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THOUGHT LEADERSHIP

DIGITIZATION AND YOUR WORKFORCE

Why technology isn't going to change your workforce the way you might think – and what you can do about it

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Welcome to the Singularity

Some time between 2020 and 2050, it is predicted that machines will become cleverer than people, a moment which has become known as the singularity. We have Moore's Law to thank for this, which since the 1970s has successfully predicted non-stop exponential growth in computer power. While the number of transistors on a microprocessor has increased over a million times in the last 40 years, human intelligence has remained the same (with some commentators suggesting that the ease of modern living is even blunting our mental faculties). Depending on which technology futurist you choose to believe, this will bring about anything from a utopia of machine-enhanced human intelligence to a Terminator-style apocalypse. There is no question, however, that the relentless march of processing power will continue to transform the nature of work.

[1] http://www.futuretech.ox.ac.uk/sites/futuretech.ox.ac.uk/files/The_Future_of_Employment_OMS_Working_Paper_1.pdf

[2] http://www.bruegel.org/nc/blog/detail/article/1394-the-computerisation-of-european-jobs/

DIGITIZATION AND YOUR WORKFORCE

Why technology isn't going to change your workforce the way you might think – and what you can do about it.

Digital technology will dramatically change business, but not in the way that we have been led to expect. In this paper, we explore how it alters the nature of jobs and the shape of corporations rather than simply destroying employment. This is what we call "the bagel effect". Although, as many have predicted, digitization hollows out a core of easily automated jobs and middle management posts, it also creates new business models that shift employment, creating new roles and opportunities. We show how organizations can profit from this trend by looking at their workforce in a different way and using advanced tools to simulate the future.

Destroying jobs?

Throughout history, people have lost their jobs to machines. First the manual, then the clerical and now – it is feared – the intellectual and conceptual.

Futurists including Ray Kurzweil, now a director of engineering at Google, talk of the "singularity", when machine intelligence surpasses the power of human cognition. It's often predicted that this will mean the death of work, the death of companies, or perhaps both. But whether or not we ever reach the singularity, the reality of digitization's impact on work will be more nuanced than sci-fi predictions suggest.

In their influential 2013 study[1], authors Carl Benedikt Frey and Michael A. Osborne found that 47 per cent of total US employment was at risk of being computerized within the next few years. The European Bruegel thinktank mapped Frey and Osborne's data onto EU countries[2], finding that as many of 60 per cent of all jobs are at risk, with wealthier EU countries more insulated from the phenomenon than their neighbors.

The US study suggests that computerization's effects will spread to encompass service occupations as well as transportation, logistics, office and administrative support. And it supports the idea the more educated you are, the less likely your job is to be computerized.

THROUGHOUT HISTORY, PEOPLE HAVE LOST THEIR JOBS TO MACHINES. FIRST THE MANUAL, THEN THE CLERICAL AND NOW – IT IS FEARED – THE INTELLECTUAL AND CONCEPTUAL.

PREDICTING DIGITIZATION

The Frey and Osborne study identified three characteristics that protect jobs from digitization.

Despite rapid advances in artificial intelligence, computers are still relatively weak at **social intelligence**, needed for jobs that feature negotiation, persuasion and care. CEOs, social workers and teachers can rest easy – for now. **Perception and manipulation** remains a challenge for robots, so designers, dressmakers and surgeons have little to fear. Finally, the great depth and subjectivity surrounding **creative intelligence** prevents digitization from threatening, say, the performing arts or even the computer gaming industry. However Frey and Osborne conclude that "most workers in transportation and logistics occupations, together with the bulk of office and administrative support workers, and labor in production occupations" – as well as a surprising range of service industry employees – should be planning on an imminent career change.

In Hay Group's view **social intelligence**, as identified in the study, is much more than just a skill that characterizes certain jobs. It's about people's ability to interact with one another successfully and it's a highly valuable skill in many jobs, as we've shown in our long-standing collaboration with Daniel Goleman on emotional intelligence. Under digitization, it becomes critical. Two examples from the airplane industry illustrate why.

