Cognitive Intelligence to boost Digital Transformations in FSI

Still considered science fiction a few years ago, Artificial Intelligence (AI) is now becoming a part of our business environment, just as Alan Turing had predicted. AI is reinventing the entire ecosystem of the Financial Services Industry (FSI) with new business models designed to be more effective, accurate, and self-adaptive. By increasing the level of automation and using dynamic systems, AI supports decision management, enhances customer experience, and increases operational efficiency.

This article deals with the potential implications and applications of AI in the FSI. First, a general presentation will demystify AI. Then, a second part will describe some applications in FSI and more specifically an AI-powered chatbot dealing with MiFID. Finally, we will focus on the outputs and actionable insights for CIOs.
“I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted.”

Alan Turing, *Computing Machinery and intelligence*, 1950
“Artificial Intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.”

John McCarthy, Stanford University

Demystifying Artificial Intelligence
AI encompasses, among other things, cognitive automation, cognitive engagement, and cognitive insights:

Cognitive automation
Enable machines to replicate human actions and judgment with robotics and cognitive technologies

Cognitive engagement
Use intelligent agents and avatars to deliver mass consumer personalization at scale and smarter, more relevant insights to amplify end user experience

Cognitive insights
Employ data science and machine learning to detect critical patterns, make high-quality predictions, and support business performance

Thanks to cognitive intelligence, AI-powered systems are able to mimic some aspects of human intellect by:

• Recognizing and understanding elements for which they are programed. This is the first step of cognitive AI. For example, syntax of a text, shapes in handwritten text, figures or faces on an image or a video, syntax of voice, and much more.

• Applying context and interactions
The capacity to represent links between different pieces of information. For example: “Bob is a dog. Dogs are animals. Dogs hate cats.”

• Reasoning and making decisions
Consists of interpreting the information recognized, possibly by making links with context. Then, decisions are made based on AI insights.

• Identify semantics
Reasoning and making decisions also works as an enabler to identify the meaning of information recognized. For example, the sentence “I am going to the bank” can have two meanings (the establishment or the riverbank), it is necessary to know the context and to make a link to better understand the meaning of this sentence.

• Learning and improving
The last and most crucial step of cognitive AI is the function of learning from the data provided, but also from mistakes in order to self-improve. This capacity is referred to as machine learning.
Artificial intelligence capabilities

1. Deloitte - Cognitive Advantage
2. Deloitte - Demystifying Artificial Intelligence
3. Deloitte LLC framework
Major trends that are profoundly affecting FSI
Before focusing on specific AI use cases in FSI, this section will present the major trends that currently affect the financial services industry. The year 2017 seems to mark a turning point in FSI. Major trends are profoundly affecting this industry with digital transformation, which is revolutionizing business organizations.

Machine intelligence is one of the main technological trends for 2017, helping companies to make better decisions thanks to AI capabilities.
**Digital Transformation in FSI**

**Exponential growth of data volume:**
First, the increasing use of social networks and connected devices due to the Internet of Things (IoT) has led to an exponential growth of data volume.

**New players on the marketplace:**
New players such as FinTechs and startups are entering the marketplace with innovative solutions.

**Increasing customer expectations:**
Customers’ needs are constantly evolving with increasing levels of expectations.

**New risks:**
Innovative technologies simultaneously lead to new problems such as privacy and new risks such as fraud and cybercrime.

**New regulations:**
New regulations aim to limit the usage of personal data (e.g. General Data Protection Regulation) or to increase investor protection (e.g. MiFID II).

**New technologies:**
Finally, new technologies deal with Big Data problems to help process large amounts of structured and unstructured data.
Most companies in the financial sector have already initiated their AI journey
Around nine companies out of ten have already started working with AI. In 2017, 32 percent of companies in the banking industry are in the developing phase of their AI journey.

Financial companies adopt AI with specific applications in mind, such as customer service, back office, operations, financial advisers, fraud detection, and risk management. In 2017, 65 percent of companies in the banking industry believed that AI would have a significant impact on customer service.

