

Jeopardy and the future of risk management

Computers may triumph playing Jeopardy, but that represents mastery of only one dimension of what we call human intelligence, argues David Rowe

The US was recently riveted by a three-day contest of Jeopardy that pitted the two most successful players in the history of the game show against a massive computer from IBM called Watson.¹ For those who may not be familiar with it, Jeopardy is a long-running television game show in the US and was probably the inspiration for the parlour game Trivial Pursuit.

In the end, the computer triumphed in the head-to-head contest, despite some quite silly blunders.² Building a computer that could win this contest is a far more impressive accomplishment than when Big Blue, another IBM computer, defeated Garry Kasparov in a chess match. Jeopardy is played with an open-ended set of categories and often involves obscure word games that rival Cockney rhyming slang. To be even credible as a contestant, the computer had to process natural language, recognising syntax, homonyms and subtle nuances of meaning.

Of course, this triumph of a mechanical device over flesh-and-blood opponents prompted a great deal of comment about humans being obsolescent and eventually succumbing to the tyranny of the machine. Such hand-wringing goes back at least to the legend of John Henry and the steam hammer. In recent years, it has been renewed with increasing frequency as computer processing power has exploded. It seems to me, though, that this recurring angst is misdirected.

We frequently say computers are 'intelligent' and becoming more so. However, it is important to distinguish the multiple facets of what we mean by intelligence. If we go back 150 years or more, people who could rapidly and accurately sum up a long string of numbers were deemed to be very intelligent. This feat undoubtedly does require a special mental skill. When electronic computers arrived and such machines could perform this task far faster and more accurately than humans, it was said that machines were taking over. Sound familiar?

Another example is close to my own experience. When I was in college, people who could apply the complex rules of symbolic integration to complex formulas and derive the expression for the integral were thought to be brilliantly intelligent. Today, the software package Mathematica can perform this same task much more effectively than humans.

Another thing we often associate with intelligence is memory and the ability for instant recall on demand. Needless to say, this is an area where computers have a big advantage, although the instant recall part can be a bit tricky. Elaborate and carefully organised meta-data, however, can enable computers to achieve virtually instant recall. Think of Google, which reportedly maintains 20 exobytes (20 billion gigabytes) of fundamental data and 80 exobytes of meta-data to index it effectively. The point is that brute force and clever organisation can do a great deal to allow machines to mimic human capabilities.

The question remains, however: are computers 'more intelligent' than humans? I say no. Just because computers can be made to mimic many human capabilities we associate with intelligence does not make them intelligent in the fundamental sense of mentally creative. It will be a long time before computers can come even close to replicating the full range of human intelligence.

Nevertheless, the amazing strides computer scientists have made in my lifetime do have current implications. Most particularly, old ways of making decisions will not compare well with methods that leverage the advances in computer capabilities. Medical diagnosis, for example, can be greatly assisted by the synthesising power of computers. Doctors who rely on their personal recall of various symptoms and possible causes will fall short of another, possibly less fundamentally brilliant doctor who has mastered and uses computer-based diagnostic tools. The important point to keep in mind is that the results from such tools are suggestive and not conclusive. Most importantly, such systems can occasionally come up with silly conclusions.

What holds for medical diagnosis holds equally for risk assessment. Statistical systems can be a powerful aid to insight and understanding. Taking their results uncritically and at face value, however, is a prescription for disaster. Only an intelligent analyst who understands the power and the limitations of the results of computerised analytics can know when and how seriously to take them. As I have said for many years, technology can and must be a tool to condition and support sound judgement, but it will never replace such judgement (at least, not in my lifetime and not in the lifetimes of any you reading this). ■

¹ For those not familiar with the history of IBM, the computer was named after Thomas Watson, the corporation's founder, not Sherlock Holmes's sidekick

² To a question about the US city with one airport named after a World War II hero and a second airport named after a World War II battle, both human contestants correctly named Chicago (O'Hare and Midway). Watson guessed Toronto, which is in Canada. There is a city in Iowa called Toronto, but in 2000 its population was 134, so I suspect it does not even have one airport, let alone two

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