The two-year delay and multi-billion euro budget overrun for the Airbus A380 has been attributed to a lack of successful collaboration. Because two international teams used different releases of CATIA, the CAD software, the wiring didn't fit the airplane, necessitating a costly reworking. Boeing's Dreamliner, the first airliner to use composites as a primary airframe material, was three years late and $2.5bn over budget. The project used much more outsourcing than had been customary before and the process of systems integration and supplier management proved more complex than anticipated. What Boeing lacked was "boundary jobs" – people whose role it is to manage the highly complex supplier ecosystem.

Boundary jobs

SLAs (Service Level Agreements) have started to disappoint. They don't provide the right level of quality, leading managers to compensate by recreating the functions that have been outsourced. Then the cost benefits obviously disappear. This is due to contracts that aren't as tight and explicit as they should be. It is also because companies are not defining boundary jobs well. These are the jobs of people interfacing with the external parts of corporate value chain. BP painfully discovered the need to properly define boundary jobs when its contractor Halliburton made an error on a deepwater platform in the Gulf of Mexico. Boundary jobs are complex to fill as they are both very technical, relying on expertise, and highly relational.

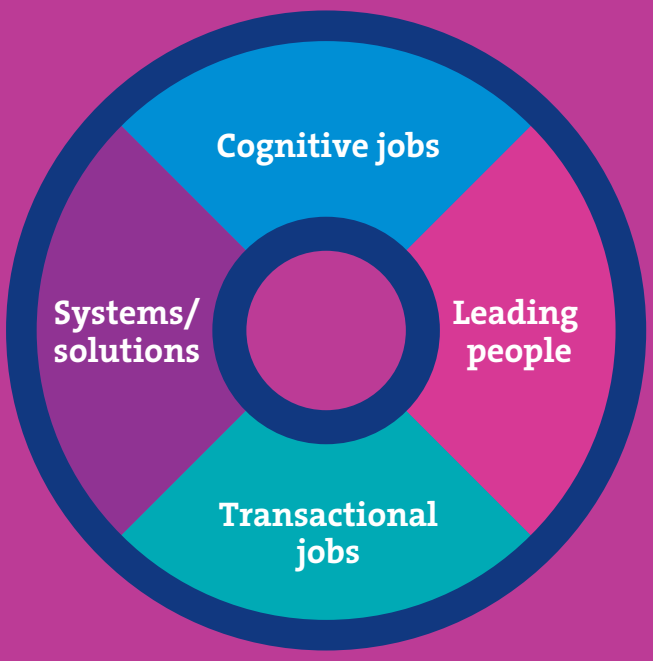
INTRODUCING THE BAGEL EFFECT

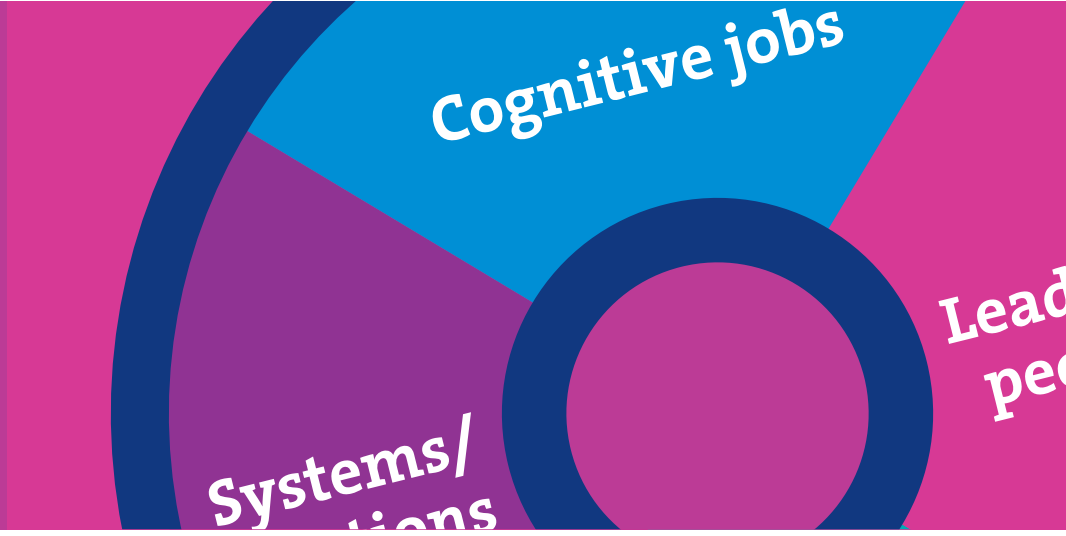
So while digitization removes a core of jobs forever, it also creates new roles. This is what we call "the bagel effect"; the emphasis on the new hot skills that will characterize the evolved modern corporation.

