

# Artificial intelligence and insurance

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[special issue of *Digital Issues*, March 2018]

## **Abstract:**

Its use as a catchword should not keep us from seeing that artificial intelligence is attaining the stage of growth for an industrial and commercial rollout. AI is deeply changing many business processes as well as relations with customers and employees. How is the insurance industry to cope with these innovations? First of all, like other branches of the economy, it must assess the effects on its value chain. Secondly, it must focus on the management of risks — and thus the potential for new activities or things to be insured (as happens for any technological or industrial invention). Finally, for both the insurance industry and society, AI raises so many questions about responsibility and ethics that trying to dodge them would be as irresponsible as unrealistic.

## **Artificial intelligence an innovation that has already reached a venerable age**

Going back to the origins at Dartmouth College, NH, in the mid-1950s (McCARTHY *et al.* 1955) or to (a personal memory) the frantic activity in laboratories at the LSI-IRIT (Toulouse University, INRIA), MAIA (SANSONNET 1988) or LORE (CASEAU 1987) in Marcoussis (AUBERT & DIXNEUF 1991), the phrase “artificial intelligence” clearly refers to the hope for a conscious machine in the sense of the Turing test (TURING 1950). The value of this now overused phrase has been worn away.<sup>1</sup> Luc Ferry (2016), like others, has tried to propose newer definitions by distinguishing between “weak” and “strong” artificial intelligence. The first, mainly algorithmic, is obtained via computational power, which used to be scarce but is now abundant, whereas the latter is the genuine AI of the pioneers in this field. Despite its interest, this debate is not the topic of this article.

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<sup>1</sup> This article has been translated from French by Noal Mellott (Omaha Beach, France). The translation into English has, with the editor’s approval, completed a few bibliographical references.

Suffice it to say that technology now enables us to simulate, at least under certain circumstances, human work and behavior and to achieve a capacity for machine learning (a process whereby a machine learns owing to the input of data without any modification of its algorithms), if not deep learning (a variant of machine learning whereby the machine evolves and learns autonomously). This technology has now reached an industrial phase: robots (a word invented in 1922 by Karel Čapek, a Czech, to describe automats that would be built by industry to relieve people of thankless, repetitive tasks), chatbots (agents/devices with an interface for forms of conversation between a service and a user), IBM's Watson, etc.

## **The impact on the insurance industry's value chain**

The fine print on insurance contracts... How many times have we not heard customers complain, often rightly so, that such and such a point in the contracts they signed had not been explained to them or that they had not understood? The question of the advice provided to customers in the insurance industry has been raised and is not yet fully settled.

The platforms introduced during the 1980s for telephones, then for e-mail (during the 1990s), and then on the Internet (since 2000) are innovations that, it is claimed, improve customer services. Are our customers better served nowadays? The question of customer services also crops up in the insurance industry. It, too, has not yet been fully settled (LETRIBOT 2017).

Let us concede that the insurance business is complex. Insurance companies have not always put the necessary effort into explanations and simplification — especially not in Europe where risk-taking and the investment mentality are, if not taboo, much weaker than in Anglo-American lands. Despite what insurers say about being customer-centered, a gap still exists between their proposals and customers' expectations (expressed or not). Whether a necessity or an alibi, the insurance broker or agent has long been seen as the person who spans this gap, as the more or less neutral interpreter in between the impersonal insurance company and its anxious clients with their questions. The direct channel via the Internet can bring insurance companies and their clients closer; but it might also dehumanize relations. The relatively slow progress made in insurance can probably be set down to the lack of human assistance in a field that is still complex and abstruse for most people.

In this context, the invention of tools using “natural language” seems to offer an answer. Logically, these tools, ranging from the simplest chatbot to IBM's Watson, should (help) bridge the (semantic) gap separating insurance companies from clients. The results are promising... Unlike the never-ending menu options of the first interactive “voice servers”, these new tools are better accepted by customers owing not only to the quality and rapidity of the answers but also to their nearly human quality.

This progress also benefits insurance companies. Immediate, correct answers help lower the number of customer reminders to be sent out and help (to use the hallowed words) “recenter” work teams on tasks with more “added value”. But this is not the only way this technology optimizes the insurance industry’s value chain.

In insurance, information systems are usually old, and not very agile. Moreover, it is hard to overhaul them, not for reasons of technology or algorithms but because of the abundance and age of the data they manage. Some insurance contracts date back thirty, or even fifty, years. How many employees have to, day after day, juggle between systems to find and recopy information — an ungrateful, error-prone task? The robotization of these tasks and the automatic recognition of the contents of documents (even handwritten ones) are genuine factors for optimizing this industry’s value chain.

