Machines beat us at our own game: What can we do?

February 17 2011, By SETH BORENSTEIN and JORDAN ROBERTSON , Associated Press

In this undated publicity image released by Jeopardy Productions, Inc., host Alex Trebek, left, poses with contestants Ken Jennings, center, and Brad Rutter and a computer named Watson in Yorktown Heights, N.Y. On Monday, Feb. 14, 2011, "Jeopardy!" will begin airing two matches spread over three days between Jennings, Rutter and Watson, who was developed by IBM scientists. (AP Photo/Jeopardy Productions, Inc.) NO SALES

(AP) -- Machines first out-calculated us in simple math. Then they replaced us on the assembly lines, explored places we couldn't get to, even beat our champions at chess. Now a computer called Watson has bested our best at "Jeopardy!"

A gigantic computer created by IBM specifically to excel at answers-and-questions left two champs of the TV game show in its silicon dust after a three-day tournament, a feat that experts call a technological

breakthrough.

Watson earned $77,147, versus $24,000 for Ken Jennings and $21,600 for Brad Rutter. Jennings took it in stride writing "I for one welcome our new computer overlords" alongside his correct Final Jeopardy answer.

The next step for the IBM machine and its programmers: taking its mastery of the arcane and applying it to help doctors plow through blizzards of medical information. Watson could also help make Internet searches far more like a conversation than the hit-or-miss things they are now.

Watson's victory leads to the question: What can we measly humans do that amazing machines cannot do or will never do?

The answer, like all of "Jeopardy!," comes in the form of a question: Who - not what - dreamed up Watson? While computers can calculate and construct, they cannot decide to create. So far, only humans can.

"The way to think about this is: Can Watson decide to create Watson?" said Pradeep Khosla, dean of engineering at Carnegie Mellon University in Pittsburgh. "We are far from there. Our ability to create is what allows us to discover and create new knowledge and technology."

Experts in the field say it is more than the spark of creation that separates man from his mechanical spawn. It is the pride creators can take, the empathy we can all have with the winners and losers, and that magical mix of adrenaline, fear and ability that kicks in when our backs are against the wall and we are in survival mode.

What humans have that Watson, IBM's earlier chess champion Deep Blue, and all their electronic predecessors and software successors do not have and will not get is the sort of thing that makes song, romance,

smiles, sadness and all that jazz. It's something the experts in computers, robotics and artificial intelligence know very well because they can't figure out how it works in people, much less duplicate it. It's that indescribable essence of humanity.

Nevertheless, Watson, which took 25 IBM scientists four years to create, is more than just a trivia whiz, some experts say.

Richard Doherty, a computer industry expert and research director at the Envisioneering Group in Seaford, N.Y., said he has been studying artificial intelligence for decades. He thinks IBM's advances with Watson are changing the way people think about artificial intelligence and how a computer can be programmed to give conversational answers - not merely lists of sometimes not-germane entries.

"This is the most significant breakthrough of this century," he said. "I know the phones are ringing off the hook with interest in Watson systems. The Internet may trump Watson, but for this century, it's the most significant advance in computing."

And yet Watson's creators say this breakthrough gives them an extra appreciation for the magnificent machines we call people.

"I see human intelligence consuming machine intelligence, not the other way around," David Ferrucci, IBM's lead researcher on Watson, said in an interview Wednesday. "Humans are a different sort of intelligence. Our intelligence is so interconnected. The brain is so incredibly interconnected with itself, so interconnected with all the cells in our body, and has co-evolved with language and society and everything around it."

"Humans are learning machines that live and experience the world and take in an enormous amount of information - what they see, what they

taste, what they feel, and they're taking that in from the day they're born until the day they die," he said. "And they're learning from all the input all the time. We've never even created something that attempts to do that."

The ability of a machine to learn is the essence of the field of artificial intelligence. And there have been great advances in the field, but nothing near human thinking.

"I've been in this field for 25 years and no matter what advances we make, it's not like we feel we're getting to the finish line," said Carnegie Mellon University professor Eric Nyberg, who has worked on Watson with its IBM creators since 2007. "There's always more you can do to bring computers to human intelligence. I'm not sure we'll ever really get there."

Bart Massey, a professor of computer science at Portland State University, quipped: "If you want to build something that thinks like a human, we have a great way to do that. It only takes like nine months and it's really fun."

Working on computer evolution "really makes you appreciate the fact that humans are such unique things and they think such unique ways," Massey said.

Nyberg said it is silly to think that Watson will lead to an end or a lessening of humanity. "Watson does just one task: answer questions," he said. And it gets things wrong, such as saying grasshoppers eat kosher, which Nyberg said is why humans won't turn over launch codes to it or its computer cousins.

Take Tuesday's Final Jeopardy, which Watson flubbed and its human competitors handled with ease. The category was U.S. cities, and the

clue was: "Its largest airport is named for a World War II hero; its second largest, for a World War II battle."

The correct response was Chicago, but Watson weirdly wrote, "What is Toronto?????"

A human would have considered Toronto and discarded it because it is a Canadian city, not a U.S. one, but that's not the type of comparative knowledge Watson has, Nyberg said.

"A human working with Watson can get a better answer," said James Hendler, a professor of computer and cognitive science at Rensselaer Polytechnic Institute. "Using what humans are good at and what Watson is good at, together we can build systems that solve problems that neither of us can solve alone."

That's why Paul Saffo, a longtime Silicon Valley forecaster, and others, see better search engines as the ultimate benefit from the "Jeopardy!"-playing machine.

"We are headed toward a world where you are going to have a conversation with a machine," Saffo said. "Within five to10 years, we'll look back and roll our eyes at the idea that search queries were a string of answers and not conversations."

The beneficiaries, IBM's Ferrucci said, could include technical support centers, hospitals, hedge funds or other businesses that need to make lots of decisions that rely on lots of data.

For example, a medical center might use the software to better diagnose disease. Since a patient's symptoms can generate many possibilities, the advantage of a Watson-type program would be its ability to scan the medical literature faster than a human could and suggest the most likely

result. A human, of course, would then have to investigate the computer's finding and make the final diagnosis.

IBM isn't saying how much money it spent building Watson. But Doherty said the company told analysts at a recent meeting that the figure was around $30 million. Doherty believes the number is probably higher, in the "high dozens of millions."

In a few years, Carnegie Mellon University robotic whiz Red Whittaker will be launching a robot to the moon as part of Google challenge. When it lands, the robot will make all sorts of key and crucial real-time decisions - like Neil Armstrong and Buzz Aldrin did 42 years ago - but what humans can do that machines can't will already have been done: Create the whole darn thing.

More information: IBM's Watson: tinyurl.com/4r8w6gr
Jeopardy: jeopardy.com