过建立电子信息、加密、确认交易、实时广播、添加区块和网络复制记录等六个步骤完成工作，通过这些步骤，区块链传递和储存的信息具有了去中心化、开放性、透明性、匿名性、数据不可篡改性和自治性六大特征，这些特征使得过去信息安全性低、信息连续性差、信息采集成本高、推广渠道限制多、信息不对称问题突出等状况有了一个可靠的解决途径。去中心化的特质使得保险对中介的依赖度下降，有助于费用的降低和相互保险的发展；开放性减少了供给端和需求端的信息不对称问题，有利于过去难定价、难分析的产品的发展；透明性、匿名性和数据不可篡改性使得保险信息的获取更便捷、快速、准确、连续，提供了安全性，解决了投保人的隐私问题；而自治性撇除了人为干扰，在降低人力成本的同时减少了合同实施可能产生的纠纷。

目前而言，区块链的运用主要有以下几个方向。运用区块链技术，可以快速进行身份和信息的校验；能够实现数据和企业的分离，使授权第三方能够就数据进行梳理和分析，尤其是在投保人

更换保险公司的场景下，数据连续性的意义不言而喻；能够用智能合同代替人工合同，有利于合同公平地执行，无论是投保人–保险人、保险中介–保险人还是投保人–保险中介的关系，都能在订立合约、索赔理赔时通过区块链技术杜绝虚假信息和恶意行为；能够有效追溯和标记投保标的信息，有助于进一步改进产品，精准评估风险。

当然，看似完美的区块链技术在实际应用中仍然存在着技术上的瓶颈，主要体现在耗能大、存储空间不足、处理效率不够等方面，并在可期的未来对保险监管将产生一定冲击。

（二）人工智能

人工智能可简单分为计算智能、感知智能和认知智能，计算智能顾名思义，就是通过大量数据进行学习和积累，如围棋界赫赫有名的AlphaGo；感知智能层次的计算机可以与用户进行互动，如无人驾驶汽车；当计算机达到认知智能时，能够进行类人类的推理和预测，如智能医生等。这些智能都通过计算机的强大数据处理能力和对人类思维方式的模仿、学习，提高工作效率和精度，减少工作中人为的扰动因素。

人工智能目前可以解决的行业痼疾主要集中在需要运用大量人力进行处理、但极易产生委托代理问题和信息不对称问题的领域。在营销过程中，智能机器人对保险中介的替代可以在一定程度上降低渠道费用、提高营销团队专业性、降低投保人退保率，同时还能够促使消费者在场景中主动思考自身风险，对自身风险进行积极的管理。在核保、承保和理赔过程中，以人工智能为核心的无纸化系统可以减少重复性的人工工作，降低运营成本，加快环节流转，提高正确率，减少保险欺诈。在厘定费率的过程中，人工智能和其他科技技术的结合，能够个性化评估风险，提高精算和实际风险水平的契合度，并使部分过去不可保、不愿保的风险转化成可保、能保、愿保的实际产品，扩大了保险人的服务范围。

人工智能带来的变化正影响着保险市场的每一个角落，但人工智能还不能完全替代人类的作用，在复杂问题、沟通态度等方面还有赖人工解决，且保险和计算机专业的双料人才不足的问题也日益凸显，这些都是人工智能有待改进的方向。

（三）物联网

物联网以互联网为基础，通过传感设备搭建一个物品识别和管理的自动化系统。物联网目前

较为成功的使用，主要包括车联网和可穿戴设备。车联网有助于打破传统“保险随车走”的模式，创新“保险从人、保险从用”的方式进行费率厘定，使保险定价更为精准、风险管控更加到位、信息不对称得到控制、理赔成本逐渐减少，也能使消费者拥有更多的选择，创造车险市场的细分子市场。可穿戴设备在医疗上的使用是物联网的另一大亮点。可穿戴设备对被保险人健康的管理，实现消费者和保险人的双赢局面，降低发病率和死亡率，减少赔付，并加强了保单主体间的联系，无形中提高了客户对保险人的品牌忠诚度。除此之外，智能家居等方向也是物联网大展身手的领域，智能家居和家财险产品的合作使得家庭风险进入智能化管理时代，在智能家居和移动设备的辅助下，实现事先做好风险预防准备、及时通知户主和保险公司、自动联系援助的一条龙保险服务。

目前，物联网的软硬件还有待进一步的发展。从前景角度看，物联网的运用可能会在一定程度上削减保费，但也有利于助推保险公司进行彻底的改革，跳出“收取保费-进行理赔”的粗放模式，实现真正的风险管理服务的转型。从技术角度看，智能家居普及度不足、智能度不高，与通信运营商的合作有待加强、法律法规尚未出台等缺陷都限制着物联网的发展。

（四）云计算

云计算是一种利用互联网实现资源实时申请、快速释放的新型计算方式，目的是帮助用户高效地访问共享资源。为了实现这一目的，云计算在数据存储、管理、编程等技术上都进行了创新，以满足海量存取、高速吞吐的客户需求。云计算高效、快捷、数据庞大的特点，使得其可以广泛运用于保险业的定价中，并尝试解决保险市场的信息不对称问题。

用户保险信息的全行业共享可以通过云平台来实现，并通过云计算技术存储和管理，进而改善精算定价，并减少消费者的逆向选择问题。同时，云计算、人工智能和大数据的结合，使得保险产品的潜在客户更容易被识别、识别成本更低，使得保险公司可以将资金有计划、有重点地进行投放，效用最大化地提升服务质量，及时挽留易流失客户、识别保险欺诈案例，同时也使得客户能够更好地根据自身风险特征打造属于自己的保险一揽子计划。云计算提高了信息的实时交互性，有利于构建标准化的工作流程，加快了保险的审核、理赔环节速度。

尽管云计算技术有着种种好处，但仍然存在着一些瑕疵。云计算，尤其是公用云和混合云的安全性仍然较低，没有了信息安全，就谈不上对云计算技术进行运用。同时，目前云计算的应用较

局限于基础设施层服务，尚未达到云管理的层次，在云计算技术和保险交叉领域的人才储备也不够充沛，定价也未达成市场统一，这为使用云计算、创新云计算带来了一定的问题。不过，随着国家政策的推进，政府行动的落实，学界增加的关注，相信这些问题在未来都能够得到妥善的解决。

（五）大数据

顾名思义，大数据技术就是通过研究海量的、价值密度低的、高速动态的、多样的数据，关联数据散点间的联系，从点到线，从线到面地进行深入挖掘，发现尚未展现和被研究的热点、难点，并辅助企业和政府进行战略性的布局。

大数据和云计算相辅相成，大数据需要借助云计算的高效能力，云计算需要使用大数据的庞大信息，共同解决保险行业存在的客户拓展成本高、产品同质化严重、产品创新性不强、定价不精准、理赔难等问题。

因此，通过使用大数据技术，保险人可以对客户进行类型细分，精准定位客户需求，实现差异化定价和差异化产品。计算机也通过大量数据的学习和积累，加快对索赔请求的处理，降低失误率。

相对于其他几项技术，大数据技术的运用更为成熟，一旦大数据技术和区块链技术、云计算技术有了更深的融合，能够实现信息的完整迁移，则大数据在保险行业的运用就能打破公司的壁垒，实现全行业的提升。

（六）车联网

车联网是物流网在车辆管理方面的具体表现，通过车辆状况、位置、速度和路线构成了信息网络，实现对车辆的自动化管理。随着技术的发展和创新，车联网逐渐形成了三个层面，基础运行层面通过硬件设备完成相关的信息采集，实现和驾驶员的交流反馈，完成对机动车的参与管理；中层交互层面通过相关数据拓展相应服务，实现社会服务和车辆的交互，提供包括道路救援、车载娱乐、维护保养等在内的服务；高层流通层面则根据庞大的信息量进行分析和深入研究，得出结论以供国家政策、法律法规、学界业界进行参考，并进行相应的变革。

车联网技术完全具备物联网技术的优势和缺陷，随着车联网的推广，保险公司，尤其是以车险和相关保险为主营业务的财险公司产品或将发生本质性的变化，既可以根据驾驶行为风险进行产

品定价，也可以通过消费者的驾驶里程进行定价，将开拓市场的目光从车转向人，紧紧围绕消费者这一核心，减少资源错配，提高客户续保率。

要使车联网能够真正服务保险行业，保险人必须拥有一定的前瞻性，通过提早合作、及时进军、预留接口等方式使自己参与到保险科技的进程中，同时加强对个性化需求的研究。

（七）无人驾驶汽车

无人驾驶汽车是人工智能在汽车领域的突破，是自动驾驶的升级版本，它通过车载的传感系统对环境进行感知，模仿人类对行车路线进行规划，最终对车辆实现完全控制，以完成人类的预设目标。目前，对无人驾驶汽车的研究已经在世界各地如火如荼地展开，一些自动驾驶车辆也已经出现。

无人驾驶汽车的面世有望大幅减少机动车事故率，并对车险及相关保险产生极大的冲击。首先，事故率的降低使得保险保费不得不大幅降低，这将改变现行车险的盈利模式；其次，无人驾驶汽车使得保单责任主体中汽车厂商和经销商的责任加重了，如何分割责任，如何界定事故赔付标准，汽车责任保险是否会替代机动车保险，这些问题进一步带来了保费分割和收取的问题，都需要保险人进行进一步的调研和设计。不仅如此，全球无人驾驶汽车的先行者——特斯拉已开始涉猎车险服务，通过一次购买终身负责的方式吸引客户，保险公司如何与汽车厂商进行业务竞争，也是保险人不得不深入思考的问题。