- **Cognitive** – the creative and intellectual skills needed to develop ideas, concepts and strategies
- **Systems/solutions** – the ability to operate effectively in a highly networked and collaborative environment and to make sense of data
- **Leading people** – leadership becomes even more important and more nuanced in the digitized world
- **Transactional** – dealing with other people (like customers, employees, partners, etc) is an essential skill when organizational structures and boundaries are more fluid

With the bagel effect, middle management doesn't die as many have predicted – it evolves.

It is possible to identify the particular hot skills that organizations will need to succeed as digital technology transforms its business. But doing this needs a radically different approach to analyzing and forecasting your workforce.





THE BAGEL EFFECT IN ACTION

In the 20th century, automation transformed employment in the car industry, creating a huge body of unskilled workers and a smaller cohort of managers and specialists before robots changed the production lines again.

However today, flexible manufacturing (the ability to create different models from the same production line) has shifted employment again. Premium manufacturers like BMW are experts at this, producing vastly larger ranges than before and creating new categories of vehicle. This has an impact on jobs in design, procurement, and sales and marketing, and means these areas now have to become more expert at selling to niche markets. This approach has created new categories of employment and changed the shape of the industry.

So tech-enabled flexible manufacturing transformed car manufacturing, which was once limited by volume and long production runs. At the same time it has shifted the nature of jobs rather than destroying them.

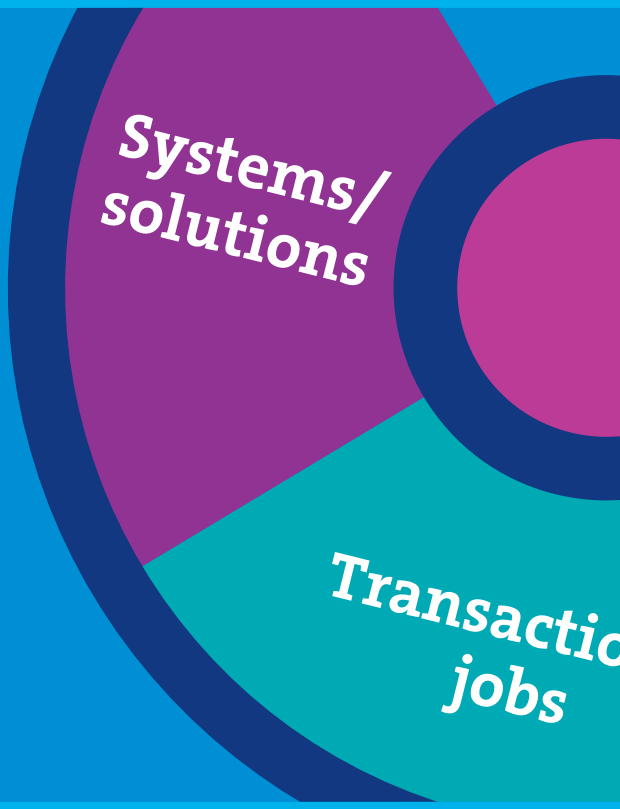
In television, technology has also brought about change rather than destruction. On-demand viewing, in the shape of streaming provider Netflix, made it possible for the makers / distributors of US series House of Cards to capitalize on the growing trend for marathon viewing sessions or "binge-watching" of high-quality TV shows. They financed and filmed an entire series, and then released all the episodes simultaneously. These new possibilities of digital distribution unblocked bottlenecks in the industry and cleared a path to new business models.

The pharmaceutical/life sciences sector is also in rapid flux as it seeks new routes to profitability now that the "blockbuster drug" business model has largely expired. Clinical trials – expensive, time-consuming and fraught with risk – are a major bottleneck to the development of new drugs and therapies, especially without the prospect of guaranteed future riches. Technology has the potential to transform this industry too, by mining data like medical records and health insurance data to augment and simplify the trials process and make it more cost-effective.

