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Insurance 4.0
Benefits and Challenges of Digital Transformation

Bernardo Nicoletti

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Foreword

I have known Bernardo Nicoletti since a long time: we have been collaborating in many challenges and countries around the world and from many positions. He already wrote some years ago another inspiring book: Digital Insurance, that I consider a prequel to this one, where he now tackles a new, yet connected, topic, "How to push and support digital transformation in insurance companies."

It was about time to have such a book. Indeed the revolution of industry 4.0 goes back to 2012, while in the meantime, many financial institutions have almost continued unchanged, almost unaware of what was happening around them. New companies and business models have been started, and other have failed, sometimes in a dramatic way. The digital world has disrupted entire sectors, such as newspapers, media recording, commerce, manufacturing, and others. It is now impacting heavily also on financial services.

Consequently, the concept of "digital transformation" is on the agenda of many CEOs and Board rooms. But apart from the buzzword, it is often not clear what it really means; financial services have often interpreted "digital transformation" only as a way to provide access to some products via digital channels, online or mobile. Digital transformation is much more than that: it is a change in the business models of the company. It is essentially putting the customer at the center of attention and using digital platforms to build a new business and operating model around

that. Such a transformation involves all the dimensions of the business such as products, processes, people, partners, and platforms.

In the last few years, prophets started to make statements such as: "banking is necessary, but banks are not." This approach has spurred a certain number of studies to understand what digital transformation meant for banks. In the meantime, the other cornerstone of financial services, insurance has not changed much. The mantra for some was that insurance does not have many contact points with customers. Hence digital transformation was not that essential.

Bernardo claims that there is a need for a Copernican revolution in insurance too. It is necessary to put at the center of attention the customers and their needs. This approach is what this book describes and its relevance is that not only it tells you what to do but also how to do it. Bernardo applies the Galileo method, which has three steps, intuition, demonstration, and experiment, and this is the method applied in this book.

There are also certain exciting intuitions on how "insurance" should change, like the evolution from "products" to "services", and the fundamental importance of "platforms" and "ecosystem". Simultaneously, the book goes into detail on what to do with the support of methodologies, old or new, which Bernardo describes in detail. Finally, the text is full of real business cases where the digital transformation has been experimented and implemented.

I am happy to see that Bernardo has also considered the company I work for in some of these business cases. Indeed I believe that Allianz has had the intuition to implement what another guru of financial services, Chris Skinner, has written in his books: companies like Banks need in their board and executives not only bankers but persons with deep experience of technologies, and this applies also to Insurances.

The book stresses also another important aspect: the increasing importance for insurance companies of data and their management. The crisis caused by COVID-19 has only underscored this point and given us a new sense of urgency, but also shown us that we can re-engineer all function in a much more digital and agile way then we thought.

To date, insurers must use all the tools to grow, protect themselves, and better plan the future. The most effective way to do this is through the strategic use of data. Data is essential to understand the customer and protect the company from exposure and mitigate the associated risks.

In times of crisis, the mutuality role of insurance increases in importance. Unfortunately, in some cases also the probability of fraudulent transactions, dictated by despair, is higher.

Analysis tools will play an essential role in this recovery, providing insurers with all the information they need to limit their exposure, promote new offers, and enrich their services.

It is fascinating to go through the various chapters of this book because the insurance companies that have started to implement the digital transformation state that their work is only the beginning of what is necessary. There is a need for a continuous digital transformation.

Because the question for insurance companies is not "if" to do it, it is "when" to do it; the time is now, and the success will be with the hard work pioneers.

Munich, Germany

Fabio De Ferrari
Chief Operation Officer bei Allianz
Deutschland AG

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Abbreviations

3P	Planet, Persons, Profit
ADAS	Advanced Driver Assistance Systems
AGV	Automated Guided Vehicle
AI	Artificial Intelligence
AK	Awareness and Knowledge
AMA	American Marketing Association
AMC	Annual Maintenance Contract
APF	Attitude Towards Innovation
API	Application Programming Interface(s)
AR	Augmented Reality
ASA	Associazione Svizzera d'Assicurazioni
B2B	Business-to-Business
B2C	Business-to-Consumer
B3i	Blockchain Insurance Industry Initiative
BAU	Business as Usual
BC	Behavioral Control and Before Christ
BC	Business Continuity
BCG	Boston Consulting Group
BDAQ	Big Data Analytics Quality
BI	Business Intelligence or Business Interruption
BPaaS	**B**usiness Process as a Service
BPI	Business Process Intelligence (BPI)
BPO	Business Process Outsourcing or Business Process Optimization
CAGR	Compounded Annual Growth Rate
CBR	Case-Based Reasoning
CC	Cognitive Computing

