# Monthly Newsletter

# INSIDE THIS ISSUE BUILDING A CAREER IN DATA SCIENCE

Data Science & Bl	2-5
ERP & Accounting Software	5-6
Technology	7-10
Economy & Politics	11-12
Environment	13

# UPCOMING EVENTS

# IFRS17 Program Update Forum

5th November 2019 Eight Members Club, Bank, London, UK

Registration: www.millenniumconsulting.co.uk/ifrs-17-update-forum

M | Millennium Consulting

## HOW TO START YOUR CAREER IN DATA SCIENCE

Millennium Consulting has a record of sourcing and on-boarding highly qualified technology professionals and Data Science is an area that has experienced significant growth in recent years. Given our experience and reputation in this field, we are regularly contacted by people requesting advice about how to start a career specialising in Data Science.

To provide answers to the most commonly questions asked, we interviewed Brendan Shaw, Head of Recruitment and asked him to shed some light on this topic. Brendan has 15 years' experience recruiting experienced people predominantly in finance and technology. Organisations he has worked with range from small commercial companies to large multi-nationals.



#### What is Data Science?

Most people have the impression that Data Science is all about machine learning, AI and deciphering code, however, this isn't the case most of the time. The misconception is due to most data scientists being initially hired by companies for analytical roles. In reality, Data Science is more about using data to create the maximum positive impact for a company or organisation. Data Science is a combination of Computer Science and data mining, which is defined by the Journal of Data Science as 'almost everything that has something to do with data: collecting, analysing and modelling.

From a target marketing perspective, the role of the Data Scientist is to obtain insight into products, create recommendations and use data to improve existing products. Designing complex models and data visualisations come way later in the list of priorities. Market research is a key aspect that requires the input of a Data Scientist. A Data Scientist can work through an extensive range of data and identify the factors that might improve the sales, or even forecast the demands and expected revenue of a certain product. How people react to certain advertisements on social media can be recorded and then interpreted to forecast the sales the product is expected to generate. Successful target marketing is a key reason why organisations often rely on data scientists these days.

#### What's the ideal path for someone who wants to embark upon a career in data science?

The first thing I would recommend is to study Statistics or Computer Science. Try and secure as many internships as possible, including unpaid. Taking part in real life projects is more important than what you learn through study. If when you've graduated you feel you don't have sufficient experience, attend training camps or take a role with a company that will allow you to develop your data science skills.

#### Do you need a Bachelor's degree?

In theory many companies say a degree is unnecessary. In reality though, I haven't interviewed or met any Data Scientists that don't have at least a Bachelor's degree. I often meet Software Engineers who don't have degrees because in such roles they focus more upon programming languages, however, for Data Scientists there is a greater need for mathematical knowledge. Without a Bachelor's degree, it's difficult to fully understand the scientific principals underlying it.

Whilst organisations with greater resources may have a better system in terms of work distribution and employ more people specialising in each aspect of data science, they generally prefer employing people with Master's or PhDs for more advanced and technical aspects, such as activity involving AI and rigorous machine learning.

I see many candidates with PHDs and Masters but if you have relevant experience, the qualifications don't matter quite as much.



# HOW TO START YOUR CAREER IN DATA SCIENCE CONTINUED

# to have a Data Science career?

If I had to choose just one, it would be statistics. As an all Is there high demand for Data Scientists? -encompassing subject it's perfect. I'm a believer in education, formal and informal. Additional subjects that Absolutely. Data science is growing much faster than are useful include computer science, software engineering, economics, statistics, mathematics and the sciences.

If you're thinking of gaining a Masters or PHD in data focus on. science, analytics, or any other field, because you love it, and you have the time and money to spare, that's great. But if your interest in analytics is driven by the desire for a role that offers better financial rewards than you have now, look for alternative paths to make that Machine career move. There are a vast number of career options in this sector for people with different skills.