（八）无人机

无人机是无人驾驶航空器的简称，指的是驾驶员无需登机操作的各式航空器，通常利用无线电遥控设备和自备程序对飞机进行操控，包括了地面系统、飞行系统、任务载荷和使用保障人员四个组成部分。

无人机机内无驾驶员的特点使得无人机可以代替人类进行一些危险的、复杂的、费时的工作，在保险领域主要表现在查勘定损方面，无人机的空中优势使得难以进入的地区、十分广阔的面积、危险复杂的状况不再需要查勘定损人员亲临现场，既能够有效指导客户开展灾前预防，应付突发灾难，及时赶赴受灾现场，也可以保护查勘人员的安全，降低人工成本，并通过无人机设备和计算机的连接，更精准、更全面地对损失进行评估。无人机的出现也促进了无人机保险的产生，覆盖无

人机作为财产的风险和可能产生的责任风险。

当下，无人机技术仍然面临着一定的挑战。由于锂电池受到无人机体型的限制，目前的续航时间普遍低于30分钟，且无人机目前的上手仍然要求一定的操作技术，难以满足用户的普遍需求。同时，如何解决无人机的空中碰撞、网络攻击和货物掉落的问题，仍然是这项技术必须回答的提问。

（九）基因检测

顾名思义，基因检测就是对人体的基因进行检查，以检测基因缺陷、筛查基因病，将致病风险及时扼杀在摇篮中。目前，对单基因病的防治已经有了重大突破，对基因位点缺陷的检查也使得许多人为医疗悲剧不再上演。不仅如此，随着基因检测手段的发展，其成本大幅度下降，正式成为了普通居民也能用得起的商业技术。

基因技术的快速发展为保险市场带来了新气象。基因检测有助于帮助保险人对投保人的疾病提前预防，并降低投保人隐瞒病情或疾病遗传史等信息造成的道德风险，有助于进行差别定价和险种创新。当然，基因检测也许会使得投保人的逆向选择严重，保险人的拒保情形增加，这需要保险人和监管机构认清基因检测技术发展之后的寿险承保模式的改变，合理地通过新的精算方式、新的制度建设来规避风险、服务用户。其次，目前基因技术如何参与保险定价和健康管理仍然有待商榷，在科学上存在依据不足、样本数量不够的状况，在法律上可能涉及对用户隐私权的侵犯，这些可能都需要等待科学、伦理学和法学的进一步发展，当然，保险公司可以先行一步进行数据的探讨和抓取，在基因寿险领域及早布局设点。

（十）可穿戴设备

可穿戴设备是一种通过软件支持进行信息交流的便携式设备，是物联网的另一个具体应用，眼镜、手环、服装等都可以成为可穿戴设备，由于可穿戴设备直接接触人体的特点，目前，可穿戴设备的主要应用领域是医疗与健康领域。

可穿戴设备的出现或许将加快保险产品差异化、个性化的发展趋势，通过对人体健康状况的实时监测，对个体风险进行准确评估，实现费率的差异化，也实现对数据背后的个体需求的关注，鼓励民众保持健康的生活习惯，联合医疗机构对用户进行一条龙式服务。可穿戴设备还能和基因检测技术一样，减少信息不对称的情况，降低投保人的道德风险。

目前已经较广泛应用的可穿戴设备也存在着一定的不足。可穿戴设备的智能性还有待提高，主要体现在硬件和电池的大小和质量、记录数据的准确度和多样性及造价上，另外，可穿戴设备的软件专业性和数据安全性也有一定的提升空间。愿意购买可穿戴设备的人群往往是健康管理意识较强的人群，这就需要保险公司进行进一步的推广和普及。

（十一）点评

保险科技中的每一项技术都不是独立存在的，产品和服务的创新、运用和发展往往离不开多项技术的揉合和互相渗透。比如，人工智能和大数据的搭载产生了对客户需求的精准定点，而这种定点又不能脱离云计算技术的高速便捷而存在；车联网是物联网的一种表现形式，但其又通过区块链、云计算和大数据来实现信息的交互。这也是上文技术介绍中存在交叉和重复的主要原因，只有更好地理解这些技术的共生共用，才能更好地将科技运用于保险中，服务保险消费，提振保险生态，改革保险监管。

四、保险科技市场发展

（一）创新渠道

保险科技的创新主要发生在保险产品设计、营销、企业运营和信息资讯四个方面，分别涉及产品、渠道、管理和信息四个环节。

（二）产品创新

运用保险科技进行产品创新覆盖了寿险和财险的方方面面，体现在车险、企业/商业险、健康/旅游保险、寿险/家财险、物品险、再保险等多个领域。

其中，车险的主要创新是车联网技术，尤其是手机车联网技术突破了车载设备的缺点，使设备跟人走，为保险“从人从用”打下了良好的基础。企业/商业险创新中，企业雇主只需要提供的信息，相应的平台就会快速给出商业保险产品报价，帮助企业选择合适的保险计划。在健康险创新中，已经有了该领域的平台，产品迭代速度高、保障性强，并对用户进行持续跟踪和干预，有助于打造消费者的个性化选择。寿险和家财险创新领域的佼佼者连接了租房与保险，以平台作为风险控制和审核的主体，帮助租客和户主进行匹配。物品险越来越受到人们的重视，过去难以单独投保

的财产随着个性化需求的攀升，也迎来了保险科技创新者的青睐。投保人可以通过平台单独投保某一物品，在平台内进行数据匹配或通过数据库自行添加数据条目完成投保，并能根据个人安排随时开始或终止保险，真正实现了“灵活、按需”。再保险团队则提供了个性化的风险转移策略和资金管理办法，创新了机构客户进行风险识别和管理的手段。

（三）保险营销

营销渠道的创新是载体的创新，保险比价平台为消费者提供了更大的选择面、更个性的选择和更直观的体验，成为了供给方和需求方的沟通桥梁，提高了保险市场的信息透明度；员工福利平台简化了企业在人事管理和员工福利上的管理工作，并能协助企业对接医疗机构；保险公司还积极运用其他有审核环节的平台的客源，通过加入相关的保险产品实现精准营销；此外，场景化和优选化的营销方式也在不断发展中，在这种营销模式下，客户能够主动寻求保险产品进行风险转移，也能够较容易地寻找到适合自身风险特征的保险产品组合；P2P保险的创新则依托现实关系，通过优惠等手段鼓励亲朋好友建立保险互助关系，有利于提高客户黏性，拓展客源。

（四）企业运营

企业运营的情况在一定程度上决定了企业的竞争力和未来可能达到的高度。企业管理平台的搭建、保险管理设施的建设和对技术的运用等都是企业运营的创新方向。保险管理平台能够在线管理保险产品，方便企业雇主及时发现风险漏洞，快速购买保险产品；保险数据方面的创新使得建模、获取信息和商业智能化管理更加科学、及时、低价，便利了保险公司对风险的快速、准确识别；保险管理设施的建设通过业务系统平台对各个环节应用程序设计实现，使得保险公司业务更能够流水化、标准化开展，便利保险公司决策，压缩人为干预，提供持续优化服务和管理的可能。

（五）信息资讯

保险行业的信息资讯表现为教育培训、信息披露和社会监督，并在保险教育、保险资源和新媒体方向有了一定的创新。

创新性的保险平台既提供包括保险产品在内的保险资讯，给予消费者便捷的在线或当面交流、咨询机会，也为保险消费者们提供高质量的保险教育，指导消费者进行与保险相关的活动。新

媒体的发展也为保险信息的传播和保险产品的广泛宣传提供了优质的载体。不论是微博、微信还是其他平台，保险公司通过创新活动形式、创新产品内涵，在传统产品的基础上进行文化包装、形式包装，在新媒体上吸引潜在消费者注意，进而推广自身产品和公司品牌。新媒体的作用远不止于简单地提供一个平台，更在于通过专业的媒体人发声，实现和客户的双向沟通，这有助于打造良好的公司形象，实现良性循环。

（六）市场发展

近年来，保险科技的热度不断上升，从投资力度、企业数量等方面可窥一斑。

从投资力度角度看，仅2016年就有超过170项相关投资，投资规模逾16.9亿美元。其中，美国市场的保险科技投资最多，并有一半发生在健康保险领域；德国的投资发展较为成熟，保险科技的融资已经进入了中期阶段；英国、新加坡等国家也大力发展保险科技项目，投资增长迅速。

从企业数量角度看，目前共有1302家保险初创企业活跃在16个不同领域中，在北美、中国、东南亚、澳洲等国家和地区都有大量分布。这些公司主要从事保险比价、保险公司基础设施与后端支持、车险、健康旅游保险等领域，并获得了投资者的青睐。

五、国际保险科技监管

本章主要探讨中国、中国香港、新加坡、英国、美国和德国的保险科技监管现状。监管部门主要通过表达支持态度并扶持、提供资金、使监管适应金融科技/保险科技的新发展等手段鼓励和规范金融科技/保险科技的发展。