DEALING WITH THE BAGEL EFFECT

FOUR RULES CAN HELP YOU PREPARE YOUR ORGANIZATION FOR A DIGITIZED FUTURE:

1. Think in terms of solutions and systems integration
2. Focus on data and tech infrastructure
3. Identify the hot skills you need
4. Simulate for a fluid future



THINK IN TERMS OF SOLUTIONS AND SYSTEMS INTEGRATION

Who's in charge?
Exploration and production

Chart 1: Command and control structure

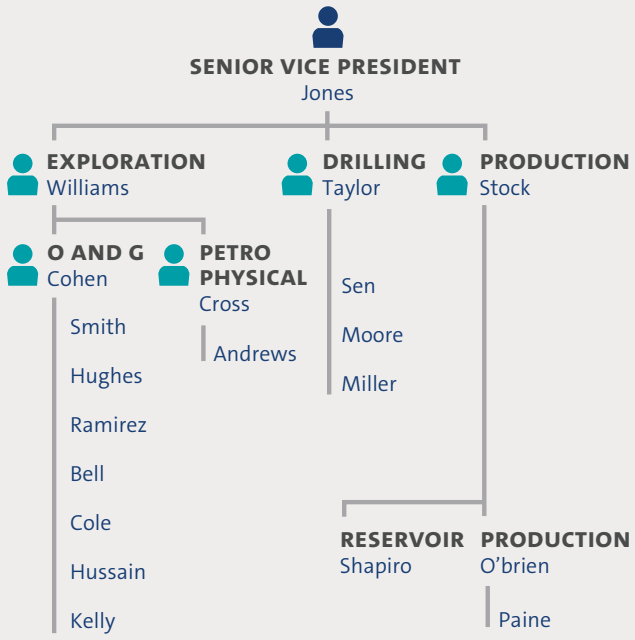
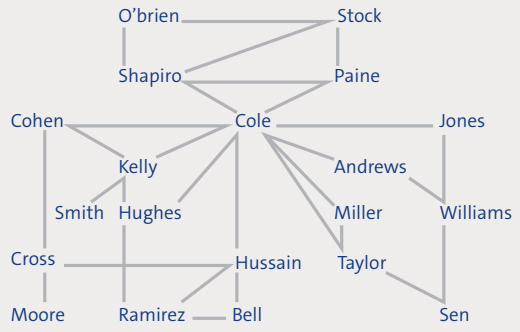


Chart 2: Networked structure



Most companies talk about providing solutions to their clients as a key strategic imperative. Beyond the cliché, it means they want to extract more value and more profits from their clients.

For example, vaccine manufacturers are responding in creative ways to the commoditization of their industry. They typically only capture $10 of the $100 value chain for a vaccination. In Brazil, Sanofi works with Santander to vaccinate employees and their families on-site, which adds value for the bank (a vaccinated employee is a happy, healthy employee) as well as giving the pharma company added branding and exposure, and more profits.

As we have seen, digitization drives a demand for different skills and different ways of thinking. This results in a rapid shift away from command-and-control and matrix organizations towards networked organizations.

This graphic illustrates the informal structures that exist within established top-down organizations – the networks of who actually interacts with each other, where advice is asked and who has influence. In this case, Cole, lurking in the Exploration department, turns out to be a highly networked influencer, while the senior vice president doesn't even seem to interact at all with two of her direct reports. It turns out that Cole is both a very knowledgeable expert and someone with high collaborative skills. Who, therefore, has the power?

Organizations that recognize the informal networks that drive them are better positioned for dealing with digitization. They can use these networks to evolve more quickly.

FOCUS ON DATA AND TECH INFRASTRUCTURE

Data is the raw material of the 21st century, its "black gold". Extracting it, refining it and turning it into useful insights and products is today's boom industry. It's been given massive added impetus by the "Internet of things", the plugging-in of everyday objects to the Internet.

Hitachi estimates, for example, that the "connected car", expected to be the norm by 2020, will generate 25GB of data every hour, with everything from telematics to engine performance, location and driver behavior coming out of its data exhaust[3]. Hidden within these huge data streams are insights that not only feed back into better products and marketing; they can create new value chains, for example by sharing usage and performance data that can transform car insurance (on a more controversial note, it will allow tax authorities to create pay-as-you-drive road usage fees).

Retail has always been a data-driven business. Big data dramatically extends what retailers can know about customers and trends. Link together purchase patterns with intent, sentiment and location gleaned from search and social media activity and mobile devices and you can better predict demand, set the best price and target customers with extreme precision[4]. The famous example of the US retail firm Target being able to determine that one of its clients was pregnant through her purchases is a powerful illustration. All of a sudden, a once-specialized business has kicked off a data analytics arms race.

