



Competence versus Computing: which will win in modern grid analytics?

Recently I had the rare opportunity to watch a movie in a cinema, just as it actually should be and not during a long haul flight in “binge mode” months after the film’s come out. The film was “Pawn Sacrifice”, based on the true story of US chess super-talent Bobby Fischer and his quest against top Soviet grandmasters during the cold war.

IMHO, chess is a great example for the tension referenced in this blog’s headline. I used it some time back for a keynote presentation and related discussions shared with executives in the utilities industry. Let me go back a few years to 1997, when the phalanx of IT supporters (apparently) prevailed against the other side, who claimed computers would never beat human experts. In that year, the first computer system (Deep Blue) defeated the reigning world champion Garry Kasparov in a series of matches under standard chess tournament conditions. So, IT finally took over. Even in chess. Darn it!

Well, there is also a side story to this 1997 chess-giant duel that one should know before judging further. Firstly, it is highly likely that every historical professional game was stored in Deep Blue’s code, and therefore all available expert knowledge could be leveraged by the machine. But, secondly, more interesting is that while the man versus machine tournament was taking place, a huge group of experts was allowed to modify and upgrade the machine. I think you get my point: Kasparov did not lose against a machine. He lost against humans and a machine. And this powerful combination of experts and computing power is what I pointed to in my keynotes.

But that was “back then”, in the last millennium. In the meantime computers, as we all know, have become - and constantly so - much more powerful (Moore’s law and Kryder’s law). And the power in the fight between man and machine has massively shifted towards machines...at least for chess. Interestingly, in the game “Go”, which has a far easier set of rules than chess, but a much larger table with

19x19 squares, computers only very recently managed to beat the best human players, actually as late as 2015. In Go, there are 2×10^{170} possible positions and this seemed to make it a really hard nut to crack. BTW: In chess there are “only” 10^{43} possible permutations, and to give you a feel for the order of magnitude, there are around 10^{80} atoms in our universe. So, in 2015, finally, strong proof: machines really did take over. Right?

Actually no, I think we need to take a more sophisticated view. Question is not if this is the case, but whether it is always the case! As some background, I am a physicist. While there are huge computer clusters required to process the Terabytes or even Petabytes of data coming out of my former colleagues’ experiments (actually global computing grids spanned over the whole planet), it is still the elementary particle physicists who are able to design, plan and execute the research, interpret the results and derive new formulas and theories. And I do not see that changing.

At a recent conference on grid analytics, I took part in a panel discussion where the topic of data science was brought up, as well as the question of whether experts are still needed in our Big Data era. The whole room agreed that actually, more than ever, they are and will continue to be needed.

Now, I think I can read your thoughts: You picture a conference room full of experts, confirming to themselves that they are still needed. Wow, how surprising is that...

But let’s think again: Talking about the “game complexity” of Chess and Go, the electricity grid in comparison is not 8x8 or 19x19 squares or fields, but a game board of many thousands of moving parts, following a few, well, more or less complex physical rules. So, fair enough I think, it looks like applying a few expert rules to the equation might not be the worst of all ideas.

Furthermore, the whole (physical & mathematical) system of such electricity grids has even more degrees of freedom today as renewable energy sources and decentralization kick-in.

[BTW: Always happy to exchange and learn, so if a few experts in game theory want to comment on, or challenge my line of argumentation, feel free to post your view below!]

A few weeks ago, I had a chat with a Utility, which shall remain nameless. They have started a major analytics project with an IT vendor, whose name I will not mention either. This vendor, I would assume, has all the latest, super-cool tools and Big Data platforms available, and fantastic data scientists on their staff. But the Utility complained to me that it had taken them many weeks of their best domain experts explaining to the vendor what the data they provided means. Not even exchanging at a sophisticated level about grid physics, but simply understanding the data attributes. So there are three dimensions you need to bring together to really find the gold nuggets in your data: IT, statistics and expert knowledge.

Conclusion: If you run a company with the business goal of winning chess tournaments, you can fire your grandmasters today and invest your money in some mid-size computers. On the other hand, if you run a company with the business goal of operating an electricity grid, you need to depend on your experts more than ever. Better still: I strongly recommend meshing their expertise with that of other crazy IT folks who know how to make better use of the data in the experts' systems and who bring some fresh thinking: Outside-in rulz!

I think my wife is right: we need to get our kids' baby sitter in more often and go out to the movies. This way I get ideas for new blogs. Not sure that's what she had in mind ;-)

Get in touch

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