所有的国家都表达了对金融科技/保险科技发展的支持，鼓励创新、促进合作，加强与相关企业的沟通交流。中国政府通过李克强总理的政府工作报告指出要“制定‘互联网+ ’行动计划”；中国香港建立了专用的金融科技/保险科技平台加强监管者和行业的交流；新加坡成立了金融科技办公室以提供相关事务的一站式支持；英国政府发布《金融监管新方法：改革蓝图》，新设三个机构对金融机构和事务进行监管；美国政府发布《金融科技框架白皮书》，鼓励传统市场与新兴科技共生共荣，鼓励政府、科技公司和金融机构间继续加强跨部门的协作；德国政府通过推出FinCamp活动，促进政府、金融业和金融科技企业的对话。

从提供资金上看，中国香港和新加坡都通过资金支持鼓励企业和个人进行项目申报，实现金

融科技/保险科技的创新，中国和英国都通过提供赋税优惠鼓励行业创新，德国和欧盟也为这些初创企业提供创业支持计划，主要通过给予贷款上的优惠来实现。

监管当局还通过不断改良自身结构和规章，顺应市场发展的规律，引导行业快速、健康地发展。中国政府统一了金融科技企业的行政审批，并着手对行业暴露出的部分问题进行监管规则的探讨；中国香港成立了特别工作组，保险监管机构和其他部门正共同探究如何促进保险行业创新，并强调将支持科技中立准则，重视投资者保护；新加坡则允许保险科技创新企业在一定条件下可以不必获得金融管理局的批准，直接推出创新产品，鼓励了大胆和快速的行业创新，并成立了金融科技与创新小组使得法规能够适应现实的需要；英国的监管沙盒制度为创新提供了实验区，并通过孵化器和创新中心帮助创新、提出建议；美国政府继续强调金融科技/保险科技应该以消费者为主，保证安全、健康、透明、高效，并鼓励发展行业技术标准，指出政府将帮助行业克服潜在技术偏见、提高透明度、识别不利于金融稳定的风险；德国政府则认为要在严厉的监管和对创新的鼓励中寻找一个平衡点。

六、中国保险科技发展建议

综合讨论保险科技在全球的发展领域、发展状况后，我们认为和呼吁，要促进保险科技在中国的进一步发展，使中国保险业、科技业能够把握新一轮的发展潮流，成为全球保险科技的领头羊。首先，需要制定相关法规和政策，构建适度宽松的发展环境，借鉴保险科技发达国家的先进做法，成立专项办公室，加强各方主体的沟通，提供资金、贷款和赋税的优惠，加强对行业的规划、引导；第二，要联合保险科技生态主体，建设沟通合作平台，仿照监管沙盒制度为创新预留实验区，加强行业和监管者的有效互动，共同确定未来发展方向，鼓励技术在传统保险行业中的运用，在为相关创新企业提供便利的同时，也要提高政策、资金和企业信息等方面的透明度；第三，应该加强数据管理，保障信息安全，保护网络安全、信息安全、隐私安全；第四，要组织开展保险科技应用示范，优先选择保险发展良好、信息产业基础扎实的城市和地区开展试点工作，形成一批优秀的示范项目，累积相关经验；第五，要建设保险科技人才培养体系，加强产学研用结合，鼓励和支持高校开设保险科技课程，培育跨专业复合型人才，提供资金推动专项研究、产研联动和专业人才培训机构的设立；最后，应该加强国际交流与合作，重视其他国家和地区的政策、规划、监管手段，鼓励企业“开眼看世界”，积极投身新兴事物、积极参与标准的制定。

The Development of InsurTech in China (Whitepaper): executive summary

1. Overview

1.1 The background of InsurTech development

The development of Insurance Technology "InsurTech" is closely related to the evolution of financial technology "FinTech". Originally, it was one of branches under the "FinTech" umbrella that specifically focuses on the insurance industry, but now it is recognised by public as a distinguished term due to its significant role in the economy. Firstly, along with the strength of insurance market, the interest of investing InsurTech startups has been growing rapidly. Secondly, the large multinational financial institutions are moving their focuses back to the main traditional business after the financial crisis, where new startups and technological innovations will play a dominant role to improve performance and to compete in the future. Finally, as the recent report of World Economic Forum mentioned, when facing an extraordinary speed of technological development and replacement and innovation in the financial system, the insurance industry has the most challenge to adapt it. All of these facts make InsurTech very important in the process of strategic planning and business development among the insurance companies, technology firms and startups.

1.2 The definition and goal of InsurTech

Generally speaking, the focus of InsurTech is more "technology" than "insurance." It applies a combination of the latest, emerging, and advanced technologies to the insurance industry, such as: Blockchain Technology, AI, Big Data, Cloud Computing, IoT, etc. Broad applications include: insurance product innovation, sales distribution, improving management and operation within insurance companies, as well as through building new platform or developing new technologies to serve customers better.

The core concept of InsurTech is focused on using "technology and innovation" to improve, enhance, and

expand the existing insurance business, rather than purely creating and providing insurance for new technologies or innovations. The progress in new technology offers more granular ways or opportunities to penetrate and improve the daily life of ordinary people, as well as serve the society better through a well-functioning insurance market.

The demand from customers promotes the development of InsurTech, and also change the behaviours of customers. InsurTech makes customers better recognise, understand, emphasize, and manage risks in order to reduce risks, improve their quality of life, and further improve the quality of service and achieve the primary goal of the insurance market.

2. The eco-system (environment and development) of InsurTech in China

2.1 The potential of insurance market

The fast development of Chinese economy provides a strong support to the impressive progress of insurance industry. The size of total asset in the insurance market exceeded 15 trillion RMB in 2016, achieved a compound growth rate of 24% during the past ten years, as well as in a period with rapid but stable growth of premium revenue. In fact, the growth of premiums in major insurance lines are higher than the growth of Chinese GDP during the same period, such as (written) premiums in life insurance, P&C, emerging health insurance, accident insurance and so on.

No doubt, China has not only become one of countries in the world with a large GDP, but also has a big insurance market where the market size is approaching the US or Japan and the premium revenue ranks among the top group in the world. However, being "big" is not equivalent to be "strong;" Chinese insurance market still appears to have few problems, such as a low penetration of consumers, neither density nor depth of insurance is high, and its impact to the economy is limited, etc. Comparing to other financial markets (e.g. banking and securities industry), the share of insurance market is still very low. This reflects the potential and the space for development of the insurance market in the near future.

2.2 The value composition/component of insurance market

Understanding the value composition of insurance sector helps to better understand the potential structural shocks and changes that is caused by and contributed by InsurTech.

In life insurance, not only are endowments and annuities popular in the market, but both health and accident insurance are also becoming popular. In the non-life sector, motor insurance still steadily occupies 73% of the market share, together with property, liability, agriculture insurance that also have a few certain and stable market allocation.

Insurance policyholders, the agents in sales distribution, shareholders, and government organisations are all linked together in the value chain. Based on the written premiums, the equity of shareholders and the allocated insurers' capital accumulations, the value compositions involve the cost of claims, the cost of sales, operational cost, profit/loss allocation and tax, etc. From the perspective of life insurance companies, the difference of reserve part is not large, but other parts are different significantly depending on the strategy and business plan of each individual company. In terms of non-life insurance companies, both the costs of operation and distribution are similar, but other parts of cost are closely related to each company's claim policy and product structure. In fact, these structural differences may be the focus and potential contributions of InsurTech.

2.3 The eco-system of InsurTech

The InsurTech Eco-system mainly includes seven groups: traditional insurers, insurance intermediaries, consumers, InsurTech startups, dominant firms in other industry, financial institutions (investment firms) and insurance regulatory authorities. Different groups have their own special areas, but also interconnect and interact with each other.

Traditional insurers are the important part of the eco-system, not only being the main suppliers of insurance product and service in the market, but it is also currently one powerful force of participating or

investing in InsurTech. Through developing applications, forming individual departments and subsidiaries, investing starups, seeking collaborations, and other possible ways to be a part of the InsurTech evolution. Insurance intermediaries are affect by InsurTech more significantly, so they have already been preparing for the changes and emphasizing their advantages to bridge the interactions between consumers and insurers, in order to strengthen their important roles and enhance customers' trust. Insurance consumers are the demand side of the eco-system, the reforms in the supply side and the development of InsurTech will provide consumers more affordable and relevant products and services, offer open and transparent choices, and silently change the purchasing behaviours of consumers, increase risk awareness, build close relation and efficient communication, and a proactive insurance consumption will become a "new normal". Meanwhile, although the group of InsurTech startups is not a main part of the traditional insurance eco-system, it has an indispensable role in the InsurTech eco-system. Startups expand the scope of insurance services and play a role of "using technology to promote service" in the life, property and health insurance sectors. This is done by changing the process of information gathering, data analysis, in order to make the services more accurate, safer, more efficient and intuitive (e.g. the integration between health/medical services and the process of data collection from driverless vehicles or wearable technologies). The group of dominant firms in other industries mainly consist of companies in both upstream and downstream of insurance business chain. They are the main representations in InsurTech, such as the integration between car manufacturers and technologies for Internet of Vehicles (Telematics), their corporations with internet enterprises, medical companies and the insurance industry. Financial institutions (investment firms such as venture capital, etc) are the promoters of the InsurTech eco-system. They are not only the barometer of the InsurTech to indicate the hotspot of investment opportunity within the field, but also the booster of InsurTech startups through investing abundant capital, excellent management experience/expertise that assists InsurTech quickly set sail and grow toward the right direction. The insurance regulatory authority is the "night watchman" (goal keeper) of the InsurTech eco-system, and at the same time bear the responsibility of encouraging, guiding and supervising the system, for the healthy development of InsurTech.