IF YOUR INDUSTRY IS DATA-RICH IT WILL GENERATE NEW AND VERY SPECIALIZED TYPES OF EMPLOYMENT THAT NEED SKILLS YOU MAY NOT HAVE AT THE MOMENT.

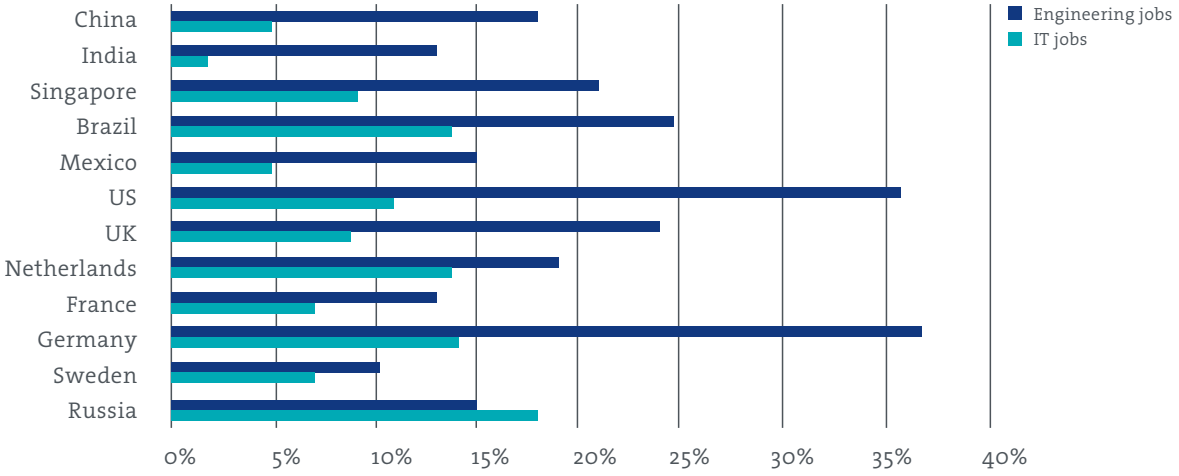
In short – if your industry is data-rich (and many are as the Information Age is finally coming of age) it will generate new and very specialized types of employment that need skills you may not have at the moment.

The same applies to companies with a lot of tech infrastructure. They induce rapid job evolution. The way companies like Airbnb, Facebook, Uber, TripAdvisor and LinkedIn have evolved illustrates how entire new categories can be created on infrastructure alone, without the need to create any "product" or content.

[3] http://www.hds.com/assets/pdf/hitachi-point-of-view-internet-on-wheels-and-hitachi-ltd.pdf
[4] http://www.slideshare.net/davidpittman1/big-data-in-retail-16163341

IDENTIFY THE HOT SKILLS YOU NEED

IT and engineering job scarcity



Your legacy workforce places limits on the strategic freedom of an organization.

There is often an assumption that people will simply adapt to any new strategy or organization change – but as the aircraft examples we have discussed tell us, history shows that this often doesn't happen. In some respects, the workforce behaves less like the well-drilled sports team of many managers' imaginations and more like a lava flow: moving inexorably in a particular direction. You can predict where it's going but you have to understand how fast it can move and what limits it.

Its speed of movement is a function of factors like hiring and firing processes, internal and external mobility and retirement. Its limitations are things like the competitive landscape, regulation and the bottlenecks in your industry.

See the workforce this way and it's easy to understand the challenge of making the huge shift from, say, broadcast TV to on-demand video content, or from traditional automaking to flexible manufacturing.

How, then, do you analyze this fluid yet inflexible capital asset to see what it can achieve? Two types of analysis will help you: defining critical roles and using HR analytics to identify the hot skills of the future.

Strategic roles are those roles that support the strategic capabilities needed to deliver your company's business model. For example, in the drive towards lighter cars, chassis engineers with a knowledge of carbon fiber are strategic, as are oenologists for wine companies.