The AI journey in the banking industry (2017)

- Developing: 32%
- Maturing: 17%
- Learning: 40%
- Not yet started: 11%

Top 5 impacts of AI on the banking industry

- Customer service: 65%
- Back office / Operations: 52%
- Financial advisors: 42%
- Fraud detection: 31%
- Risk management: 29%

5. Deloitte – AI and you: Perceptions of Artificial Intelligence from the EMEA financial services industry
FSI case study: a chatbot for MiFID
This section will focus on one of the current hot topics in FSI that has a profound effect on customer service. The regulation Markets in Financial Instruments Directive II reshapes the FSI, and we investigate how AI can help financial players to deliver a superior customer experience while still being compliant.

MiFID II, reshaping FSI
MiFID II is a reform of MiFID I that will enter into force in January 2018. MiFID I provides harmonized regulation for investment services across the European Economic Area. Its primary objectives are to increase competition as well as consumer protection, notably after the subprime crisis of 2008 that led to political change around safety and soundness in the financial system.

Focusing on consumer protection, MiFID II emphasizes the propensity to take risks and the ability to bear losses for consumers. One of the main requirements is to categorize clients as retail, professional, and eligible counterparties with an increasing level of protection. For each kind of client, clear procedures must be implemented to assess their suitability for a given investment product.

MiFID II is one of the most ambitious reforms introduced by the EU in response to the 2008 crisis. MiFID II and MiFIR reinforce consumer protection and securities markets by introducing specific rules such as best execution, client reporting, complex financial instruments, and more. Therefore, the complexity of these new laws and regulations is now prompting financial services providers to initiate comprehensive IT projects and operational changes.

Today, financial services providers implement MiFID procedures with questionnaires to gather the required information from their clients. A MiFID questionnaire is composed of three different sections:
1. Investment objectives of the client
2. Knowledge and experience of investors
3. Financial situation
A chatbot is a computer program that mimics conversations with users applying AI.

Why financial services providers should reconsider the way to tackle MiFID requirements
Currently, financial services providers use paper or electronic forms for the MiFID questionnaires. The MiFID questionnaires are particularly long and exhaustive (11 to 57 questions, depending on the bank). The time estimated to complete such a questionnaire is on average about 20 to 25 minutes. Moreover, the client may have some difficulties in understanding some questions, and this can lead to errors in the evaluation of the risk profile.

MiFID questionnaires can negatively affect customer experience if incorrectly implemented. Some common pitfalls include asking hard-to-understand questions or requesting too much information. In this context, chatbots can be used to improve experience for specific segments such as self-directed and digitally savvy customers.

Key functionalities of a chatbot
A chatbot can be embedded into any bank application. For example, when the customer has enough liquidity in his personal accounts, the AI-powered system will directly make the proposition to invest. The client has the possibility to interact with the chatbot to complete the mandatory MiFID questionnaire through an intuitive and user-friendly journey.

The solution synthesizes natural language text, extracting data from the user inputs at a rapid pace. The client’s answers are stored in the database in order to create a full picture of client knowledge and experience, complete with risks and objectives. More precisely, the chatbot uses Natural Language Processing (NLP) to understand the customer’s inputs.

Therefore, by chatting with the customer, the solution can gather information requested for the MiFID questionnaire and determine the profile of the investor.

Moreover, there is the potential to collect initial data directly from the user account in order to focus on questions that are more specific during the conversation.

The chatbot is a breakthrough in performing investment profiling by offering an innovative user experience for the MiFID questionnaire.
**Main benefits of the chatbot**

In this context, the chatbot is a breakthrough in performing investment profiling by offering an innovative user experience for the MiFID questionnaire. Indeed, it asks personalized and accurate questions to the client and from this is able to search for the available requested information and saves time by focusing on the client objectives. It can save time for financial services providers and for the customers by avoiding manual inputs of customers’ answers but also because the chatbot can handle multiple conversations simultaneously. Moreover, this solution represents a key step toward paperless organizations.

