A global KPMG survey showed that organizations cannot yet reap all the benefits of data analytics due to data quality issues and a lack of capable resources. In 30 years' time, developments in data analytics itself could solve this issue, making many current professions in the sector obsolete. The impossible will become possible, and this may well lead to an autonomous decision-making process.

The Future of Data Analytics
Making the Impossible Possible?

Maurice op het Veld

Data analytics is expected to radically change the way we live and do business in the future. Already today we use the analytics in our technology devices, for many decisions in our lives. Not only how to drive from A to B and avoid traffic-jams, but also to identify waste in business processes with the help of Lean six sigma optimization projects.

Although organizations are taking steps to turn data into insights, our global survey showed that organizations are still struggling with data quality and the problem to find the right resources to turn these insights into true value and become more data-driven.

Expectations are that data analytics will make the impossible possible, but we are still in the early stages of the data era. Basically, every company is currently investing in data analytics capabilities to keep up with known or unknown developments and competition.

You just mentioned the data era. Where are we at this moment and where are we heading for in the next 30 years?

The known data analytics development cycle is described in stages: from descriptive (what happened) to diagnostic (why did it happen), to discovery (what can we learn from it), to predictive (what is likely to happen), and, finally, to prescriptive analytics (what action is the best to take). In general, organizations currently find themselves in the diagnostic and discovery stages.

Another way of looking at this is that data analytics initially "supported" the decision-making process, but is now enabling "better" decisions than we can make on our own. What comes to mind here are cases where analytics is applied to combine multiple data sources, resulting in new and better insights, for example to combine sales, location and weather data to understand

sales increase for certain stores and improve the replenishment process.

If it turns out in the future that a decision-making process based on data analytics will produce better results, the step to "automated" decision-making will be small (e.g., artificial intelligence). Examples are the autopilot update in the Tesla model S cars, or the Google car, which has been driving around for more than 1.2 million miles without getting a single ticket.

Will this also change the way we live?

Yes, definitely, and radically, too. Tesla's Elon Musk, for example, says that one day driving your car yourself may be illegal. You may find that hard to believe now, but remember that in 1995 many people said that they could perfectly well do without a cell phone!

Developments tend to go a long way towards a situation where, for

In a world where all decisions are made automatically, you could run into known science fiction scenarios

example, you can reduce your car insurance premium when you share all sensor data of your automobile with the insurance company. Generally, we are reluctant to do so at present, but in 10 years' time this will be perfectly normal. This also impacts our driving behavior; we will drive more cautiously, because we know we are being analyzed. As a result, the switch-over to self-driving cars may become easier as well.

And also how we do business?

Yes, of course. Just like back in the industrial era of the 1900s, when we left our farms to become factory workers, we will also witness a change in job types, or even the complete disappearance of many current jobs. A study from Oxford University showed that about 47% of total US employment is at risk. And as may be expected, the work of an accountant has a 94% chance of being computerized in 20 years.

You may find this ominous, but instead we should regard it as an opportunity. New jobs will arise or jobs will change as we need resources to unlock the potential of data analytics. New capabilities required to handle the availability and storage of data will emerge with cloud providers like Amazon Web Services, Google and Microsoft Azure. Furthermore, new ways to analyze data, e.g., with machine learning and cognitive analytics, will give rise to new professions. Microsoft Cortana and IBM Watson are the frontrunners in this area at the moment.

Organizations will not need to invest in data analytics platforms, because with the cloud all capabilities can easily be scaled to the organizational needs. This can include analytical building blocks, such as data lakes, machine learning

tools and Hadoop, but also complete analytical visualization applications or apps readily available for ERP systems.

What are the opportunities for companies with these new capabilities?

All devices will be connected and exchange data within the "Internet of Things" and deliver enormous sets of data. Sensor data like location, weather, health, error messages, machine data, etc. will enable diagnostic and predictive analytics capabilities. We will be able to predict when machines will break down and plan maintenance repairs before it happens. Not only will this be cheaper, as you do not have to exchange supplies when it is not yet needed, but you can also increase uptime.

Furthermore, it will become easier and user-friendlier to link all sorts of data from various sources with each other and get insights on a real-time basis. You "google" your analytical question and you get your answers. Siri or Cortana can already do this at a basic level, acting as your personal assistant. Just imagine that this user interface will solve all your business questions; perhaps we will finally solve the business-IT alignment challenges, and may not even need Excel anymore in 30 years' time.

Are there any risks in these developments of the next three decades?

There are indeed. In a world where all decisions are made automatically, you could run into known science fiction scenarios, as described in *2001: A Space Odyssey* (1968), *WarGames* (1983) or *I, Robot* (2004). It is difficult to think ahead 30 years, but by using Moore's

Law, we can predict that computer power will double every 2 years. This means that in the next 30 years all our devices and platforms will become 32,768 times more powerful and that makes possible what is now impossible.

That is also why Stephen Hawking, Elon Musk, and Bill Gates, together with hundreds of others have sounded a note of warning against artificial intelligence by issuing the following statement: "The ethical dilemma of bestowing moral responsibilities on artificial intelligence calls for rigorous safety and preventative measures that are fail-safe, or the threats are too significant to risk". The only problem with this statement is that what is currently unethical could well be an accepted fact in 10 or 20 years' time. Just think of the personal data we publish on social media or YouTube, compared to the beginning of this century. An additional problem is that information security and law & regulation are also having a hard time keeping up with these developments.

Final question. You mentioned that organizations are currently struggling with data quality and the problem of finding the right resources. Will this be solved by data analytics itself?

Yes, but it may well take 30 years, so there is still a lot of exciting work to be done on these topics the coming years.

Maurice op het Veld is a partner at KPMG Advisory. He is involved in a variety of audit and advisory engagements at global organizations. Within KPMG Netherlands, Maurice is responsible for the data analytics services. From 2005 to 2013, he also participated in the Compact editors team.