CCPA	California Consumer Privacy Act
CDO	Chief Digital Officer
CISO	Chief Information Security Officer
CLM	Contract Lifecycle Management
CNC	Computer Numerical Control
CPM	Critical Path Method
CPM	Corporate Performance Management or Critical Path Method
CPS	Cyber-Physical System
CRM	Customer Relationship Management
CSP	Content Service Platform
DB	Data Base
DIP	Pre-contractual Information Document
DM	Data Management
DPI	Digital Performance Index
DR	Disaster Recovery
ECM	Enterprise Content Management
EDI	Electronic Data Interchange
EMEA	Europe, Middle East, and Africa
EMS	Small and Medium Enterprises
ERP	Enterprise Resource Planning
ESG	Environmental, Social and Governance
EU	European Union
EVI	Early Partner Involvement
FTE	Full-Time Equivalent
GAFAM	Google, Amazon, Facebook, Apple, and Microsoft
GBP	British Pound Sterling
GDPR	General Data Protection Regulation
HCI	Human–Computer Interaction
HR	Human Resources (Department)
IA	Integrated Analytics or Intelligent Automation
IaaS	Infrastructure as a Service
IBIP	Insurance-based Investment Product
IBNER	Incurred but not enough Reported
ICT	Information and Telecommunication Technology
IIoT	Industrial Internet of Things
ILS	Insurance-Linked Securities
IoE	Internet of Everything
IoP	Internet of Persons
IoS	Internet of Service
IoT	Internet of Things
IP	Internet Protocol
IRDA	Insurance Regulatory and Development Authority
ISO	International Standard Organization

IVASS	Istituto per la Vigilanza sulle Assicurazioni
IVR	Interactive Voice Response
KPI	Key Performance (or Process) Indicators
KYC	Know Your Customer
M&A	Merger and Acquisitions
MNO	Mobile Network Operator
MR	Mixed Reality
MSP	Multi-Sided Platforms
NFC	Near Field Communication
NIST	National Institute of Standards and Technology
NLP	Natural Language Processing
NPS	Net Promoter Score
NQ	Non-Quality
NRMA	National Roads and Motorists' Association
OBD	On-Board Diagnostics
ODA	Operational Data Analytics
OT	Operations Technology
P&C	Property and Casualty
P4	Predictive, Preventative, Personalized, Participatory
PaaS	Platform as a Service
PAYD	Pay-As-You-Drive
PBI	Process Business Intelligence
PCW	Price Comparison Websites
PEF	Perceived Economic Factor
PHYD	Pay-How-You-Drive
POG	Product Oversize Governance
PROU	Perceived Ease of Use
PT	Perceived Trust
PU	Perceived Usefulness
QR	Quick Response Code
R&D	Research and Development
RATER	Reliability, Assurance, Tangibles, Empathy, and Responsiveness
RBNS	Reported but not Settled
RE	Real Estate or Reputation
RFID	Radio-Frequency Identification
ROPO	Research Online, Purchase Offline
RPA	Robotic Process Automation
SaaS	Software as a Service
SARS	Severe Acute Respiratory Syndrome
SIM	Subscriber Identity Module
SLA	Service Level Agreement
SMS	Short Message Service
SN	Shared Nothing

SP	Social Pressures
STP	Straight Through Processing
SWOT	Strengths-Weaknesses-Opportunities-Threats
TAM	Technology Acceptance Model
TCM	Total Cost Management
TQM	Total Quality Management
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicles
UBI	Usage-Based Insurance
UK	The United Kingdom
ULIP	Unit-linked Insurance Plan
UMTS	Universal Mobile Telecommunications System
US or USA	United States of America
USD	United States Dollar
VCW	Value Comparison Website
VR	Virtual Reality
VUCA	Volatile, Unpredictable, Complex, and Ambiguous
WHO	World Health Organization
XML	Extended Messaging Language

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CHAPTER 1

Introduction

The global recession and the pandemic hit hard. It has impacted all organizations and functions. Figure 1.1 summarizes some of these challenges. Insurance has almost remained outside of the trend of digital transformations until now.[1] After the pandemic crisis, it is vital to develop and manage innovative strategies also in insurance.

