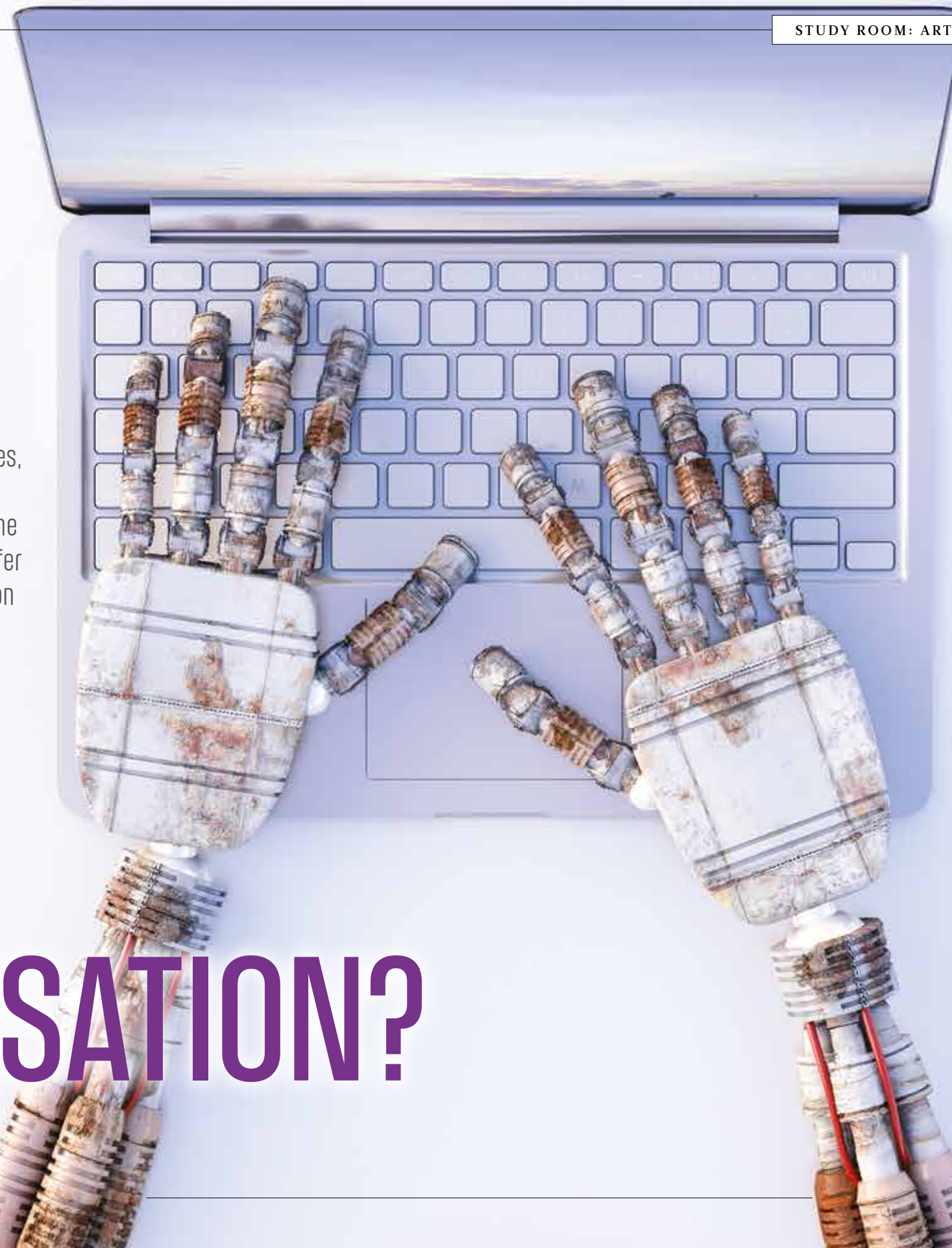


INTELLIGENT

STUDY ROOM

As AI continues to create a buzz in financial services, **William Rayer** and **Dr Quintin Rayer** examine whether chatbots can offer a practical implementation



The role of artificial intelligence (AI) is becoming more widely discussed in wealth management and other investment applications. In this article, we outline its primary business applications, before focusing on conversational AI and how close current ‘chatbots’ might be getting towards being capable of helping with financial advice.

In wealth management and financial services, AI includes the following:

1. Business process automation: Some repeated tasks, such as trust and company administrative work and due diligence processes can be partly automated. The decision-making process can be encoded by experts into ‘rules engines’ and ‘decision tables’. This is already a relatively mature area, used in business process management.