The chatbot is very easy to adapt for financial services providers. It can be adapted to different kinds of questionnaires addressed to multiple types of customers (retail clients, professionals, eligible counterparties) and for different kinds of providers (retail banks, private banks). Its investor profile evaluation model can also be easily adapted if the provider wants to change the weight of one characteristic. This way, the chatbot is ready to handle any kind of change in the MiFID questionnaire.

User friendly and easy to adapt, this solution can be a real asset in the financial services industry by saving time for both financial services providers and customers, while providing digital and mobile solutions to their evolving habits, toward a simple and smarter interface. This endeavors to provide a great customer experience.
Key takeaways for CIOs
Major trends are profoundly affecting FSI, such as the exponential growth of data volume, evolving client expectations, the emergence of new risks, and increasing regulatory pressures. In this context, AI is reshaping the financial industry by enhancing customer experience, increasing the level of automation, and enabling organizations to derive deep and actionable insights to support decision management. Huge expectations are currently surrounding AI, and it could be the next breakthrough in the financial industry supporting digital transformations. Within the next three to five years, we expect an exponential increase in the number of AI-based applications. Companies know the great potential that AI could bring. Most companies already started taking their first steps in their AI journey, by adopting technologies through proofs-of-concept to rapidly test new models for implementation.

Chatbots are becoming one of the most effective AI applications, which are becoming a privileged way to interact with customers across a large panel of industries, including FSI. They limit human intervention and the potential risk of operational errors. They can also provide a seamless customer experience, with natural language capabilities, sentiment analysis, and process automation. While providing a great customer experience with personalized advice and recommendations, chatbots also save time for financial service providers, enabling them to deal with the new challenges they are facing.

AI represents a key differentiation factor, unlocking benefits through operational efficiency and enhanced user experience. It is rapidly becoming a necessity to jump quickly onto the AI bandwagon to take advantage of this technological trend. Indeed, it enables to achieve competitive advantages through automation, cost optimization, insight-driven decisions, and customer experience enhancement.

Nevertheless, despite the disruptive potential of AI, key challenges need to be tackled in order to unleash its true power. Main concerns related to AI implementation in FSI are identified in a survey published in 2017 by EFMA and Deloitte, such as hacking and cybercrime, scarcity of technical talent, and limited understanding of data technology.

Main concerns about Artificial Intelligence

<table>
<thead>
<tr>
<th>Concern</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Hacking/Cybercrime</td>
<td>12%</td>
</tr>
<tr>
<td>Scarcity of technical talent</td>
<td>12%</td>
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<tr>
<td>Limited understanding of data technology</td>
<td>12%</td>
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<tr>
<td>Sustainability</td>
<td>9%</td>
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<tr>
<td>Existential threat to humanness</td>
<td>9%</td>
</tr>
<tr>
<td>No ownership/Accountability</td>
<td>8%</td>
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More generally, executives are concerned about the impacts of AI on their organizations and business models. Companies should start building knowledge and expertise and develop key competencies around AI in an attempt to better understand its implications in terms of security, compliance, and scalability. They could adopt a dedicated approach to start small and rapidly implement new prototypes into production. It is fundamental that key building blocks are implemented with the required capabilities to ensure proper data management across the firm. An initial step is to start testing AI through a first simple proof-of-concept, which enhances awareness and demonstrates its true potential. Given the role that CIOs play in security, data management, and digital operations, they are in the ideal position to lead the AI revolution, and to demonstrate its power and usefulness across the firm with concrete use cases. Successful projects require support from executives and accountable stakeholders; it is hence crucial to convince them by demonstrating its importance and benefits.

Huge expectations are currently surrounding AI, and it could be the next breakthrough in the financial industry supporting digital transformations.

6. Deloitte - Artificial Intelligence (AI) goes mainstream
7. Deloitte – AI and you: Perceptions of Artificial Intelligence from the EMEA financial services industry