Insurance companies have begun to innovate, create new business models, invest in emerging technologies, and partner with insurtech organizations, either financing or acquiring them.[2] Most of these innovations did not center on the concept of customer-centricity. Companies need to design and offer customers products and services relevant to new and old customers.

Unlike the new insurtech organizations, traditional companies have millions of customers and must build engagement and loyalty to retain and grow their customers. In Italy, in the past, only 14 percent of customers have bought policies online. The use of services such as

[1] Uusitalo, J. (2019). *Strategic insurance in the face of uncertainty*. Master's thesis, University of Jyväskylä, Finland.

[2] Generali. (2018, February 28). *Le assicurazioni "tutto connesso."* www.generali.com/it/info/discovering-generali/all/2018/A-fully-connected-insurance. Accessed 2 November 2019.

B. Nicoletti, *Insurance 4.0*, Palgrave Studies in Financial Services Technology, https://doi.org/10.1007/978-3-030-58426-9_1

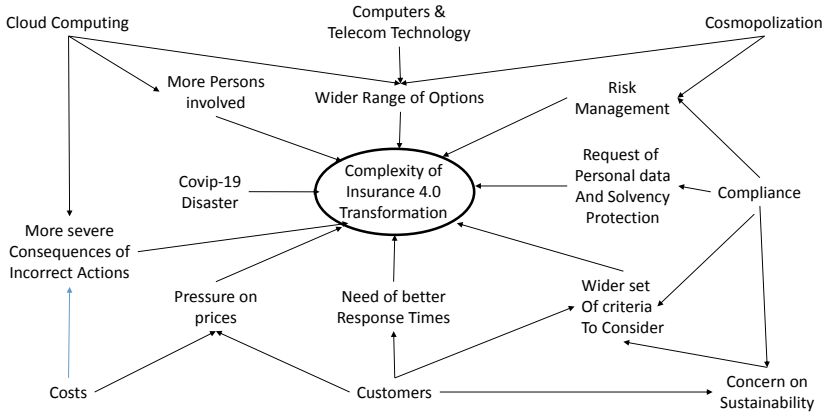

Fig. 1.1 Impact of transformation on insurance

micro-insurance or mobile claims management is only 2 percent.[3] The pandemic will bring a cultural transition to the customers. It is necessary to improve the proposals of insurance services also with the support of digital solutions.

Above all, it is critical to understand who are the insurance customers, and what their needs are, expressed or implicit.[4] Consultants Deloitte developed a survey called: "A demanding future - The four trends that define insurance in 2020." Through interviews with over 200 C-suite insurance managers, Deloitte identified and found some main trends throughout the EMEA area. They are the critical points for the future of insurance industry, or at least, for those companies that aim to continue growing.[5]

Deloitte says that the growth of the business for an insurance company will come from a change of approach. This approach must be transformed from merely protective to preventive and protective, with a range of new

[3] www.insuranceup.it/it/opinioni/deloitte-4-trend-per-le-assicurazioni-nel-2020/. Accessed 25 December 2019.

[4] Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Understanding customer expectations of service. *Sloan Management Review*, *32*(3), 39–48.

[5] www2.deloitte.com/content/dam/Deloitte/uk/Documents/financial-services/deloitte-uk-insurance-trends-2019.pdf. Accessed 25 December 2019.

services and products, new business models, and more considerable attention to prevention on respect to claim management. Customer needs, knowledge, and expectations have expanded exponentially over the past decade. Companies need to adapt to their customers' needs. In an age of immediacy, continuous changes, and overwhelming choices in which loyalty is no longer a certainty, the sector must extend beyond its main products and services if it wants to maintain its customer base. It must substantially innovate and change its approach.

In a highly competitive environment, current companies can no longer rely on organic growth or internal innovation. As a result, mergers and acquisitions, equity partnerships, and collaborations are essential. The winners are the companies able to launch and grow an ecosystem, also with alliances with innovative startups, teaming up with insurtech organizations, and consolidating with their competitors. Merger & Acquisitions (M&A) activity will focus on key markets and products. Access and use technologies that allow improvements within the sector will come, also through acquisitions or partnerships. These potential opportunities require a holistic view of innovation. It would include distribution, new products, underwriting capacity, or improvements in the claim settlement process. The ability to integrate the assets acquired will be fundamental to determine the success of this strategy.