#### What are the best programming languages to learn?

building up the basic infrastructure of a database. It is widely used by people employed in roles involving Business Intelligence. Knowledge of Python, R, Excel and When applying for any job you need to demonstrate Tableau is also important in order to develop skills in the potential to be the best in that category. If you are manipulating, visualising and interpreting data.

What matters more than technical skills is the ability to you are applying to be a data scientist, try and communicate and interpret the data in a better and easier way. In the end, it really doesn't matter which software you use as long as you are fast and effective in communicating and interpreting the findings.

# bootcamps?

Absolutely. Making the transition into Data Science can be difficult if you've never worked in the industry before. Bootcamps offer theoretical and practical applications using commercial data science problems from a range of different companies.

You can also apply to companies to work as a Data Scientist intern. This can help you prepare yourself for the real challenges you will face while working as a professional data scientist. If you don't have that option but have academic qualifications, bootcamps offer the opportunity to gain practical experience.

#### Are there any additional skills you should work on?

Developing strong communication and presentation skills is really important. Communication is crucial no matter which sector you work in. Within data science, the entire point is to communicate and interpret the findings that come through rigorous analysis. Improving

What is the best Bachelor's, Masters and PHD if you wish your writing and PowerPoint skills is important as well, as good presentation skills will help your career.

anybody anticipated, with a large number of data scientists needed. The industry is still trying to work out how to evaluate data scientist, in terms of who has the potential to excel and the perfect characteristics to

#### Would you classify machine learning is a subsection of **Data Science?**

learning focuses more on algorithms whereas data science focuses on data and insights, paired with algorithms to obtain final results. I would therefore personally classify them as two different roles, but others may disagree.

#### SQL is considered to be the easiest language for How can candidates gain a competitive edge when applying for internships or their first job?

applying to be a software engineer, try to show you have the potential to be the best software engineer. If demonstrate you have the potential to be the best data scientist.

This isn't easy as data science is a domain that people need to understand and are still trying to work out. Would you advise candidates to attend Data Science Data scientist need to love data and should be passionate about data. You should understand and be able to gain unique insights from data.

> Data scientists spend around 90% of their time finding, extracting, cleaning and transforming data and only 10% of the time pairing it with algorithms to obtain the final results. A data scientist needs patience to clean the data and the ability to debug it.

> These are all characteristic employers look for and areas you should try and build upon and demonstrate through the application process.

> If you are looking to progress your career within data science or are looking to supplement your team with experienced data scientists then contact Brendan Shaw at Brendan.shaw@millenniumconsulting.co.uk.



## PYTHON VS R

Python vs. R is a common debate among data scientists, as both languages are useful for data work and among the most frequently mentioned skills in job descriptions for data science positions. Each language offers different advantages and disadvantages for data science work and should be chosen depending on the work you are doing.

To help data scientists select the right language, Norm Matloff, a professor of computer science at the Machine learning Winner: Python (but not by much) University of California Davis wrote a GitHub post aiming to shed some light on the debate.

Matloff compared R and Python across the following 10 domains to determine which programming language was the better choice:

#### **Elegance - Winner: Python**

While this is subjective, Python greatly reduces the use of parentheses and braces when coding, making it more sleek, Matloff wrote in the post.

#### Learning curve - Winner: R

While data scientists working with Python must learn a lot of material to get started, including NumPy, Pandas and matplotlib, matrix types and basic graphics are already built into base R, Matloff wrote.

With R, "the novice can be doing simple data analyses standing of the statistical issues involved, Matloff wrote. within minutes," he added. "Python libraries can be R, on the other hand, was written by statisticians, for tricky to configure, even for the systems-savvy, while statisticians, he added. most R packages run right out of the box."

#### Available libraries - Winner: Tie

The Python Package Index (PyPI) has over 183,000 support for multicore computation, Matloff wrote. packaaes, Network (CRAN) has over 12,000. However, PyPI is rather workaround for its other issues, and R's parallel package thin on data science, Matloff wrote.