2. Automated client service: The front end of enquiry desks, phone-banking systems and helpdesks can be routed to conversational or text interfaces managed by an AI. A well-designed AI can pass more complex queries to human operators, enabling staff to handle a higher call volume and more challenging questions. This is a relatively new area – typically some helpdesk systems now offer AI modules as additions to their existing products, allowing some enquiries to be handled automatically.

3. Automated trading systems: Although not directly associated with wealth management, these systems are a classic AI application. They follow defined trading rules previously created and validated by experts. High-frequency trading systems are used by larger banks and hedge funds, generally trading with other similar systems. Although not covered here, these are specialised, proprietary systems without a conversational interface.

The above systems have one thing in common – they are focused on one area but have no capability outside it. For example, no business process automation system or trading system could answer a customer query, just as a world-class chess programme cannot play noughts and crosses.

CONVERSATION?

ARTIFICIAL GENERAL INTELLIGENCE

A recent approach to AI is artificial general intelligence (AGI). An AGI application interacts across a much broader subject area, which is closer to what humans would class as 'intelligent'. A true AGI would cover many skills including the ability to control a self-driving car, play chess and the unique abilities of many other existing AI applications. It would also be able to integrate these into a coherent whole. At present, no such AGIs exist; the nearest incomplete implementations are 'chatbots'.

After initial enthusiasm in the 1950s, little effort was put into 'general' intelligence and AI development efforts focused on specific areas, including voice recognition, text to speech, autonomous navigation, image processing and chess computers. AGI was regarded as impractical and little research took place.

An exception was the ambitious 'Cyc' project in 1984, launched by Cycorp in the US, which aimed to represent general knowledge and reasoning. The other exception was chatbots – conversational AI programmes that give responses to user inputs. Chatbots are not new – the first chatbot 'Eliza' dates back to 1966 and was able to engage in lengthy conversations. However, the heuristic approach used by chatbots was not accepted in wider AI circles: although chatbots could hold a conversation, they had no depth of knowledge. Conversation seemed a trivial use of AI.

During the past few years, this has radically shifted. High-performance computing based on better hardware has enabled new techniques, including loading 'datasets' into a chatbot's memory. These datasets can include details of investment products together with their applications, as well as pros and cons. An AGI can load multiple datasets, making it possible for them to have a degree of domain-specific knowledge.

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TURING TEST

An early test of computational intelligence was devised by Alan Turing in the 1950s. He proposed that a test of whether a computer was intelligent would be if a person were unable to distinguish between a conversation with the computer and another human being. Of course, certain aspects have to be addressed; since a computer with AI does not look human, 'conversation' has to be typed via a keyboard and the discussion partners (human and AI) have to be physically separated. Thus, the Turing test measures the intelligence of a computer, by comparing its conversational ability to that of a person.

The annual Loebner Contest is a formal Turing Test run at Bletchley Park, set up by Hugh Loebner and run by the The Society for the Study of Artificial Intelligence and Simulation of Behaviour since 2014. Human judges use a text interface to 'talk' with a computer and with a person, without knowing which is which. If the judges cannot tell the computer apart from the person, the computer's conversational intelligence is considered similar to a person's.

Conceptually, the Turing Test is easy to understand, set up and run, while avoiding abstract questions about the nature of thought.

The Loebner Contest has been run annually from 1990 to identify the best chatbots and see if any of them can fool a judge into thinking it is a real person. To date, no chatbots have convinced the judges. Uberbot.ai ('Uberbot') is a chatbot that has been a challenger at the Loebner Contest for several years and is an entrant to this year's competition, held at Bletchley Park on 8 September.

Returning to the field of wealth management, last year P1 demonstrated Uberbot at the September 2017 CISI conference. P1 primed Uberbot with financial datasets, investment knowledge and staff biographies. The P1-Uberbot combination held conversations similar to the example below.

Uberbot was primed with a dataset of financial products including a definition of a state pension as providing income in retirement. When asked how to get income in retirement, the AI inverted this information to answer the question. Another dataset defined staff members' expertise in different areas, so the chatbot could answer questions such as "Who should I talk to about ...?" or "Who knows the most about...?"

Although the chatbot has a limited depth of knowledge, it can hold a realistic conversation and enable more complex queries to be passed onto a real person. This level of technology could be embedded in a website and is available using 'off-the-shelf' chatbots such as Uberbot.ai combined with carefully designed datasets, making this an affordable and practical approach to using AI. ●

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EXAMPLE

Client: How do I get income in retirement?

P1-Uberbot: State pensions are used to give income in retirement.

Client: Who knows the most about growth focus investing?

P1-Uberbot: Try asking Will Dickson, P1's head of portfolio management, about growth focus.

Client: What is a SIPP?

P1-Uberbot: A self-invested personal pension is the name given to the type of UK government-approved personal pension scheme.