3. The applications (applied technologies) in InsurTech

3.1 Block chain technology

Block chain technology completes the work by establishing six steps such as: generating electronic information, encryption, confirming transaction, real-time broadcasting, adding block, and network copying/replicating records. Through these steps, the message within the block chain transmission and storage has six characteristics: decentralization, openness, transparency, autonomy, data non-tampering (non-modifiability), and anonymity. These features provide a reliable solution to the situation in the past, such as low information security, poor information continuity, high cost of collecting/gathering information, high restriction in spreading/distributing channel, and prominent problems from information asymmetry. Decentralization decreases the dependence of insurance on the third-party intermediary, so it benefits to have the reduction of cost and the development of mutual insurance. Openness reduces the information asymmetry between supply and demand sides, which is beneficial to overcome the difficulties of pricing and analysis in the past. Transparency, anonymity and data non-tampering make insurance data/information more convenient, fast, accurate and continuous, providing security to solve the privacy issues of policyholders. Finally autonomy, aside from human disturbance reduces the cost of manpower, reduces potential disputes from contract implementations.

At present, the use of block chain is mainly to follow directions. The use of block chain technology can quickly carry out identity verification and information calibration, and achieve separations between data and enterprise, so that authorized third parties can arrange and analyse data individually; this is true especially in the case of the insured person changes the existing insurance company, the significant benefit and flexibility of data continuity is obvious. Furthermore, it can replace the traditional contracts with intelligent ones, which is conducive to the fair execution of contracts, whether it is a relation of policyholders-insurers, insurance intermediaries-insurers, or policyholders-insurers, all can eliminate false information and malicious behaviours through implementing block chain technology when entering into contracts and dealing with claims. Finally, it can effectively trace and record the information of the

insured target, which will help to improve the product and assess the risk accurately.

Of course, some technical bottlenecks of (seemingly perfect) block chain technology still exist in the practical applications, as mainly embodied in the energy dissipation, insufficient storage space, inadequate processing efficiency, and there is a certain complex impact on the insurance regulation in the foreseeable future.

3.2 Artificial intelligence

Artificial intelligence (a.k.a AI) can be divided into computational intelligence, perceptual intelligence and cognitive intelligence. Computational intelligence, as the name implies, is to learn and accumulate useful knowledge through a large amount of data, such as the famous AlphaGo in the chess industry, and computers that perceive the intelligent level can interact with the users, such as driverless cars. When the computer reaches cognitive intelligence, it can carry out the reasoning and prediction of human beings, such as intelligent medical practitioners. All of this intelligence through the computer´s powerful data processing ability and the way of human-kind thinking imitation, learning, improve efficiency and precision, reduce the work or issue of man-made disturbance factors.

AI can currently solve the industry-level issues, which require a lot of manpower. These issues are also subject to generating the problem of principal-agent or information asymmetry. In the process of marketing and distribution, the substitution of intelligent robots to insurance intermediaries can reduce the cost of distributing channel, improve the professionalism of marketing team, reduce the surrender rate (maintain a higher retention rate) of policyholders, and also enable consumers to actively think about their own risks in the scene and manage their own risks proactively. In the process of broking, underwriting and claiming, the paperless system with artificial intelligence as the core can reduce repetitive manual work, decrease operating costs, accelerate the circulation of links, improve the accuracy rate, and minimise insurance fraud. In the process of determining premium rates, the combination of artificial intelligence and other technologies, can personalize the individual risks,

improve the conformity and consistency of actuarial and actual risk level, and some of the non-insurable or un-willing to be protected risks in the past can be transformed into insurable and protectable or willing to be protected actual products, which expand the scope of the insurer´s service.

The progress in artificial intelligence is affecting every corner of the insurance market. However, AI cannot completely replace the role of human, particularly in complex issues. It is still necessary for human with positive attitudes to deal or solve the communication issues with customers, and the prominent personnel shortage of workers with expertise in both the insurance and computer science become more and more obvious, these are the main directions of artificial intelligence to improve in the space of InsurTech.

3.3 Internet of things (IoT)

The Internet of Things is based on the internet and builds an automated system for implementing identification and management of goods through sensing devices (via connected sensors). The IoT is now more frequently and successfully applied in telematics (Internet of Vehicles) and wearable devices. The telematics help to break the traditional "insurance-go-with-cars" model. Changing to the innovative "insurance-move-with-people, or usage-based insurance (UBI)" of the way to determine the premium rate, and making insurance pricing more precise, better risk management, can enable consumers to have more choices, and to create motor insurance as a “fine-molecule” market, while information asymmetry is controlled and the cost of claims is decreased gradually. The use of wearable devices in medical care is another highlight of the IoT. Through wearable devices to manage the health of the insured, achieve a “win-win” situation between consumers and insurers, reducing both morbidity and mortality, decreasing premium/claim payment, and strengthening the relationship between the main parties (customers and insurers) in the insurance policy, virtually improve the mutual trust and brand loyalty between two parties. In addition, smart home and other applications also have potential in the field of IoT, the integration between intelligent home and home insurance products makes the intelligent era of managing the family risks. With the assistance from the smart home and mobile devices, preparing and achieving

risk preventions in advance, timely notifying the home owner and its insurance companies, forming an automatic one-stop assistance and insurance service.

At present, both the hardware and software of IoT still require further developments. From one perspective, the use of IoT may reduce premiums to a certain extent, but it is also beneficial to the insurance companies to carry out thorough reform. For example, by jumping out of the "charging premium and repaying claims" extensive model, it can achieve a real risk management service transformation. From the technical point of view, the popularity of smart home is still insufficient, the level of intelligence is not high, the cooperation with the telecommunication operators still wait to be strengthened, the law and regulation have not yet promulgated and discussed maturely that are restricting the development of IoT.

3.4 Cloud computing

Cloud computing is a new method of computing that is based on the internet to achieve real-time operation and use of online resources, which is designed to help users efficiently access the shared resource. To achieve this goal, cloud computing has been innovative in data storage, management, programming, and so on to meet the customers' needs of mass-access and high-speed throughput. It has some main features, such as: highly efficient and fast computing power, store and handle large data sets, therefore it can be widely used in the pricing of insurance, and try to solve the problem of asymmetric information in the insurance market.

The industry-wide sharing of users' insurance information can be achieved through cloud platforms, as well as its storage and management through cloud computing technologies, thereby improving actuarial pricing and reducing consumers' adverse selection issues. Meanwhile, the combination of cloud computing, artificial intelligence and big data makes it easier to identify potential customers of insurance products. It not only reduces the cost of customer identification and verification, so that insurance companies can plan and focus on the extra funds to invest, but it also provides other functions such as

maximise its utility to improve the service quality, timely maintain the retention rate of customers, identify potential cases of insurance fraud, but also enable customers to better manage their own insurance portfolio based on their own risk characteristics. Cloud computing improves the real-time interactivity and interaction of information, facilitates the construction of standardized workflow, and accelerates the auditing of insurance and the speed of dealing with claims.

Despite many benefits of cloud computing technology, there are still some flaws. Cloud computing, especially the security of public cloud or hybrid cloud is still low. Without assuring the information security, the use of cloud computing technology is meaningless and limited. At the same time, the application of cloud computing is currently limited to the layer of infrastructure services, and has not yet reached the level of cloud management. Furthermore, the pool of personnel with both cloud computing technology and insurance knowledge is not sufficient and the process of pricing is still not a market unification, these situations bring problems for the industry to use of cloud computing or create cloud-based innovations. However, with the advancement of state/national policies, the implementation of government action and plan, the increased attention of academia, it is confident to believe that all of these problems can be solved properly in the near future.

3.5 Big data

As the name implies, big data analytics is based on the research of massive, low-value density, high-speed dynamics, and diverse data that is associated data with scattered points, from a point to a line, from a line to a surface to perform data mining, discover those hotspots or difficulties/problems that have not yet been demonstrated or studied, and assist enterprises and government to make strategic plans.

Big data and cloud computing complement each other. Big data relies on the high efficiency of cloud computing, while cloud computing needs to use big data analytics to provide information from data, in order to solve some common problems in the traditional insurance market, such as: providing a common

solution to the high cost of identifying new customers, serious issues of product homogeneity, weak product innovation, less precise pricing, issues of claim difficulty, etc.

Therefore, by using big data analytics, the insurer can classify the customers by type, accurately locate the customers' demands or requirements, and realize the differentiated pricing and product differentiation. The system also accelerates the process of claim requests and reduces the error rate through the study and accumulation of large quantities of data.

Compared with several other technologies above, the application of big data analytics is more mature. Once there is the close integration of big data, and block chain technology and cloud computing is more advanced that is able to perform the full migration of information, then the application of big data in the insurance industry can break the company´s barriers to achieve a good progress of the whole insurance industry.

3.6 Telematics

Telematics is the concrete manifestation of the logistics network in the vehicle management, which forms the information network through the vehicle condition, position, speed and route, to realize the automatic management of the vehicle. Along with the development of technology and innovation, the network of vehicles (telematics) has gradually formed three levels. Firstly, the level of basic operation through the hardware equipment necessary to complete the relevant information gathering to achieve the interactions between the driver and the vehicle, and completes the participation of motor vehicle management. Secondly, the level of middle interaction extends the corresponding service through related data to achieve the interactions between the social life and the vehicle, providing relevant services including road rescue, on-board entertainment, maintenance and so on. Lastly, the level of high circulation is to analyse and research the enormous amount of network information to achieve useful conclusions, which can assist the state/national policy, to suggest laws and regulations, and as a reference for the academia and the industry, for planning or implementing some corresponding changes.

