Institute of Insurance Economics

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The Impact of Digitalization on the Insurance Value Chain and the Insurability of Risks

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Industry commentators believe that the digitalization will fundamentally change the insurance sector

Motivation of our study

Industry studies (Examples)

Given this transformation and the magnitude of the interest, it seems astonishing that the academic discussion on digitalization has been virtually nonexistent.

We provide insurance practitioners and academics a high-level overview on the main research topics and encourage future work

Contribution and research approach

Literature review (starting point)

- Structured and standardized search and identification process
- We review academic literature from 2000-2017 (database of 81 papers)

Appendix A: Dataset of papers and industry studies

Table A: Dataset of papers and industry studies

ID	Title	Author(s)	Year	Journal/Book	Volume	Issue/No.	Pages	Country
Computational methods								
1	A Review of Computational Intelligence Algorithms in Insurance Applications.	Sancho Salcedo-Sanz Lucas Cuadra Portilla-Figueras, A Silvia Jiménez-Fernández Enrique Alexandre	2013	Statistical and Soft Computing Approaches in Insurance Problems				no specific
Customer survey								
2	Aggregation metrics: Consumer approaches to insurance comparison sites in Europe	unknown	2013	Press release (Finaccord)				Europe
3	Capturing hearts, minds and market share: How connected insurers are improving customer retention	Christian Bieck Lee-Han Tjioe	2015	Industry study (IBM)				no specific
4	Die Customer Journey in einer multioptionalen Welt	Niklas Barwitz Peter Maas Dennis Block Christoph Nützenadel	2016	Industry study (I.VW-HSG and Synpulse)				Germany, Switzerland, Austria
5	ROPO Studie für Versicherungsprodukte in Deutschland – Kernergebnisse	unknown	2016	Industry study (Zurich, GfK and Google)				Germany
6	Trust, transparency and technology: European customers' perspectives on insurance and innovation	Peter Maas Albert Graf Christian Bieck	2008	Industry study (I.VW-HSG and IBM)				Denmark, the Netherlands, France, UK, Germany, Switzerland
7	Winning share and customer loyalty in auto insurance	Tanguy Caitlin Devin McGranahan Sharmila Ray	2013	Industry study (McKinsey & Company)				US
Insurability								
8	Digitales Monitoring: Fluch oder Segen?	Hato Schmeiser Lukas Reichel	2016	*I.VW HSG Trendmonitor*		3	3-5	Germany, Switzerland, Austria
9	Insurability in microinsurance markets: An analysis of problems and potential solutions	Christian Biener Martin Eling	2012	*The Geneva Papers on Risk and Insurance*	37	1	77-107	no specific
10	Insurability of cyber risk: An empirical analysis	Christian Biener Martin Eling Jan-Hendrik Wirfs	2015	*The Geneva Papers on Risk and Insurance*	40	1	131-158	no specific

Core reseach questions

1. What is digitalization and which technologies will influence the industry?
2. What is the impact of these technologies on the value chain?
3. Will the insurance industry lose parts of its value chain to other industries?
4. Can insurtechs significantly disrupt the industry?
5. How does the insurability of risks change?
6. What should the insurance industry do in response to digitalization?
7. What future research is needed?

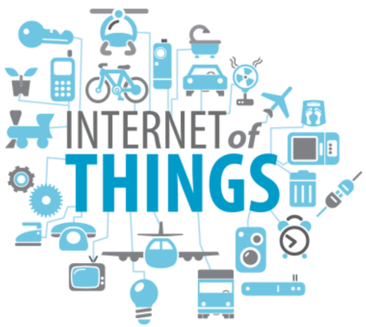
We identify three broad categories of change caused by technology: customer interaction, process automatization and product design

I What is digitalization and which technologies will influence the industry?

! **Definition:** Digitalization is the integration of the analogue and digital world with new technologies that enhance customer interaction, data availability, and business processes.