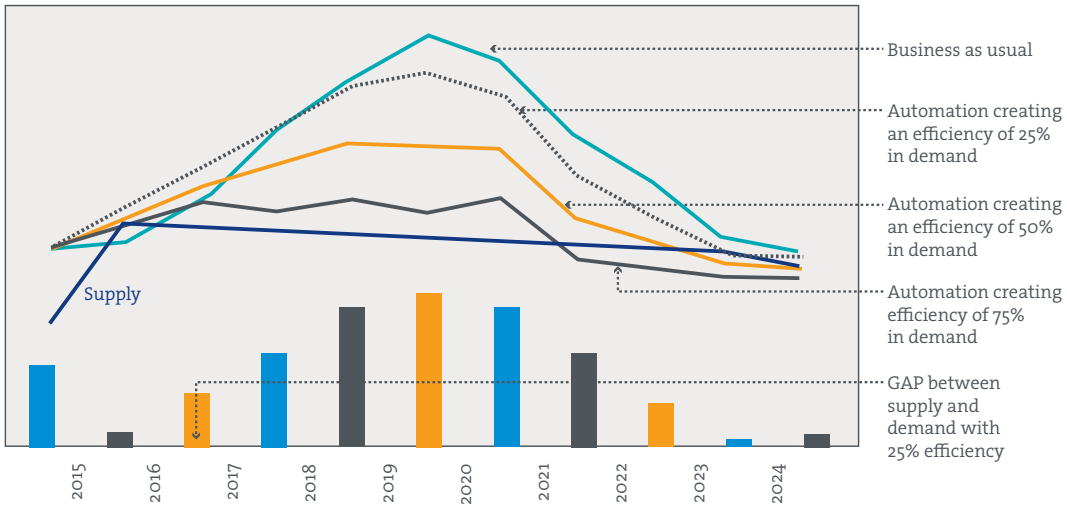
HR analytics allows for the rational, market-driven, identification of hot skills. Employee surveys can create heat maps that identify where departments are understaffed or overstaffed. Where pay is outstripping inflation, this points at hot skills, as does identifying jobs that can't be staffed. It's also possible to track how quickly job descriptions evolve and the speed at which new jobs emerge.

Sourced from our own data, the chart above shows the degree to which IT and engineering jobs are scarce in different countries. For example, Germany suffers from a shortage of engineers tempering the growth of its companies.

The combination of these strategic roles and scarce skills gives you insight about your company's critical roles.

SIMULATE FOR A FLUID FUTURE

The gap between supply and demand



This simulation helped a rail operator to model the impact of cross-training and automation in order to shape its future workforce.

Where are all the flying cars? Futurists of the 20th century imagined our city skies full of them. We're still waiting for this particular future to arrive, of course.

But what's relevant to digitization is that none of the future flying-car visions we may be familiar with – from Fritz Lang's 1927 film Metropolis to Luc Besson's Fifth Element seventy years later – thought to imagine how the cities themselves would need to change. Where are the landing strips and hangars, for example? The point is that when predicting the impact of new technologies, we rarely anticipate all the ways in which they bring about change.

This is where dynamic simulation can make a major difference. Feeding in the data and running simulations allows you to project multiple scenarios, giving you a far more accurate idea of what is likely to have an impact on your organization. Also, projecting the results over time means that issues with your data are more likely to be noticed, as the consequences will be more noticeable.

This is why when trying to decide on the workforce that will be needed in coming years, simulation provides better answers than extrapolation. Dynamic simulation has a significant advantage over tools like spreadsheets. Like a cash flow statement, it gives a better sense of how the business will evolve over time. Spreadsheets, on the other hand, are more like P&L statements, which simply give a static snapshot. The dangers of relying on spreadsheets is illustrated by the "London Whale" saga at JP Morgan, in which an error in a spreadsheet formula is thought to have contributed to the huge losses racked up by a rogue trader in 2012.[5]

With dynamic simulation, it's easy to see and change the model, and to link simulations to your own data warehouse to ensure planning is effective over time. It offers a strong competitive advantage in any market, but particularly in sectors that are changing fast.

[5] http://ftalphaville.ft.com/2013/01/17/1342082/a-tempest-in-a-spreadsheet/

TECHNOLOGY IS COMING TO GET US ALL. THAT'S THE ONE THING THAT ALL ORGANIZATIONS IN ALL INDUSTRIES CAN BE SURE ABOUT.

DIGITIZATION IS NOT JUST ABOUT JOBS. IT GOES TO THE VERY CORE OF WHAT THE MODERN CORPORATION IS ALL ABOUT.