However neither the initial results of AI nor its future prospects should keep us from addressing essential questions about:

- customer-centered policies. What transparency for the offer of insurance products and services? And what quality of advice and service?
- about personnel management and employability in a digital world. What support for work teams so that they can actually perform tasks with more added value?

Let us come back to these questions shortly.

## **The impact on the management of risks in the insurance industry**

Midway between the optimization of the value chain and a better management of risks is “sophisticated pricing” (SANTONI & GOMEZ ALVADO 2007). The latter is somewhat of a Janus in modern insurance techniques. It helps us better understand risks and set the prices for them; but it carries the danger of putting an end to the pooling of risks, the very grounds of the insurance industry. The heated debate in mutualist insurance companies for or against introducing age categories in health insurance has blown over. Nowadays, the information available in insurance company and public databases (when accessible) can be used to “individualize” risks.

Nor is this trend new. It existed long before what we now call big data and data-mining (a process for extracting relevant information from huge quantities of data). Nowadays however, the tools of information technology can be used not just to process big data but also, thanks to AI, to factor in the degree of veracity and precision of the data. Artificial intelligence is present in many of the situations covered by insurance policies and, too, in the work of the “assistants” used to lower insured risks. I might mention in random order: self-driving cars, security procedures via face or fingerprint recognition, enhanced reality, virtual health assistants or even robots for surgery (KOENIG *et al.* 2016).

The insurance business also (if not above all) entails a management of risks and predictive analytics (*i.e.*, the analysis of data to draw up models of events that might happen... a method useful for predicting consumer behavior patterns). To a new technology and new behavior patterns correspond new risks that, if controllable and quantifiable, provide new business to insurance companies, as they become risks to be covered by new policies. If these new risks cannot be controlled and quantified, (prudential) companies try to protect themselves from such so-called “emerging” risks by extending protection to customers via equity or pricing solutions or; ultimately, they might even refuse to cover the risks.

Insurance companies and their clients (businesses and, even more so, private persons) are very attentive to cyberrisks. Ranging from the risk of losing data with, as a consequence, a discontinuity in business services to the risk of data being fraudulently used with, as a consequence, the damage to one’s reputation... such are the risks that insurance companies are now trying to control in order to better protect their own business and to respond to customers’ expectations for coverage.

The approach to handling the risks inherent in AI is similar. The starting point is familiar if we recall how information systems have been designed and built: in case of error, the party who designed or built the system is held liable, and can be sued. The same holds for systems incorporating AI... but the idea of “learning” introduces complications.

If the response from a robot or chatbot is erroneous and if this error has consequences, who will be held liable? The manufacturer (who made the machine), the user (who fed his data into the machine) or, at the end of this line of reasoning, the robot or chatbot (since it is self-learning)?

A century ago, someone floated the idea that pedestrians carrying red flags should walk fifty meters in front of cars... to warn other pedestrians that cars were coming. Closer in time, we have come to ask for confirmation by snail mail or telephone calls and e-mail messages. The immediacy now characterizing contemporary society pushes us toward accepting the answers from robots or chatbots as words of honor.

The beauty of insurance is that, to cope with any industrial or technological innovation, it must advance toward an objective that is also moving. Insurance will come up with a solution once it is possible to quantify the risks technologically and economically and, in many fields of liability, legally.

Since we are at the very start of this process, we should not be surprised that nothing of the sort exists yet. Let us imagine, however, that all parties — insurers, customers, lawmakers — work together in anticipation of a trend that, like the Internet, will not accept to be restrained owing to insurance problems or a regulatory framework. The comfortable society where we live wants to advance fast and banish risks. But the principle of (systematic) precaution is no solution. It is merely a political reaction, overcautious (often superficially so), to the progress of science and technology — a progress that we would very unlikely accept to reverse.

Let us accept that AI already exists and will spread. It is, therefore, high time to take it into account when analyzing risks and to find the insurance solutions — not in order to eliminate risks (which will arise as with any innovation) but to try to cover, as far as possible, the consequences.

## **Questions about responsibility and ethics**

The value chain and risk management are two key topics raised by the coming of artificial intelligence in the insurance world. There are, too, ethical and societal consequences.

Artificial intelligence obviously raises questions about data privacy. Isaac Asimov anticipated this before the concept of AI intelligence was current.<sup>2</sup> These questions are still not settled today.