"For example, I once needed code to do fast "External libraries supporting cluster computation are OK calculation of nearest-neighbours of a given data point. in both languages," Matloff wrote. "Currently Python has (NOT code using that to do classification.)" Matloff better interfaces to GPUs." wrote. "I was able to immediately find not one but two packages to do this. By contrast, just now I tried to find C/C++ interface - Winner: R (but not by much) nearest-neighbour code for Python and at least with my cursory search, came up empty-handed; there was just R's Rcpp is a powerful tool for interfacing R to C/C++, one implementation that described itself as simple and straightforward, nothing fast."

When you search the following terms on PyPI, nothing has potential for enhancing performance and usability, comes up, Matloff added: log-linear model; Poisson Matloff wrote; however, the Cython and regression; instrumental variables; familywise error rate.



Python's massive growth in recent years is partially fueled by the rise of machine learning and artificial intelligence (AI). While Python offers a number of finely-tuned libraries for image recognition, such as AlexNet, R versions can easily be developed as well, Matloff wrote.

"The Python libraries' power comes from setting certain image-smoothing ops, which easily could be implemented in R's Keras wrapper, and for that matter, a pure-R version of TensorFlow could be developed," Matloff wrote. "Meanwhile, I would claim that R's package availability for random forests and gradient boosting are outstanding."

#### Statistical correctness - Winner: R (by far)

Professionals working in machine learning who advocate for Python sometimes have a poor under-

#### Parallel computation - Winner: Tie

The base versions of R and Python do not have strong while the Comprehensive R Archive Python's multiprocessing package is not a good is not either, he added.

Matloff wrote. While Python has tools like swig for doing the same, it is not as powerful, and the Pybind11 package is still being developed. R's new ALTREP idea also

spatial data; PyPy variants of Python can sometimes remove the need for explicit C/C++ Interface at all, he added.



## **PYTHON VS R CONTINUED**

#### Object orientation, metaprogramming -Winner: R (but not by much)

Though functions are objects in both R and Python, R takes that more seriously, Matloff wrote.

"Whenever I work in Python, I'm annoyed by the fact that I cannot print a function to the terminal, which I do a lot in R," he wrote. Python has just one OOP paradigm. In R, you have your choice of several, though some may debate that this is a good thing. Given R's magic metaprogramming features (code that produces code), computer scientists ought to be drooling over R."

#### Language unity - Winner: Python (by far)

While Python is transitioning from version 2.7 to 3.x, this will not cause very much disruption. However, R is changing into two different dialects due to the impact of RStudio: R and the Tidyverse, Matloff wrote.

"It might be more acceptable if the Tidyverse were superior to ordinary R, but in my opinion it is not," Matloff wrote. "It makes things more difficult for beginners."

#### Linked data structures - Winner: Python (likely)

"Classical computer science data structures, e.g. binary trees, are easy to implement in Python," Matloff wrote. "While this can be done in R using its "list' class, I'd guess that it is slow."

Based on the above criteria, R comes out on top in 4 areas compared to Python's 3.

When it comes to job postings, there is significantly less demand for data engineers proficient in R compared to those proficient in Python. According to a 2018 Cloud Academy report, nearly 66% of data science job postings mentioned Python, compared to just 18% of postings that mentioned R.

Outside of R and Python, other in-demand skills include SQL, Spark, Hadoop, Java, Amazon Web Services (AWS), Scala, and Kafka, according to Cloud Academy.

## **ERP & ACCOUNTING SOFTWARE**

## 6 TIPS TO HELP YOU SELECT THE RIGHT ERP SOFTWARE

#### 1) Select an ERP solution that meets the needs of your business

Understanding the needs of your business correctly will positively affect your choice. Before starting the ERP selection process, it is a good idea to analyse the business processes and identify areas that could be improved. Many systems offer a range of customisation options that can be effective in the management of future business processes.

#### 2) Make sure you have a realistic budget

Take care when assembling your budget plan. You may believe the most expensive option is likely to be the best, however, you should not adopt this view during the selection process but you should select the system which most closely meets the needs of your business.