PREPARING FOR THE FUTURE

Technology is coming to get us all. That's the one thing that all organizations in all industries can be sure about.

The savvy response to digitization is to recognize its potential to reshape rather than destroy your organization – and then to plan the workforce you need to succeed in the new reality.

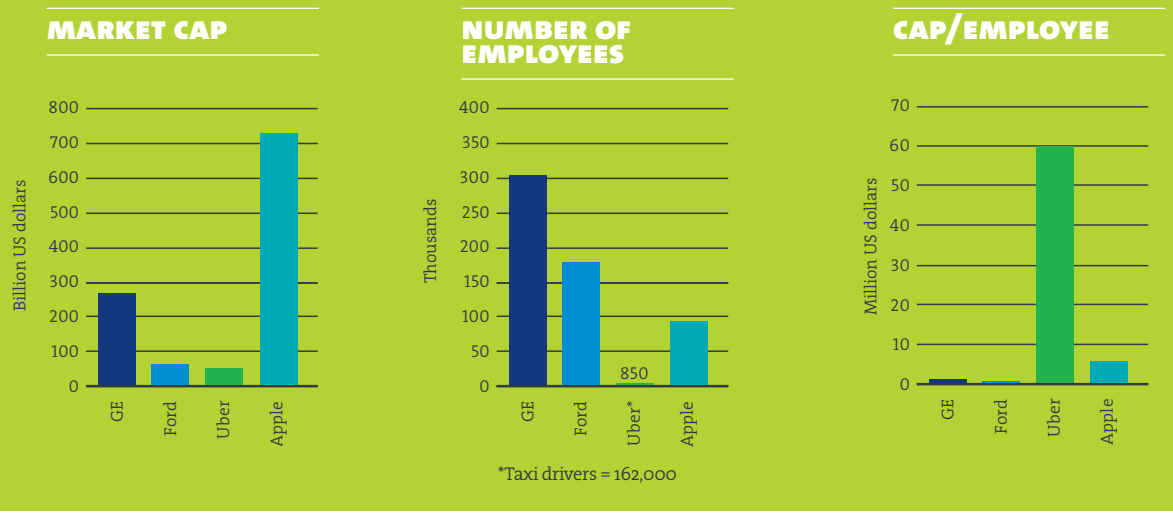
This means:

- Integrating the soft skills needed to support a solutions and systems-integration focus
- Taking an inventory of your current skills and identify the hot skills needed to support strategic capabilities
- Modeling the potential impact of technology to allow better use of data and infrastructure to remove bottlenecks
- Initiating a strategic workforce planning effort based on simulation tools to understand your legacy workforce and identify the first skills gaps

Afterword: the death of the traditional corporation?

Get ready for digitization using these steps and your organization will be well prepared.

Here's why it really matters: digitization is not just about jobs. It goes to the very core of what the modern corporation is all about. A quick look back through corporate history points to where the "bagel effect" could take us. It can be expressed in some simple statistics:



*Taxi drivers = 162,000

SIMPLE STATISTICS

Uber, the most extreme current example of a digitized company, creates nearly 10x more market cap per employee than Apple, at the moment the world's most valuable company. Apple, in turn, generates 10x more value by employee than traditional, yet excellent, firms such as GE or Ford.

Digitization is happening and won't be stopped. It is obviously a threat to many jobs and companies. It is also a major opportunity to strategically leapfrog your competition – as long as you can align the skills and talents of your organization with its fast evolving business model.

Using the four rules discussed above – the drive towards solutions, focus on data and infrastructure, hot skills and critical roles, simulating the future – you can prepare your company for the challenge of digitization and ensure you're not the hole in the bagel.

WANT TO KNOW MORE?

Get in touch if you'd like to know more about how we help organizations plan for future workforce change.

Visit us at www.haygroup.com

ABOUT THE AUTHOR

Eric Pelletier has been working in strategy consulting and in investment for 26 years. He is a thought leader for transformation in Hay Group and global director for Strategic Workforce Planning. He has extensive experience in helping Hay Group's clients develop innovative solutions to their business challenges, leading to large-scale transformational programs bridging human and financial capital.

ERIC PELLETIER
Global director, strategic workforce planning
Eric.pelletier@haygroup.com

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