The technology of telematics is fully equipped with both advantages and disadvantages of the IoT, with the promotion of the telematics, insurance companies, especially motor insurance and related P&C insurance products, will have an dramatic change. Not only it can be based on the risk of driving behaviour to price insurance products, but also through the consumer driving mileage to price premium will open up the market´s vision from the insured car to people and start to focus on the centre of consumer. This will reduce the mismatch of resources, improve customers' renewal/retention rate.

In order for telematics to truly serve the insurance industry, insurers must be forward-looking through early collaboration, timely implementation, the reservation of necessary interface and so on to participate in the evolution of insurance technology, while strengthening the study of personalized demand.

3.7 Driverless car (autonomous vehicle)

Autonomous vehicle, or driverless car, is the breakthrough of artificial intelligence in the automotive industry. It is an upgraded version of automatic driving. It is based on the vehicle sensor system to perceive the environment, imitating the human driver to plan travel routes, and ultimately complete full control of the vehicle to achieve the pre-defined goal of human driver. Currently, research on driverless cars has been in full speed around the world, and some autonomous vehicles have been emerged.

The advent of driverless cars is expected to dramatically reduce motor vehicle accidents and will have a tremendous impact on auto insurance and related P&C insurance. Firstly, the reduction in accident rate makes insurance premiums decrease substantially, which will change the profit model of the current motor insurance. Secondly, driverless cars shift the main body of insurance policy to an increased liability of the car manufacturers and dealers. Questions such as: how to divide the responsibility, how to define the accident compensation standards, whether motor liability insurance should replace motor vehicle insurance, will further promote the issues of premium segmentation and collection. All of these issues need the insurers to carry out further research and production design. Besides, the global pioneer

of driverless cars (i.e. Tesla) has already begun to enter into motor-insurance services through providing a lifetime of responsibility (insured service) for its products to attract customers. Insurance companies needs to think carefully on how they can compete with the car manufacturers.

3.8 UAV (Unmanned Aerial Vehicle)

UAV is the abbreviation of "unmanned aerial vehicle", which refers to all kinds of aircraft that the driver does not have to check in to operate it, usually using radio remote control equipment and own designed/prepared program to manipulate the aircraft, including four components: the ground system, flight system, task load and the use of security personnel.

The driverless characteristics of unmanned aerial vehicle makes UAV a good tool to substitute for human beings to carry out some dangerous, complex, and time-consuming works. In the field of insurance, it is mainly manifested in the process of damage survey and valuation, the superiority of unmanned aerial makes those inaccessible area, very broad area, dangerous and complex situation easier (safer) to measure the damage and no longer need the investigation personnel to investigate the actual place, not only it can effectively guide customers to carry out disaster prevention, to cope with sudden disaster, timely reach to the disaster site, but also can protect the safety of investigators, reduce labour costs, as well as through the UAV equipment and computer connections to provide more precise and more comprehensive assessment of losses. The emergence of UAV also promotes the insurance products of insuring unmanned aerial vehicles, covering the risk of UAV as a property and possibly its related liability risks.

At present, the UAV technology still faces some challenges. Because the lithium battery is limited by the size of UAV, the current active life time is generally less than 30 minutes, and an advanced skill set is still required to operate the UAV technology, which all of these issues are difficult to meet the ordinary user´s universal/common needs. Meanwhile, how to protect the collision of UAV during its flight or solve network attack or prevent the problem of dropping goods, still are the questions that the UAV technology

must answer.

3.9 DNA genetic testing

As the name implies, genetic testing is to inspect human DNA, to detect genetic defects, to screen gene disease, to timely strangle the risk of disease in the cradle. At present, the prevention of single-DNA based disease has been achieved a major breakthrough, the detection of gene loci defects also make many man-made medical tragedies no longer a concern. Besides, with the development of the methods of gene detection, its cost has fallen dramatically, becoming the commercial technology that the ordinary residents can use.

The rapid development of gene technology has brought a great new space to the insurance market. Genetic testing helps insurers prevent the disease in advance and reduce the moral hazard caused by information asymmetry, such as the insured hiding the disease or genetic history. This is crucial in helping to make price differentiation and product innovation. Of course, genetic testing may also make the insurance applicant´s adverse selection problem more serious, which increases the insurer´s refusal to insure such situation. This requires both insurers and regulators to recognize the development of genetic testing technology, to update the life insurance underwriting model, to apply reasonable new actuarial methods, to implement new system to avoid risks to better service users. Furthermore, the application of gene technology in the insurance pricing and health management is still to be discussed, and there is still insufficient scientific evidence due to lack of samples. In the legal perspective, such tests may involve a violation of the user´s privacy, these may need to wait for the further development of science, ethics and jurisprudence. Of course, insurance companies can collect and explore the relevant data in advance, in order to prepare business strategies early to meet the opportunities and challenges of the DNA-based life insurance.

3.10 Wearable device

Wearable device is a portable equipment for exchanging information that support by software. It is

another specific application of the IoT, such as glasses, hand bands/rings/belts/watches, clothing and so on can all become wearable devices. Because wearable devices directly contact the human body, the main application of wearable devices is in the sectors of medical and health as of now.

The emergence of wearable devices may accelerate the differentiation of insurance products and the trend to promote personalized development, through real-time monitoring human health, to assess individual risks accurately, to realize the pricing differentiation, to realize the individual needs from mining the relevant personal data, to encourage people maintaining healthy living habits, as well as to collaborate with medical institutions to offer a full-package service. Wearable devices can also reduce the issues of information asymmetry in the same way as gene detection or genetic testing technology, and reduce the moral-hazard problem of policyholders.

At present, there are also some drawbacks in the wearable devices, even though they have already been widely used. The intelligence of wearable devices is still to be improved, mainly embodied in the size and quality of hardware and its battery. Furthermore, there are issues in the accuracy of recording data, and the low diversity and high cost of these products. In addition, the software of wearable devices still need more refinement and the data security also has a certain degree of improvement. In fact, people who are willing to buy wearable devices are often the individuals with a strong sense of health management, therefore it requires insurers to further promote it to more general populations (to public).

3.11 Comment

Every technology in InsurTech is not independent or isolated; the innovation, application and development of products and services are often inseparable from the blending and infiltration of many technologies. For example, a combination of artificial intelligence and big data help to measure or analyse the demand of customers precisely, but this level of precision cannot be existed and separated from the assistance of high-speed and convenient cloud computing. Another example, the telematics is a manifestation of the IoT, but it is also interacting with (or exchange) information through technologies of

block chain, cloud computing, and big data. This is the main reason for the intersection and repetition in the above introduction of many InsurTech technologies. Only if better understanding the coexistence of these technologies, then it can better apply InsurTech to insurance, serve insurance consumption, boost insurance eco-system, reform insurance regulation.

4. The market development of InsurTech

4.1 The innovation channel

The innovation of InsurTech mainly takes place in the following four aspects: insurance product design, marketing, enterprise operation and the process of information, which relates to the four channels: insurance product, distribution, management and information, respectively.

4.2 The innovation of products

The use of InsurTech for product innovation covers all aspects of life and property insurance. It has already appeared in the motor insurance, enterprise/commercial (liability) insurance, health/travel insurance, life insurance/home insurance, goods insurance/warranty, reinsurance and other lines of insurance business.

Among them, the main innovation of automobile insurance is the technology of telematics. The new connectivity of the mobile phone to telematics has achieved a breakthrough, overcoming the early shortcomings of the vehicle device, so that the equipment goes with the people. It builds a good foundation for offering "usage-based" insurance. In the innovation of enterprise/commercial insurance, the employer only needs to provide the necessary information, while the corresponding platform will quickly give the enterprise a quotation of commercial insurance product. help enterprises choose appropriate insurance plans. In innovation of the health insurance, there is already a platform in this field, the speed of product iteration is high, and the safeguard is strong, as well as carrying on the continual tracking and the intervention with the users, helping to build the consumer´s personalized choice. The leaders in innovations of life insurance and property insurance connect rental and insurance,

using platform as a main structure to perform risk control and auditing, to help tenants and the householders to match each other. More and more people pay attention to goods insurance/warranty, the difficulty of insuring goods separately in the past is improved with the increase of personalized demand and diversified insurance design, also attractive to the innovators of insurance technology. Policyholders' specific items can be insured individually through the platform, performing data match within the platform or through the database to add data entry to complete the purchase of insurance, as well as being able to start or terminate the contract at any time according to personal arrangements, truly achieved the "flexible, on demand". The reinsurance team provides a personalized risk-shifting/ transaction strategy and methods of financial management, to create different ways of identifying and managing the risks of institutional clients.

4.3 The marketing of insurance

The innovation of the marketing channel is an innovation of carriers. The insurance price comparison website (or platform) provides the consumers with more choices, more personalised options and more intuitive experiences. It also becomes the bridge of communication between the supply side and the demand side, which can improve the information transparency of the insurance market. The employee benefits platform simplifies the personnel management in the enterprise, and can assist the enterprise to link the medical institutions (hospitals and care centres) directly. Insurance companies also actively use other platforms to look for potential customers, by joining the relevant insurance products with the platforms to achieve more precise marketing. Furthermore, the marketing based on scene design and optimization is also evolving, customers can proactively seek insurance products for risk transfer in these marketing models, and they can also be easier to find suitable insurance product portfolio for their own risk characteristics; The innovation of P2P insurance relies on the real-world relationship to encourages friends and relatives to establish mutual insurance with a certain discounts, which is beneficial to improve customer stickiness and expand the customer base.