#### 3) Future proof your ERP selection

When investing in ERP systems, businesses are expecting productivity, time and cost savings in their business processes. A system that cannot adapt to changing processes with developing technology may prove the opposite. Your system should be able to evolve as your business grows. Give priority to flexible and configurable ERP software. A system that allows you to make improvements specific to your industry can be an advantage. It is important that your ERP system is compatible with today's and tomorrow's technologies. You can maintain your success by using a system that keeps up with changing sector developments.

#### 4) Choose the right implementation partner

ERP selection is the first step down the digital transformation path but it is essential to work with a partner that can support you when you need to overcome difficulties and has a record of successfully managing similar projects.

# 5) Choose a system that is compatible with the other software you use

Your organisation is likely to be using other software and if you are satisfied with these applications and do not want to waste your investment then you should select an ERP solution that is suitable for integration with them.

# 6) Investigate ERP software that is commonly used in your market sector

Business processes and requirements of industry sectors differ. It is advisable to research the systems used by your competitors so you too can benefit by using industry-specific solutions.

If you follow this advice before selecting your ERP solution then you will avoid many of the pitfalls that exist. However remember that after selecting your ERP solution a long and challenging journey awaits you.

Get in contact with Millennium Consulting to discuss how we can support you.



## **ERP & ACCOUNTING SOFTWARE**

# INSUFFICENT CHANGE MANAGEMENT: THE PRIMARY CAUSE OF FINANCE TRASFORMATION PROGRAM FAILURE

The usual argument for finance transformation programs that incorporate automation and digital processing is they will allow the CFO to deliver better analysis and more meaningful information that will enable the organisation to make better, faster and more informed business decisions. However, finance transformation programs rarely run smoothly and often end up behind schedule, over budget and failing to meet their primary objectives.

Introducing new technology should provide the CFO with the tools needed to play an enhanced advisory role leading to increased shareholder value. ERP technologies promote a more cohesive less silo-based approach with greater collaboration between transactional finance operations, budgeting, forecasting, planning, reporting and analysis. Technical innovation can allow Finance to deliver greater value to the business and advanced analytics can measure and manage organisational performance and bring greater accountability.

During a finance transformation program, change management is not always given the priority it needs and its' true value may not be fully acknowledged. However, change management is a critical part of any finance transformation process as it can affect many people so it is advisable to ensure everyone involved in the change will embrace and fully support it. Collaboration and the ability to secure employee acceptance and buy-in are vital. Change programs run the risk of failure if there is insufficient communication and the change is regarded as being imposed by senior management without limited business involvement form the people who will be affected.

Effective ERP change management needs to recognise the impact of change from a broader corporate-wide perspective as it is likely to affect many areas including finance, IT, operations, marketing, sales etc. Initiating a clear and regular communication strategy with the impacted areas is essential to ensure they are kept informed and involved. Training is a priority so that those affected understand the complexities of the change and are capable of successfully operating the new systems and processes. A comprehensive communication program will help ensure change is accepted and will reduce the risk of unnecessary delay and resistance. Change management processes should involve creative marketing and communication between multiple audiences should account for human factors whereby emotions and their management play an important part in the change.

The move towards globalisation combined with technical innovation has led to an evolving business environment and the rise in digital and mobile activity and social media have had a significant impact upon business activity. With the business environment experiencing so much change, organisations have had to learn to accept and adapt to it. However, organisational change is often difficult as the structure, culture and organisational working practices are likely to be deep rooted and resistant to change and this highlights the need for effective change management.



# TECHNOLOGY HUMANS CAN LAND ON MARS BY 2035

Speaking at the International Astronautical Congress NASA Chief Jim Bridenstine has suggested that a Mars landing may be possible by the year 2035.