Technologies for…

Data generation and analysis



Data storage

BLOCKCHAIN

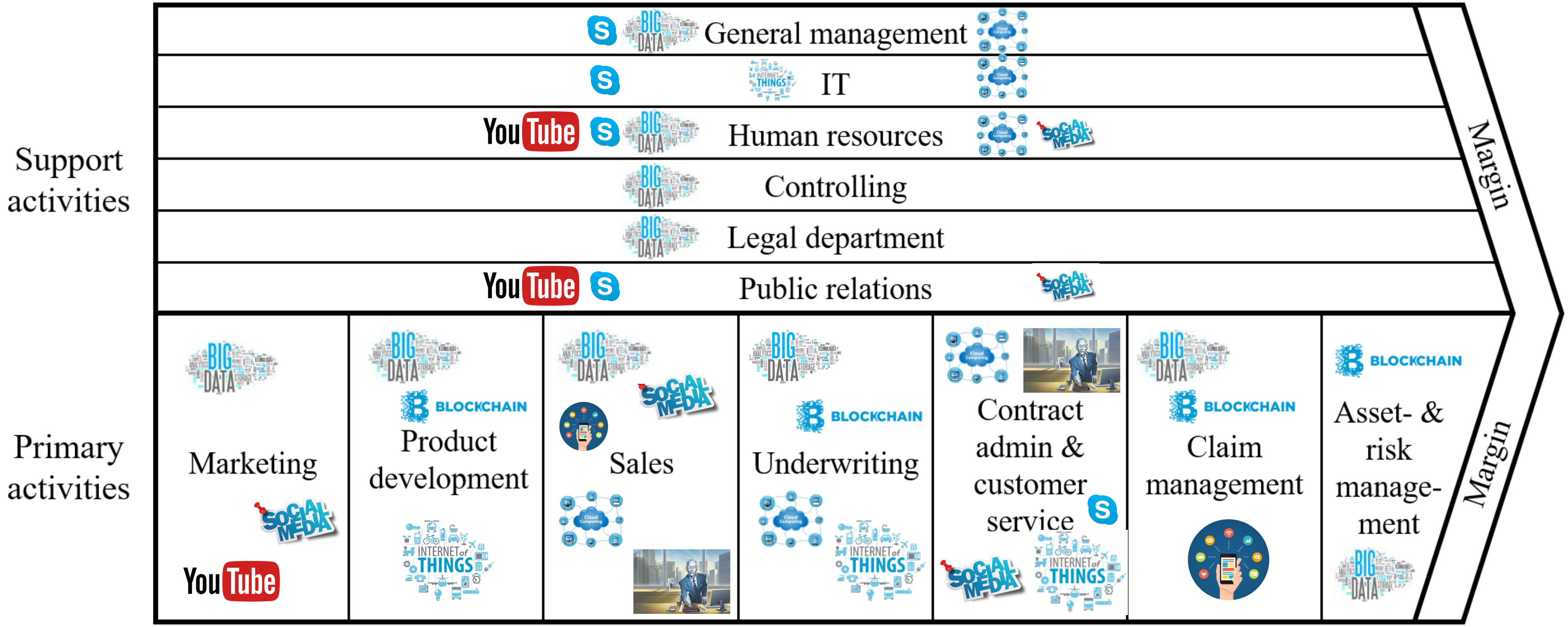
Communication and sales

YouTube

Every part of the value chain is influenced to some extent by the new technologies – often by improving the process efficiency

2 What is the impact of these technologies on the value chain?

Insurance-specific value chain (based on Porter, 1985)



The risk of disruption from other industries seems rather low at the moment, but this might change when new technologies emerge

3 Will the insurance industry lose parts of its value chain to other industries?

Examples from other industries

- **What could stop other industries?**
  - Maybe the profit margin is not high enough yet
  - Regulation
  - Investment in the whole insurance infrastructure

It seems rather unlikely that insurtechs will cause a major change or disruption to the insurance industry

4 Can insurtechs significantly disrupt the industry?

- Three categories of insurtechs:

Customer experience

GetSafe

oscar

BACKBASE

Business processes

CHECK24

GETSURANCE

CLAIMABLE

Unfallfuchs

New products

trōv

Lemonade

safe share

- **Four arguments against disruption by insurtechs**:
  1. Can be easily copied
  2. Can be simply acquired them
  3. Insurtechs focus more on cooperation
  4. Regulation, unsolved legal questions and lack of expertise could rise further issues

New technologies might change loss frequency and severity and also impact asymmetric information

5 How does the insurability of risks change?

Insurability criteria

- We use Berliner's (1982) insurability criteria

Insurability criteria		
Actuarial	(1)	Randomness of loss occurrence
	(2)	Maximum possible loss
	(3)	Average loss per event
	(4)	Loss exposure
	(5)	Information asymmetry
Market	(6)	Insurance premium
	(7)	Cover limits
Society	(8)	Public policy
	(9)	Legal restrictions

Some results of our analysis

1) Randomness of loss occurrence
   - Smaller risk pools can be created, which will lead to a more distinguished separation of risks

4) Loss exposure
   - Loss probability might be reduced through technical assistance systems or internet of things

5) Information asymmetry
   - Can become smaller or larger (Willingness to share, regulation)

8) Public policy
   - Ethical questions (Gen tests), effect on solidarity (willingness of good risk to subsidize bad risks might be reduced)

9) Legal restrictions
   - Data protection

Several questions arise which should be answered by the insurance industry

6 What should the insurance industry do in response to digitalization?

- Insurers should ask themselves if they have to do major part of the value creation by themselves
- Insurers should follow the technology development closely
- Insurers have to define the future work environment
- Several questions have to be answered:
  - Regulation of insurtechs?
  - Which data should insurance companies be allowed to use?
  - Where are the priorities of digitalization (customer, process, product)?
  - How to organize the integration of new technology?
  - Do investments (e.g., for IT) outweigh the benefits?

Digitalization and big data offer enormous potential for empirical research

7 What future research is needed? - Examples

- Telematics and adverse selection / moral hazard
- Usage of big data techniques, for example for pricing telematic contracts
- Interaction between new technologies and privacy and data protection laws
- Improvement of cyber risk insurance
- Liability insurance in the context of self-driving cars
- Change of solidarity through new technologies

Thank you for your attention! Now, let us discuss!