4.4 The operation of company

The performance of a company's operation determines the competitiveness of the company and its future success. The establishment of enterprise management platform, the construction of insurance management facilities and the application of technology are all the directions for innovation of a company's operation. The insurance management platform can manage the insurance products on-line, help the employer to discover the risks conveniently in time, and be able to buy the related insurance products quickly. The innovation of the insurance data analytics makes the modelling, the information gathering and the business intelligence management more scientific, timely, and cost-saving. It helps the company to identify and react to emerging risks more quickly and accurately. The construction of insurance management facilities through linking all individual applications altogether into one integrated operation system, which makes the insurance business more fluent, standardized, and facilitates the decision-making process of an insurance company, reduces human intervention and provides possibilities for ongoing optimization of service and management.

4.5 The information and intelligence

The information and intelligence of an insurance industry are characterized by educational training, information disclosure and social supervision. It evolves some innovations in insurance education, insurance resources and new (social) media platform.

The innovative insurance platform not only provides insurance information, including: insurance products, easy ways of building online or face-to-face communications (or exchanges) with consumers, and more opportunities of consulting consumers. Meanwhile, it provides consumers with high-quality insurance education, and guides consumers to carry out insurance-related activities. The development of new media platform (social media application) also provides high-quality carriers for the dissemination of insurance information and the widespread publicity of insurance products. Whether blogs (such as Weibo), instant messaging services (e.g. WeChat) or other platforms, insurance companies affect

consumers' culture of purchasing (traditional) insurance through innovative marketing strategy and product design. By using the new media to attract potential consumers' attention, can they then promote their own products and brands. The role of the new media is far more than simply providing a platform, but also through the professional voice of the media experts, to achieve two-way communications with customers, which helps to create a good corporate image and achieve a positive feedback loop.

4.6 The market development

In recent years, the enthusiasm of InsurTech has been rising, which can be shown both from the amount of investment (capital inflow) and the number of new startups.

In terms of the amount of investment, there are more than 170 related investments in 2016 alone, with a total investment of more than $1.69 billion. Among them, the U. S. market has the biggest share, and a half of them are concentrated in the area of health insurance. Germany´s InsurTech investment is relatively more mature, the InsurTech financing has entered in the medium-term stage. Other countries, such as Britain and Singapore, have also been widely developing InsurTech projects, and the amount of related investments has grown rapidly.

From the perspective of company number, there are 1,302 InsurTech startups in total actively operating in 16 different areas, which are distributed in North America, China, Southeast Asia, Australia and other countries or regions. These startups are mainly engaged in insurance price comparison (insurance aggregator) technology, insurance company infrastructure and back-end support, motor insurance, health travel insurance and other insurance business lines, as well as being attractive to investors.

5. The global supervision of InsurTech

This section focuses on discussing the current situations of InsurTech supervision and regulation in China, Hong Kong SAR, Singapore, Britain, the United States and Germany. The regulatory authorities encourage and standardize the development of FinTech/InsurTech through their expression of positive

attitudes and supports, as well as provide necessary funding. They also update and refine some regulations and policies to proactively adapt the developments and changes from the innovations of FinTech/InsurTech.

All countries have expressed their supports for the development of FinTech/InsurTech, such as encouraging innovation, promoting cooperation and strengthening communication with relevant organisations. The Chinese government, based on the official report (Guidance, Policy Paper) from the office of Premier (Prime Minister) Li Keqiang, indicates to "implement the strategic plan of 'Internet +' concept." Hong Kong has established a dedicated FinTech/InsurTech platform to strengthen the communications and information exchanges between regulators and industries. Singapore has set up the FinTech Office to provide one-stop support for related matters. The British government issued its White Paper on financial reform in 2011, titled "A new approach to financial regulation: the blueprint for reform", set up three new organisations to regulate financial institutions. The US government issued a White Paper titled "A Framework for FinTech" to encourage the coexistence of traditional markets and emerging technologies, and to support the continuation of cross-sectoral collaboration among government, technology companies and financial institutions. Finally, the government of Germany promotes dialogue among government, financial industry and FinTech enterprises through launching the events of FinCamp.

From the funding perspective, both Hong Kong and Singapore encourage enterprises and individuals to declare projects through financial supports, to achieve FinTech/InsurTech innovations. Both China and the United Kingdom encourage industry-wide innovation through the provision of tax benefits or incentives. Germany and the European Union also encourage these startups by providing financial support programs by granting loans.

The regulators also guide the industry to develop rapidly and healthily by continually improving its own structure and policy, and by adapting to the market development. The Chinese government unifies the process of administrative registration and approval of FinTech enterprises, and arranges discussions in relation to some existing problems exposed to the industry. For example, Hong Kong has established a

special task force, insurance regulators together with other government departments are exploring possible ways to promote innovation in the insurance industry, stressing that it will support the neutrality of science and technology, and will pay attention to investor protection. Singapore allows InsurTech innovation enterprises under certain conditions that can skip from the approval of the monetary authority, allowing them to introduce innovative products directly, encouraging more flexible and rapid industry innovation, and the establishment of the FinTech Innovation Group enables the regulation to adapt quickly to the needs of reality. Furthermore, the British "regulatory sandbox system" provides experimental space for innovation and helps innovative activities through building incubators/ accelerators and centers for innovation to offer relevant suggestions and to make recommendations. In the United States, the government continues to emphasize that FinTech/InsurTech should be consumer-oriented, ensure its safety, healthy, transparent and efficient, as well as encouraging the development of industry-wide technical standards, pointing out that the government will assist the industry to overcome potential technical biases, to improve transparency, to identify potential risks that may impact on the financial stability. However, the German government considers that it is necessary to seek a balancing point between implementing a tough regulation and offering incentives for innovation.

6. The suggestion for the development of InsurTech in China

After summarising this comprehensive discussion about the development scope and status of InsurTech in the world, we think and suggest that it is important to further promote the development of InsurTech in China, so that Chinese insurance and technology industries can capture the benefits and advantages (e.g.: positive externalities or "spillover effects") from the new trend of world InsurTech development, and can aim to become the global leader in insurance technology.

Firstly, it is necessary to formulate relevant regulations and policies, to construct a moderately loose or flexible environment for InsurTech development and innovation, to draw on the advanced practices from the developed countries, set up special offices for strengthening the communication between different parties, provide funding, grant loans and tax reductions/benefits, and refine the industry planning and guidance.

Secondly, together with InsurTech eco-system, it is necessary to build a communication and collaboration platform, to learn from the "regulatory sandbox system" and reserve laboratory space for testing potential innovations. This can strengthen effective interactions between the industry and regulators, determine the direction of future development jointly, and encourage the use of new technology in the traditional insurance industry. While facilitating the relevant innovation with enterprises, it should also improve the transparency of policy, capital and enterprise information.

Thirdly, it important to improve data management, reinforce information security, and protect network/ information security and privacy.

Fourthly, it is useful to organize demonstrations (or illustrations) of InsurTech applications, carry out the pilot/experimental work in the cities and regions with solid foundation of technology infrastructure and insurance market, form a group of outstanding illustrative projects, as well as accumulate related experience.

Fifthly, it is helpful to build a system of training InsurTech talents, strengthen the integration between research and production, encourage and support the establishment of courses related to insurance technology in colleges and universities, and cultivate cross-specialty (or multi-discipline) talents, as well as to provide funding to promote specific research, R&D and the establishment of professional training institutions.

Finally, international exchanges and global collaborations should be emphasised. It is useful to learn and value the policy, strategic planning and supervisory tools of other countries and regions. Furthermore, enterprises should be encouraged to be "open-minded" to see the world more widely and participate actively in the development of emerging technologies and industry standards.

一、概述

（一）保险科技发展背景

1. 保险科技（Insurtech）与金融科技（Fintech）

金融科技（Fintech）泛指科技和金融业技术变革对金融行业的重新塑造。Fintech最早冲击的金融行业是银行业，2008年金融危机以后，美国的银行业相对于保险业而言遭受到了更为严苛的监管，他们被迫回到银行主营业务，许多由原来大金融机构所主导的金融科技手段不得不分离出来，给创业者和科技公司提供了巨大的市场。由原来金融机构所主导的financial technology逐步演变成由科技公司、初创企业等主导的Fintech行业。

在保险科技没有形成一定规模之前，对于保险科技的讨论一直在金融科技框架之内。直到最近，保险科技逐步发展，针对保险公司经营管理和保险业务创新的企业逐步增加，风险投资相继进入，保险科技所获得的资金投入逐年递增，保险科技和银行科技所获得的资金差距逐步缩小，保险科技逐步受到市场的关注。国外开始出现Insurtech一词代表保险科技，并且从Fintech的相关讨论中单独剥离开来。

2. 保险科技在金融科技中的地位

2015年6月，全球知名智库世界经济论坛（World Economic Forum, WEF）发布了一份建立在由197位来自全球重要学界、业界与政府领导及创新领袖共同研究的长达178页的专项报告《金融服务业的未来——破坏性创造如何重塑金融服务业结构、供应及消费》，指出科技发展将全面冲击银行、证券和保险等传统金融业，但是长期而言对保险业的冲击将是最大的。