US Vice President Mike Pence, also speaking at the IAC, said that NASA's Artemis program, which aims to return astronauts to the Moon by 2024, is a stepping stone for an eventual mission to Mars. Pence added that the US is continuing to lead the world when it comes to space exploration and is keen to partner with other countries that share similar values.

"To be clear, our vision is to be a leader amongst freedom-loving nations on the adventure into the great unknown," the Vice President said at the conference. "The US will always be willing to work closely with like-minded, freedom-loving nations as we lead mankind into the final frontier."

The Americans are developing a spacecraft (Orion) and a mini space station (Gateway) that will remain in lunar orbit, which will in theory be used for a first crewed Moon mission in 2024, Artemis 3.

NASA is open to the idea of international participation in the Moon programme, which could lead to the first non-American setting foot on the Moon, someone maybe from Europe or Japan, possibly on future missions in 2027 or 2028.

At present Washington appears unlikely to build on earlier examples of post Cold War space co-operation as there is little appetite to work with geopolitical rivals Russia or China.

The prospect of a Mars landing seems to loom larger in America's space future. In November 2018, NASA announced that it had selected the location where its Mars 2020 Rover will land on the Red Planet. The rover is expected to reach the Martian surface in February 2021.

Although NASA's goal is to send a manned mission to Mars in the 2030s, Apollo 11 astronaut Buzz Aldrin thinks that a slightly later target date of 2040 is perhaps more realistic.

In an interview in 2016, Aldrin, the second man to walk on the Moon, said that by 2040, astronauts could visit Mars' moon Phobos, which could serve as a sort of stepping stone to the Red Planet.





# TECHNOLOGY FIRST ALL-FEMALE SPACE WALK

US astronauts Christina Koch and Jessica Meir have become the first all-female pairing to carry out a spacewalk.

NASA commented: "We want to make sure that space is available to all people, and this is another milestone in that evolution."

The first such mission was supposed to have taken place in March but was cancelled because the space agency had only one medium-sized space suit available for female crew. NASA's failure to be adequately prepared was denounced in some quarters as evidence of implicit and historic sexism.

Koch and Meir were working to replace a faulty battery charge/discharge unit, known as a BCDU. The station relies on solar power but is out of direct sunlight for much of its orbit and therefore needs batteries, and the BCDUs regulate the amount of charge that goes into them.

The US sent its first female astronaut into space in 1983, when Sally Ride took part in the seventh Space Shuttle mission and has now had more women astronauts than any other country. However the first woman in space was Soviet cosmonaut Valentina Tereshkova in 1963, followed by compatriot Svetlana Savitskaya in 1982, who was also the first woman spacewalker two years later.

The spacewalk comes as NASA plans to return to the Moon by 2024 with the Artemis mission, named after the twin sister of Apollo in Greek mythology, the goddess of the hunt. NASA's new Space Launch System (SLS), will send astronauts aboard the Orion spacecraft into lunar orbit. Astronauts will dock Orion at the Gateway, where they will live and work. The crew will take expeditions from the Gateway to the surface of the Moon in a new human landing system before returning to the orbital outpost. The mission will see the first woman to set foot on the lunar surface, and the next man (the 13<sup>th</sup>).

# **QUANTUM SUPREMACY**

Google is claiming that it has achieved quantum supremacy -- marking a major milestone in computing research. The company first made the claim back in September, and while disputed by competitors, Google's research paper has now been published in the scientific journal *Nature*.

Quantum supremacy is the ability of quantum computers to solve problems that current technology could not even begin to attempt. Google's paper explains how its 53-bit quantum computer -- named Sycamore -- took just 200 seconds to perform a calculation that would have taken the world's fastest supercomputer 10,000 years.



# TECHNOLOGY QUANTUM SUPREMACY CONTINUED

theory, this In capability opens future doors to technologies, such as designing better batteries and medicine, o r minimizing emissions farming from chemicals. It could also help to advance existing technologies AI and such as machine learning. However, Sycamore's feat has almost no practical use at this was stage -- it designed simply to show that a quantum computer could perform as expected.