The winners should invest in innovative platforms. They should rethink and revise their business model. A rapidly changing market and evolving industry will require an unprecedented ability to do business. Technological changes are essential. They are not enough. Knowing these changes and using them in the best way are very different things. Companies should use solutions such as analytics, blockchain, artificial intelligence, internet of things, and cloud computing to their benefit. Insurance companies must be able to use the right technology for the right purpose and in the right combination with a revision of their entire business model, and mainly of their processes.

Insurance companies are pure service providers that are highly data-founded. Digitization can influence companies.[6] Already, large parts of the insurance industry are robustly affected by digitization. In particular, the distribution is becoming heavily digitized. Digitization will also strengthen other parts of the value network of the insurance industry.

[6] Prognos, A. G. (2017). *Digitalisierung in der Versicherungswirtschaft*. Studie. Hg. v. vbw Vereinigung der Bayerischen Wirtschaft e.V. München, Germany.

The digital change in various areas of the insurance value network should be systematically applied, taking into account several theses.[7] The three main business areas to grow in the post-pandemic area seem to be: liability insurance, vehicle insurance, and private health insurance.

A broader "fourth industrial revolution" based on technologies, such as cloud computing, telematics, the internet of things (IoT), mobile phones, blockchain solution, artificial intelligence/cognitive computing, and predictive modeling, affects the entire insurance business model. These new solutions enable new ways of communicating, information sharing, and ensuring.[8] It is crucial to understand how new digital solutions can help overcome the so-called information asymmetry.[9] So far, as a rule, the policyholder can better assess his/her risks than the respective insurance companies. Thanks to automatic detection features (e.g., motion profiles for health insurance or the driving behavior in motor insurance), insurance companies can evaluate the individual risks and take them into account in pricing insurance. The information asymmetry could potentially reverse in favor of insurance companies. As a result, there would be more customized rates: Good risks could be cheaper. Bad risks will get more expensive or simply not insured.

Digitization will change the profit and loss account of the companies in two ways:

- lower costs;
- additional revenues through new business models.

Digitization can impact on pricing and competition. The real question is whether the digitization-driven changes in distribution channels, competition, and so on, maybe allowed under new regulations. The compliance framework should not restrict competition. Instead, the customer and data protection should be at the center of considerations.

There is a need for a new vision of insurance. This vision is called insurance 4.0 in this book. New solutions have generated researchers' interest

[7] Prognos, A. G. (2017). *Digitalisierung in der Versicherungswirtschaft*. Studie. Hg. v. vbw Vereinigung der Bayerischen Wirtschaft e.V. München, Germany.

[8] Schmidt, C. 2018. *Insurance in the Digital Age*. The Geneva Association. Zurich. Switzerland, 1–20.

[9] Blomqvist, Å. (1991). The doctor as a double agent: Information asymmetry, health insurance, and medical care. *Journal of Health Economics, 10*(4), 411–432.

in very different fields: computer and management science, organization theory, law, and economics. An integrated vision is missing. This book shows why and how insurance 4.0 can change in an integrated way the insurance industry. Insurance 4.0 is potentially the engine and starting point of the changes the customers increasingly want and ask for digital services and solution models.

According to Deloitte, companies are too optimistic about the insurance industry's progress in adopting and using technologies. As a matter of fact, I, insurance companies are lagging behind many other sectors. Companies are not fully aware of the large-scale technological disruption that is about to fall upon them. This disruption might be generated by technology giants who are already entering other highly regulated spaces, such as banking. They have an unprecedented capacity for analyzing customer data and information. This capacity allows them to create easy-to-understand, flexible, and customer-centric insurance models.

Insurance 4.0 requires a change in the relationship with the customers. The insurance company uses digital solutions to automate processes and offer services via various channels to reduce costs and prices of services and meet the changing needs of customers. It is critical to transforming insurance companies through process improvement and automation management. To analyze how to do this, a vital entry point is insurance 4.0. Insurance 4.0 is not only a component of the initiative industry 4.0.[10] It is much more. It is a new original vision of insurance that makes it more agile, integrated, responsive to the customers, while adding a value to the organization. Insurance 4.0 represents the set of solutions that can support managers at all stages of the insurance processes. Insurance 4.0 refers to an organization that uses the fundamental principles of adaptive systems and complexity science to achieve success.