（二）保险科技（Insurtech）的内涵

1. 保险科技（Insurtech）定义

保险科技（Insurtech）泛指围绕着保险行业所涉及的相关新技术和现代科技。因此，保险科技的范围相当广，它并非针对保险公司，也涵盖了许多初创企业、科技公司和其他行业龙头企业结合自身优势所展开的类保险业务。保险科技广泛运用于保险产品创新、保险营销和保险公司内部管

二、中国保险科技发展生态

（一）保险市场发展潜力

1. 发展趋势

伴随我国经济的快速发展，保险业在近年也取得了长足的发展。中国保监会数据统计显示，截至2016年底我国保险业总资产规模达到15.12万亿元，其中寿险公司总资产规模达12.44万亿元，产险公司总资产规模达2.37万亿元，再保险公司总资产规模达2761亿元，保险业总资产规模近十年复合增长速度达24%。

从流量收入角度分析，2016年，寿险业务原保险保费收入17442.22亿元，较去年同比增长31.72%；产险业务原保险保费收入8724.50亿元，较去年同比增长9.12%；健康险业务原保险保费收入4042.50亿元，较去年同比增长61.71%；意外险业务原保险保费收入749.89亿元，同比增长17.99%，财产、人寿险公司总体保费收入十年复合增长速度也达到20%之高。

中国已经成为保险大国之一。根据2015年的数据表明，中国保险市场已经成为仅次于美国和日本的世界第三大保险市场，保费收入在全球保险市场的占比达到8.5%。其中，寿险业务保费收入为全球第四，在全球市场中占比达8.3%；非寿险业务保费收入为全球第二，市场规模占全球的8.7%。

2. 发展潜力

尽管中国已经成为世界保险大国，但是与保险强国之间仍有较大差距。以保险深度与保险密度为标准对中国保险市场进行考察，中国保险渗透率还处于低点，保险行业在国民经济中的影响力还有所欠缺：中国保险密度在2006–2015年的十年间，由431.3元/人增长至1766.5元/人，同期保险密度由2.8%提升至3.56%。不可忽视的是中国保险业在渗透度与居民参与度上显著落后于发达国家的事实：中国2015年人均寿险保费仅为153美元，这一数字在美国、日本、台湾依次为1719美元、2717美元、3397美元。中国2015年人均非寿险保费仅为128美元，这一数字在美国、日本、台湾依次为2377美元、837美元和698美元。与保险强国之间的巨大差距，也从另一个侧面说明

三、保险科技与运用

(一)区块链技术

1. 技术原理

现有的区块链工作原理总体包括六个步骤:第一步是电子信息的建立(比如交易的细节),第二步为加密,将数据进行加密式签名以后传送到分布式节点,第三步为确认交易,第四步为广播,将交易信息在整个网络系统内进行实时广播,第五步将包含交易信息的区块添加到所有分布式账本中,最后一步是网络复制已验证交易的记录。在这个工作过程中,区块是按照时间先后顺序生成的,区块与区块之间通过链的形式组织起来,旧的交易被记录在前一个区块中,而新的交易活动将被记录在后一个新的区块中,这个特点保证了数据库的完整性。在绝大多数情况下,当交易被确认、广播并添加到新的区块中,那么该区块的数据将无法被更改或删除。无法篡改数据的特点保证了数据库的严谨性。

区块链的技术原理决定了其具有去中心化、开放性、透明性、自治性、数据不可篡改性和匿名性六大特征。去中心化是指区块链技术运用分布式核算与存储,任意节点的权利和义务都是相等的,使得传统业务中心的作用不再重要。开放性是指采用公钥和私钥的设置,除了交易主体的私有信息被加密以外,所有人都可以通过公开的接口查询区块链数据和开发相关运用,系统信息公开透明。除开放性所具备的透明度以外,区块链网络将所有的交易账本实时广播、实时将交易记录分发到每个客户端中,所有人都能获悉交易内容。区块链的自治性表现为代码即法律,通过“脚本”的引入实现无需人为干预的自动执行程序;采用基于协商一致的规范和协议使整个系统中的所有节点能够在信任的环境自由安全的交换数据。一旦数据经过确认、广播并添加到区块链,该数据将被永久地储存在区块中;而且区块链固有的时间戳功能可以记录创建时间;信息的改动需要控制住系统超过51%的节点,这在开放系统下难度将非常大。此外,区块链用户尽管能够获悉其他人的交易内容,但对非属于自己的交易记录无法了解交易者的真实身份;同时保证每个人只能对自己的财产进行修改。

四、保险科技市场发展

（一）创新渠道

科技在保险行业的运用，最终将落实到具体的行业中。从目前保险科技创新的不同业态看，创新渠道主要发生在四个环节：保险产品设计、保险营销、企业运营和信息资讯。

保险产品设计是指保险公司针对客户需求提供相关的产品，这是市场存在的前提条件。保险营销是指在存在相关的保险产品之后，保险公司通过线上销售平台、营销员、银行保险等不同的渠道对产品进行销售，从而获得相应的保费收入。第三个环节为企业运营，当保险公司销售产品以后，在监管框架下必须对产品计提责任准备金、优化公司内部管理流程、对可能产生的理赔报案进行保险赔付，这一环节便是保险公司的企业运营环节。此外，保险运营主体还必须进行相关的信息披露，普及和提高民众的风险意识，对保险行业进行新闻报道和舆论监督等等。下文将结合细分领域的创新和相关的市场案例进行针对性的分析。

（二）产品创新

1. 细分领域

目前，大量的保险科技运用集中在产品创新领域。这些产品创新来自车险、企财险、责任险健康/旅游保险、寿险/家财险、物品险和再保险等不同领域，由此产生了车联网、大数据、物联网、基因检测等多项技术和保险产品的结合体。表9介绍了相关细分领域及其业态形式。

表 9　产品创新细分领域及相关业态

细分领域	相关业态
车险	通过信息数据处理技术按里程和驾驶行为来定价车险保费的产品。
企财险/责任险	为大公司、创业公司和自由职业者们提供商业险的解决方案，例如创业者和自由职业者的相关保险计划、大企业保险如责任保险、工人补偿保险等产品。
健康/旅游保险	为个人或者公司提供健康险和出行险的产品，包括可根据确切需求定制的健康保险计划，以及根据所在地进行调整的旅游保险。
寿险/家财险	提供寿险、家庭财产保险、伤亡险等产品，也包括残疾、婚姻保险。
物品险	为消费者采购的物品提供保险和担保，包括高科技3C产品和珠宝等。
再保险	为保险公司提供保险，来帮助对冲风险，降低支出成本，减少财务波动。

五、国际保险科技监管

（一）中国

李克强总理在在第十二届全国人民代表大会第三次会议上做了政府工作报告，报告中指出要“制定‘互联网+’的行动计划，推动移动互联网、云计算、大数据、物联网等与现代制造业结合，促进互联网金融、互联网医疗、互联网教育等新生态发展”，从政府层面、监管层面推动了互联网服务应用的加快实现，为云计算与保险的结合提供了有力的保证。

中国政府已经充分认识到了金融科技/保险科技的重要性。政府在促进金融科技平台、产品与服务的创新；鼓励金融机构与互联网公司的合作；通过促进风险投资、中小型企业公开上市来丰富金融科技企业的融资渠道；统一金融科技企业的行政审批；为金融科技/保险科技初创企业和金融科技创新企业提供赋税优惠；鼓励信贷信息建设的发展，为金融科技/保险科技提供支持服务系统等领域做出了积极的尝试。然而，随着过去逐渐增多的P2P借贷平台的欺诈或者问题的事件报道，金融监管部门已经着手准备相关监管规则的讨论与制定，加强对互联网借贷、互联网支付和互联网保险等金融科技/保险科技的监督与管理；同时加强对问题企业的查处，进一步保障保险消费者的合法权益。

尽管金融科技/保险科技得到了金融监管部门的强烈支持，然而由于许多创新目前并不在传统金融监管的范围内，因此保险科技企业创新仍然具有一定的不确定性。监管部门、创新主体对保险科技创新所涉及的潜在风险都比较谨慎。未来这一领域的具体监管还存在巨大的发展空间。

（二）中国香港

香港特区政府非常重视保险科技的发展。香港保险业的保险监管部门——香港保险业监理处专门成立了金融科技联络小组，以加强监管部门和香港从事金融科技发展和应用的人士间的沟通，帮助金融科技业界了解相关的保险监管制度，并发挥平台作用，让保险科技相关生态主体进行信息和项目的充分交流[1]。香港特区政府采用以下几种方式来鼓励金融科技/保险科技创新：

1. 参阅中华人民共和国香港特别行政区政府保险业监理处网站：http://www.oci.gov.hk/。

六、中国保险科技发展建议

保险科技目前在全球范围内快速发展，区块链、物联网、大数据、云计算、人工智能等数字技术被广泛应用在保险行业，包括保险产品创新、产品营销、保险公司经营管理和风险控制等领域，通过技术手段提升各生态主体的价值，旨在克服传统保险业的痛点，改良保险生态环境。在可以预见的时间内，保险科技在行业的应用有望大规模展开，通过技术的运用来推动保险业创新，而这种创新很有可能是颠覆性的。随着技术的不断进步，技术体系和产业格局也将逐步形成，但与此同时，潜在的风险也随之而来。这就要求我们对保险科技尽快布局，加强战略规划和顶层设计，制定相关的发展政策与法规，形成健康的发展环境，并整合利用各生态主体资源，加快我国保险科技的应用和发展，培育形成具有全球竞争力的保险科技产业。课题组提出以下建议，供各级政府主管部门、保险机构、科技企业等相关主体参考。