Google CEO Sundar Pichai

Nonetheless, it is an important first step towards a technology that could have a major impact on our lives -- even if that impact is still some years away. Google CEO Sundar Pichai likened the experiment to the first flight by the Wright Brothers. "The first plane flew only for 12 seconds, and so there is no practical application of that," he said. "But it showed the possibility that a plane could fly."

Regular computers, even the fastest currently known to man, function in binary fashion: they carry out tasks using tiny fragments of data known as bits that are only ever either 1 or 0.

Fragments of data on a quantum computer, however, can be both 1 and 0 at the same time, harnessing some of the most mind-boggling powers of quantum mechanics to create exponentially larger amounts of information. These fragments are known as qubits, and due to their dual-state nature can drastically accumulate computing power.

Rivals IBM have described Google's claim as misleading and exaggerated, saying: "Quantum computers are not 'supreme' against classical computers because of a laboratory experiment designed to essentially implement one very specific quantum sampling procedure with no practical applications." They also believed that Google's 10,000-year estimate was an overstatement and based on erroneous assumptions.

Instead of 10,000 years for an ordinary supercomputer to match Sycamore's performance, IBM scientists claimed it would be more like two-and-a-half years using the most sophisticated traditional processors.

Other experts believe that we should be looking beyond quantum supremacy and more towards the capability known as quantum advantage, which will exist when programmable quantum gate-computers reach a degree of technical maturity that allows them to solve some, but not all, real-world problems that classical computers cannot solve.

It is unlikely that quantum computers will replace all classical computers. Many believe the long-term future of computing will be some form of hybrid between quantum and traditional machines.





# TECHNOLOGY ROBOCOP

Picture a world where police robots roam the streets dealing with crime, and I can pretty much guarantee you'll either think of a nightmarish all-powerful police state where everything has gone horribly wrong and/or *Robocop*.

But it turns out robot police are already here and it's nothing like either of those options: They just don't really care about citizens.

For those of you who missed it, Huntington Park, California added a new police officer to its squad; a robot actually named RoboCop.

At the time of RoboCop's unveiling, the city and police force were optimistic that the robot cop would be a real asset to the force, a hardened cop that stops at nothing to get the job done.

"HP RoboCop's capabilities are extremely impressive," City Manager Ricardo Reyes said in a statement. "In particular its ability to use its microphone to deter criminal activity and its mobility to patrol large open spaces."

"The police department is proud to welcome HP RoboCop as an official member of the police force," Police Chief Lozano also chipped in. "The extra help will definitely give the officers more time to focus on other community issues. I am confident he will fit right in."

And so, on June 18, RoboCop began patrolling public areas, in its unrelenting search for crime. Recently, RoboCop was finally put to the test when a fight broke out in the parking lot of Salt Lake Park, downtown Los Angeles. A witness saw the fight and immediately approached the robot with "POLICE" written across it in massive letters for help. When she pressed the robot's emergency alert button, she was expecting it to call the cops for help. It did not. Instead, it told her to get out of the way.

"I was pushing the button but it said, 'step out of the way,'" She told Reporters. "It just kept ringing and ringing, and I kept pushing and pushing."

While another witness, called the cops the old-fashioned way on his phone, RoboCop carried on its pre-programmed patrol route, occasionally stopping to tell people to "keep the park clean". Meanwhile, a woman involved in the fight was being carried into an ambulance with a cut on her head sustained during the incident.

Why no help from the robot, you may ask. Perhaps they have already turned on humans and are only interested in robocrimes?

Well, it turns out that RoboCop is in no way connected to the actual police. The calls instead go to the robots' creator, Knightscope, who leases the robots to the police department.

It turns out, the robots' cameras, which are capable of recording 360-degree high definition video and livestreaming it to police phones, are not connected to the police yet, nor are its abilities to read license plates and track cell phone use in the area. Police Chief Lozano told News that the robot is there on a trial basis, and will eventually be fully connected to the department's dispatch centre.