Some of the effects of big data, data-mining and, more broadly, AI clearly benefits customers. Who would not be satisfied to not have to answer for an umpteenth time questions about his/her date and place of birth? Who would be unhappy with a much shorter questionnaire when enrolling on an insurance plan? What some clients interpret positively (*e.g.*, the advice they expect to receive) might be interpreted by others as an unbearable invasion of privacy or an obstruction to their free choice (*e.g.*, when a given product is proposed to them as a function of their profile). There is; of course, no single answer, white or black, to these questions. Since the start of the digital revolution and elsewhere than in the insurance field, questions of this sort have moved customers, salespersons, and... lawmakers to action.<sup>3</sup>

Let us review and classify the questions raised in the foregoing paragraphs. This first set of questions probably has no direct relation to AI; it is more a matter of consumer protection. Like other forms of digital technology, AI has simply made these questions more urgent:

- understanding customers' needs;
- the transparency of the offers made by insurers;
- the quality of advice; and
- the quality of the customer experience.

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<sup>2</sup> In a short story written in 1942, Isaac Asimov (1920-1992) formulated the three laws of robotics for protecting people from robots.

<sup>3</sup> I cannot resist illustrating the cultural and political nature of this problem by citing an interview between Laurent Alexandre and Cédric Villani in *Challenges*, 538, 19 October 2017. — L. Alexandre, "Europe has established no link between its industrial policy, its policy of consumer protection, its protection of private data and its competition law. There is no unified EU regulatory organization, and the various European agencies on informatics and freedom [like the CNIL in France] have boosted the growth of American platforms by preventing the formation of big databases in Europe. The United States has GAFA [Google, Apple, Facebook, Amazon], we have the CNIL and digital midgets." — C. Villani: "European regulations have been designed to protect the private lives of citizens from widespread surveillance. Well-designed protection can, at the start, seem like a weakness. The collection of data will be slower but with safeguards."

A second set is related not only to insurance techniques but also to the place of risk and responsibility in our society:

- the pooling of risks;
- liability for direct damages;
- the assessment of indirect damages; and
- the role of, and trends in, the regulations.

A last set of problems lies closer to ethics:

- the protection of customer privacy; and
- the employability of wage-earners.

In more general terms, there is a debate about the acceptance of change and the refusal of withdrawal and isolation.

This is a complex field in the sense of complexity, as used by Edgar Morin (1982), of something “woven together”, in our case: progress and risks. This is the basis of systemic theory (DE ROSNAY 1975).

In our uncertain, incomplete world with ongoing interactions, the emergence of new risks and the control over them through insurance are related, interacting topics. AI has an impact on insurance, which can foster or hinder the acceptance of AI. This is nothing new, apart from the fact that the changes are bigger and faster nowadays. The size and speed of change are what arouse in some people feelings of dehumanization — a frustration in customer relations and a danger in labor relations. Once again, insurance is nearby since these feelings generate new risks to be covered... by insurance. These quite real risks can, however, be controlled if we remember to place human beings at the center of relations — even in a digital world where AI will be ever more present.

Artificial intelligence should not be a form of organization or management of firms or society. It is a tool with benefits that outstrip the risks under condition that we change our conceptions of organization and management.

Humanity has always managed, chaotically, to domesticate its innovations. Some people believe that this is no longer possible. They want our society to give up. They see an unequal world arising where digital nations are the equivalent of colonies in the past (HARARI 2017). But that is not inevitable. AI can, in my opinion, be beneficial to men and women in our protected Western democracies.

Elites, education and firms have roles to play. Of course, the prediction that “*a large number of occupations are going to disappear, especially in median employment*”<sup>4</sup> has a high probability of coming true. To borrow from what a labor leader once told me, we must “learn our colleagues to relearn”.

The books by Isaac Getz (2017) and by Alain Roumilhac and Gérald Karsenti (2016) and the lectures by Sophie Floreani (founder of Ara & Co) at Sciences Po and the School of Digital Communication 2089 in Besançon remind us of our duties as leaders while showing us that this is possible!

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<sup>4</sup> C. Villani during the interview mentioned in the preceding note.

## Conclusion

Insurers usually tend to “make it long and complicated”. The subject matter tends to be long and complicated, and the regulatory framework does not induce insurers to be concise. The jargon might enable them to “show off their science” (and probably to hide its limits). This is even truer when the topic is emerging risks.

Many articles have emphasized what AI brings to insurers while overlooking its complexity and the gap with customers. This narrow view might not even prove operational... unless we are convinced of the need to simplify our systems and are, owing to the digital revolution, more than ever committed to maintaining, at the core of these systems, what is human.

Artificial intelligence, like any major innovation, is both an opportunity and a risk for our society, economy and ourselves. Insurers must take account of this in order to continue playing their role in an ever faster changing world. They must help “defy uncertainty” (to paraphrase the assignment that Aviva has set for itself).

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