（一）制定保险科技发展政策与法规，构建适度宽松的发展环境

保险科技在全球范围内得到了快速发展，政府在其中发挥了不可替代的重要作用。基于我们对联合国、国际货币基金组织等国际组织对保险科技发展的政策走向的了解，以及对美国、欧盟、英国、新加坡、香港等国家和地区保险科技发展情况和政策措施的研究，建议各级政府和相关主管部门，借鉴发达国家和地区的先进做法，结合我国保险科技应用和发展现状，及时出台保险科技相关的发展扶持政策和相关法律法规，加强保险科技的规划和引导，打造适度宽松的发展环境，推动保险科技健康稳定、安全快速、可持续发展。

建议政府相关部委联合设立保险科技专项办公室，整合保险科技相关生态主体，帮助各方主体在框架内进行有效沟通、资源整合，建立良好的市场秩序；建议政府找准自身定位，放宽市场准入标准，加强事中事后监管，放管结合，营造有利于保险科技健康发展的环境；建议可以通过设置专项政府财政基金，降低银行贷款门槛，吸引社会资本和风险投资的投入等手段对保险科技相关的中小微、初创企业提供资金支持，并在税收方面给予优惠。

（二）联合保险科技生态主体，建设沟通合作平台

建议保险机构、消费者用户、初创科技企业、行业巨头、金融投资机构、政府监管机构等各方保

附录 调研企业名单*

名称	简称	公司网址
23andMe, Inc.	23andMe	www.23andme.com
ADT美国报警技术公司		www.adt.com
Airware		www.airware.com
American Family Insurance		www.amfam.com
Apache Hadoop		hadoop.apache.org
BizInsure		www.bizinsure.com
BRAVEday		braveday.co.nz
British Association of Removers	BAR	bar.co.uk
Buzzmove		www.buzzmove.com
Cape Analytics		capeanalytics.com
Clark		www.clark.de/de
Climate Corporation		www.climate.com
Cocoon		cocoon.life
CoverWallet		www.coverwallet.com
CXA Group		www.cxagroup.com
Discovery		www.discovery.co.za
EasyMile		www.easymile.com
Finanzchef24		www.finanzchef24.de
Friendsurance		www.friendsurance.com
Great Eastern Life Assurance		www.lifeisgreat.com.sg
Guidewire Insurance Platform		www.guidewire.com
Illumina		www.illumina.com
Insurance Australia Group Limited	IAG	www.iag.co.nz
Insure the Box		www.insurethebox.com
Knip		www.knip.de
LeaseLock		leaselock.com
Lemonade		www.lemonade.com
MAAF		www.maaf.fr
Metromile		www.metromile.com
Microsoft Azure		azure.microsoft.com
Misfit		misfit.com
MSIG Insurance		www.msig.com.sg
Nest		nest.com
Openbay		www.openbay.com
Oscar Health		www.hioscar.com
Peak Re		www.peak-re.com
Salesforce		www.salesforce.com
Schutzklick		www.schutzklick.de

* 本报告撰写过程中调研和引用了相关企业的经验或者案例，特此鸣谢。

名称	简称	公司网址
Sigfox		www.sigfox.com/en
State Farm		www.statefarm.com
STATISTICAL ANALYSIS SYSTEM	赛仕软件(SAS)	www.sas.com
Student Loan Genius		studentloangenius.com
Trov		www.trov.com
Venture Scanner		www.venturescanner.com
Vision Service Plan(VSP)		www.vsp.com
Zendrive		www.zendrive.com
Zenefits		www.zenefits.com
ZenPayroll(现更名Gusto)		gusto.com
阿里巴巴网络技术有限公司	阿里集团	www.alibabagroup.com
百安互联网保险公司	百安保险	筹备中
百年人寿保险股份有限公司	百年人寿	www.aeonlife.com.cn
北京百度网讯科技有限公司	百度	www.baidu.com
北京比邻共赢信息技术有限公司	数贝荷包	www.belink.com
北京大特保险经纪有限公司	大特保(更名大特e保)	www.datebao.com
北京京东世纪贸易有限公司		www.jd.com
北京诺禾致源科技股份有限公司	NovoGene(诺禾致源)	www.novogene.com
北京全维基生物科技有限公司(360°基因)	360基因	www.360jiyin.com
北京燕梳新青年信息科技有限公司	慧保天下	https://465408.kuaizhan.com/
博奥颐和健康科学技术(北京)有限公司	博奥颐和	www.bioeh.com
德国安联保险集团(Allianz)	德国安联	www.allianz.com
德国电信股份公司(Deutsche Telekom AG)	德意志电信	www.telekom.com
德国通用再保险股份有限公司(Gen Re)		www.genre.com
鼎宏汽车保险销售股份有限公司	鼎宏保险	www.dhis.com.cn
东京海上日动火灾保险有限公司Tokio Marine		www.tokiomarine.com
丰亚保险(Direct Asia)		www.directasia.com
高瓴资本管理有限公司	高瓴资本	www.hillhousecap.com
谷歌公司(Google)	谷歌(Google)	www.google.com
光大永明人寿保险有限公司	光大永明人寿	www.sunlife-everbright.com
广东盛世华诚保险销售股份有限公司	盛世华诚	www.ins1515.com
国际商业机器公司(IBM)		www.ibm.com
和泰人寿保险股份有限公司	和泰人寿	www.he-tailife.com
华大基因Complete Genomics		www.completegenomics.com
华凯保险销售股份有限公司	华凯保险	www.hkfin.com
京东互联网财产保险公司		筹备中
精皮士生物科技有限公司	精皮士	www.geeppies.com
律商联讯集团(Lexis Nexis)		www.lexisnexis.com
麦肯锡咨询公司(McKinsey & Company)	麦肯锡	www.mckinsey.com
美国国际集团		www.insurethebox.com

名称	简称	公司网址
(American International Group)	AIG	www.aig.com
美国好事达保险公司(Allstate)		www.allstate.com
美国前进车险公司(Progressive)		www.progressive.com
美国丘博保险集团公司(Chubb Group)		www.thechubbgroup.com
美国州立农业保险公司(State Farm)		statefarm.com
慕尼黑再保险公司(Munich Re)		www.munichre.com
耐克公司(Nike)		www.nike.com
平安科技(深圳)有限公司	平安科技	tech.pingan.com
全民小保镖		bao.data88.cn
日本富国保险公司(Fukoku Mutual Life Insurance)	www.fukoku-life.co.jp/english/	www.novogene.com
上海保橙网络科技有限公司	ok车险平台	www.okchexian.com
上海汇保网络有限公司	人人保险	www.renrenbx.com
上海交通大学医学院附属瑞金医院	瑞金医院	www.rjh.com.cn
上海最会保网络科技有限公司	最惠保	www.zuihuibao.com
深圳市腾讯计算机系统有限公司	腾讯	www.tencent.com
盛世大联保险代理股份有限公司	盛世大联	www.auto1768.com
苏黎世保险公司(Zurich)		www.zurich.com
太平电子商务有限公司	太平电商	baoxian.cntaiping.com
太平人寿保险有限公司	太平人寿	life.cntaiping.com
太平洋保险在线服务科技有限公司	太平洋在线	www.ecpic.com.cn/zxfw/
泰康人寿保险股份有限公司	泰康保险	www.taikang.com
泰康在线	泰康在线	www.tk.cn
特斯拉公司(Tesla Inc.)		www.tesla.com
同昌保险经纪股份有限公司	同昌保险	tcicb.com
万舜保险股份有限公司	万舜股份	www.wshbd.com
威今基因科技股份有限公司	wegene	www.wegene.com
沃尔沃集团(volvo)		www.volvogroup.com
无锡汉和航空技术有限公司		www.hanhe-aviation.com
亚马逊 Amazon Web Service		aws.amazon.com
阳光保险集团股份有限公司	阳光保险	www.sinosig.com
英国保诚集团(Prudential)		www.prudential.co.uk
英国英杰华集团 Aviva		www.aviva.co.uk
永安财产保险股份有限公司	永安保险	www.yaic.com.cn
优步(Uber)		www.uber.com.cn
浙江蚂蚁小微金融服务集团股份有限公司	蚂蚁金服	www.antfin.com
中国平安保险(集团)股份有限公司	平安保险	www.pingan.com
中国平安人寿保险股份有限公司	平安人寿	e.pingan.com
中国人寿保险股份有限公司	中国人寿	www.chinalife.com.cn
中国人寿电子商务公司		www.chinalife.com.cn/publish/zhuzhan/1348/index.html
中国太平保险有限公司的简称	太平保险	www.cntaiping.com
中国太平洋保险(集团)股份有限公司	太平洋保险	www.cpic.com.cn

名称	简称	公司网址
中国太平洋财产保险股份有限公司	太平洋产险	property.cpic.com.cn
中国太平洋人寿保险股份有限公司	太保寿险	life.cpic.com.cn
中国铁路总公司 （中国铁路客服中心12306铁路票务查询系统）	12306	www.12306.cn
中衡保险公估股份有限公司官网	中衡股份	www.zhbx.net
中山大学达安基因股份有限公司	达安集团	www.daangene.com
众安信息技术服务有限公司	众安科技	www.zhongan.io
众安在线财产保险股份有限公司	众安保险	www.zhongan.com