But for the moment if you see RoboCop you can be assured it doesn't actually do anything. It just potters around LA, tells citizens worried about crime to get out of the way, at a cost of \$60,000-\$70,000 a year.



## POLITICS

# BREXIT UPDATE: ONLY THE END OF THE BEGINNING

If Prime Minister Boris Johnson is able to persuade Parliament to pass his Brexit deal — to "get Brexit done," as he promised — it would seem to bring a successful end to the most difficult chapter of his career.

However it may only be the beginning of another time consuming and tortuous process to fully extract Britain from the European Union and build a new way forward.



The problem is that Mr. Johnson's deal with Brussels, while setting the terms of Britain's departure from the European Union, resolves few of the questions about the country's long-term future relationship with the bloc, its biggest trading partner. The government would have no more than a few months to settle those questions in a new trade agreement with Brussels, a process that typically takes years.

That means Britain could once again be staring down a cliff-edge like split from the EU in December 2020, when the Brexit transition period is to end.

Many experts doubt that all the necessary work to create a new agreement can be completed in such a short period of time.

That reality has dawned on many in Parliament, where lawmakers have already drawn up an amendment to Mr. Johnson's plan that could protect against an abrupt 2020 exit without a trade agreement by forcing a two-year extension of the transition period.

Such a change could however undercut the support of hard-line Brexiteers and end any hopes of passing a deal now.

The threat of a No Deal departure next year has already generated enough anxiety among moderate Conservatives that they refused to go along with Mr. Johnson's proposed timetable for passing his current plan, delivering the PM a defeat that has put his entire Brexit deal in limbo.

Theresa May's withdrawal deal protected against an abrupt split from the European Union at the end of the transition period. With her so-called backstop, the entire United Kingdom would have remained in a reasonably close trading relationship with the bloc past the end of next year.

That provision was anothema to most Brexiteers, and Mr. Johnson overhauled it, pointing Britain toward a harder split from the European Union. Under his plan, only Northern Ireland would keep close trading ties with the bloc, as a way of avoiding customs checks from taking place on the historically contentious Irish border. But apart from drawing up a new trade agreement with the EU at breakneck speed, or asking for an extension, Mr. Johnson's plan appears to offer no way to cushion Britain's departure from the bloc at the end of the transition period.

Mr. Johnson has argued in recent days that there is no risk of an abrupt departure next year because Britain will work out a new trade agreement on time that includes, for example, new tariff arrangements. But many experts believe this to be an extremely tall order in the time available.

It could take months for the EU to get a mandate from member states about its position in the talks, analysts have said, and then months more to prepare for negotiations with legal studies and impact assessments.



## POLITICS

# **BREXIT UPDATE: ONLY THE END OF THE BEGINNING CONTINUED**

Such negotiations are expected to be highly contentious. European negotiators would most likely demand that Britain commit to a "level playing field" with the bloc in areas like state aid, tax and social and environmental protection, effectively guaranteeing that Britain does not undercut European businesses by engaging in competitive deregulation.

Brexiteers are already fuming about Britain having to pay a £39 billion divorce settlement that covers the country's obligations until the end of next year. They will be aghast if they have to agree to pay more for temporarily maintaining trading ties with the EU beyond 2020.

Hard-liners have let slip that, in order to keep them on board with Mr. Johnson's deal, senior ministers have promised that Britain would leave the bloc next year even without a trade agreement. Hence the fears from the other side of the fence that the threat of No Deal has not completely subsided.

Mr Johnson still faces many difficulties in Parliament. His deal could be held up by amendments, including a proposal from Nick Boles that would force the government to seek a two-year extension of the transition period unless it strikes a new trade agreement or Parliament decides otherwise.

Such changes are so threatening to the PM that he has been pushing for an early election before he tries to push his deal through Parliament. But he faces difficulties here too in persuading his rivals to agree to bring forward an election.