This book explores the problems and solutions in how insurance can add more value to the customers, how it can manage relationships, improve processes, and better manage resources, both internally or of

[10] Lasi, H., Fettke, P., Kemper, H. G., Feld, T., & Hoffmann, M. (2014). Industry 4.0. *Business & Information Systems Engineering, 6*(4), 239–242.

the partners.[11] For analyzing these challenges, this book uses the business model canvas framework.[12] This framework is a powerful tool for the analysis of organizations and helps in modeling their strategies.

One of the principal objectives of the insurance 4.0 initiative is to implement agility. Agility is nowadays a much-used term in the management of organizations.[13] This development is essential. Agile management derives from lean management: a mantra of recent years. The need to be lean is not the goal that organizations must pursue. It is the way to be more agile and flexible. In other words, agility is the objective, while lean is a possible means to reach the goal.

The need for agility is a consequence of the turbulence of the current environment. Agility requires organizations that respond quickly to changes by adapting their configuration. Organizations can achieve agility by maintaining and modifying processes, products, and services to meet customers' needs. This objective is achieved by changing or at least improving, the business models. It requires to use in the best way the available resources within the ecosystem in which the organizations operate. Thanks to the agility, an organization can quickly adapt to the environment and market changes in effective, efficient, and economical ways.

Insurance 4.0 can provide support to the digital transformation of the organization. It aims to turn change into a habit of the organization's life. It has the objective to reduce or eliminate the organizational trauma that paralyzes many organizations that try to adapt to new markets, environments, technology, and solutions. Changes in the environment are perpetual. Insurance 4.0 can adjust and take advantage of emerging opportunities easily.

[11] This book uses the terms vendor or intermediary. It is replaced most of the times with "partners" as if the relationship fails, both the customer and the vendor/intermediary are damaged.

[12] Osterwalder, A., Pigneur, Y., Oliveira, M. A. Y., & Ferreira, J. J. P. (2011). Business model generation: A handbook for visionaries, game changers, and challengers. *African Journal of Business Management*, *5*(7), 22–30.

[13] Nicoletti, B. (2017). *Agile insurance. Volume II: Designing and implementing a digital transformation*. London, UK: Springer International Publishing. ISBN 978-3-319-61085-6.

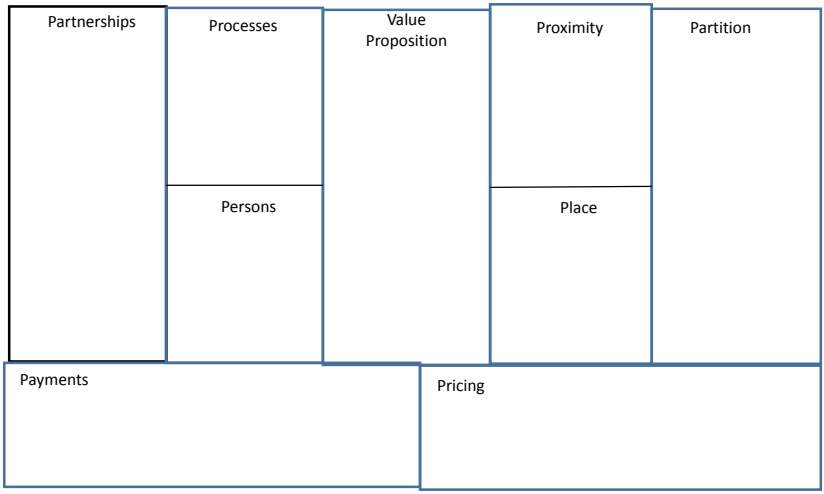

Fig. 1.2 Business model canvas

This book delves into these methods and techniques, treating the field of insurance 4.0 as an agile business model, involving all its components.[14] The organizations' transformation must cover all the components in the business model canvas, which this book indicates as the ten Ps (Fig. 1.2):

- Proposition of value;
- customer Proximity;
- market Partitions;
- Processes;
- Place or channels;
- resources and Platforms;
- Persons;
- Partnerships;

[14] Nicoletti, B. (2017). *Agile insurance. Volume II: Designing and implementing a digital transformation*. London, UK: Springer International Publishing. ISBN 978-3-319-61085-6. Nicoletti, B. (2017). *Agile insurance. Volume I: Adding value with lean processes*. London, UK: Springer International Publishing. ISBN 978-3-319-61082-5.