Many believe that the fight over what happens next year is only a preview of the looming disagreements in Britain over its post-Brexit relationship with the European Union. While a Labour government would most likely seek a post-Brexit link via a customs union, the Conservatives have promised a more complete split. There seems little consensus, either in Parliament or among the electorate.

In many ways Brexit is a process that breaks down into stages, rather than a one stop, clean break.

Thus the spectre of a No Deal departure continues to hangs over the withdrawal process, if not now perhaps further down the line. Even when the withdrawal is confirmed there is still much to do to achieve a new relationship to replace the current one.



### ENVIRONMENT

# THE WINDS OF CHANGE BLOWING THROUGH THE ENERGY SECTOR

Wind power currently makes up just 0.3% of the world's energy – but as costs fall and green policies rise, it is on course to arow into a trillion-dollar industry that has the potential to provide sufficient clean electricity for every person on Earth 18 times over.

A major industry report by the International Energy Agency claims that global offshore wind capacity could increase 15-fold and attract around \$1 trillion of investment by as soon as 2040.

The IEA says this boom is being driven by the declining costs in installations, supportive government policies. An even more ambitious vision - in which government "remarkable technological progress" with and components such as larger turbines and floating hydrogen produced by offshore wind - could push foundations.

The report says the global offshore wind market grew. In this scenario, electricity generated by wind turbines nearly 30 per cent per year between 2010 and 2018. would be used to split water molecules into hydrogen There are now around 150 new offshore wind projects and oxygen atoms, with the hydrogen then being in development around the world, with China adding stored and ultimately blended with normal gas supplies more capacity than any other country in 2018.

"Yet today's offshore wind market doesn't even come close to tapping the full potential," the authors write. China is set to take the lead from the UK as the nation "With high-quality resources available in most major markets, offshore wind has the potential to generate more than 420,000 terrawatt hours per year worldwide. This is more than 18 times global electricity demand today."

But the agency says "much work remains to be done by governments and industry for it to become a energy goals could push that even higher to above 170 mainstay of clean energy transitions."

responses to environmental concerns are also major efforts are under way to reduce air pollution. contributing to growth in the sector, the report Offshore wind farms can also be built near many of the indicates.

In just 20 years, wind could become Europe's main The IEA said one of the most important technological source of energy generation.

Current offshore wind capacity in the European Union stands at almost 20 gigawatts, and under current policies, that is set to rise to nearly 130 gigawatts by 2040. However, if EU countries meet their stated carbon-neutrality aims, offshore wind capacity would jump to around 180 gigawatts by 2040 and become the United States and Japan," the agency said. Europe's largest single source of electricity, the IEA says.



policies drive an increase in demand for clean European offshore wind capacity "dramatically higher".

to heat houses or fuel vehicles. It could also be recycled to generate more clean electricity.

producing the most energy from offshore wind.

"By around 2025, China is likely to have the largest offshore wind fleet of any country, overtaking the United Kingdom," the IEA said. "China's offshore wind capacity is set to rise from 4 gigawatts today to 110 gigawatts by 2040. Policies designed to meet global sustainable aigawatts."

Growing awareness of the climate crisis and political The technology is particularly attractive in China, where country's major population centres.

> advancements in offshore wind is the development of floating turbines that could be deployed further out at sea.

> "In theory, [floating turbines] could enable offshore wind to meet the entire electricity demand of several key electricity markets several times over, including Europe,



www.millenniumconsulting.co.uk/green-agenda

# Millennium Consulting

IFRS 17 Progress Update Forum 2.00-6.00 p.m. Thursday 5th November 2019

Eight Private Members Club, Bank, London, United Kingdom Register at www.millenniumconsulting.co.uk/ifrs-17-update-forum

# Breakfast Briefing The CFO Challenge for Digital Finance, Modern Data Management & Analytics

8.00 a.m. Tuesday 26th November 2019

Eight Private Members Club, Bank, London, United Kingdom

For a full list of our upcoming events visit www.millenniumconsulting.co.ujk/events