BRICKENDON JOURNAL 14

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THE FUTURE IS ALL ABOUT TRANSFORMATION

THE CLOUD AND DATA

Is data privacy hindering the development of the cloud?

THE FUTURE OF DATA LIES IN ANALYTICS

Embracing analytics fully and with the appropriate tools opens up a world of opportunity.

ALSO IN THIS EDITION

- **DevOps:** the way to build quality software in a rapid, continuous and repeatable manner.
- **Disrupting regulatory reporting:** is it time for a commonly-owned solution?
- **Strategy matters:** a clear, communicable, business-aligned vision is paramount.

Data monetisation – it's about creating economic value, see page 19

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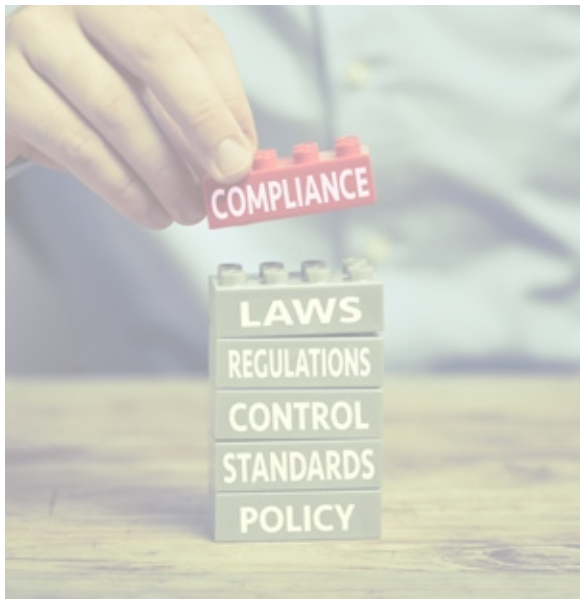
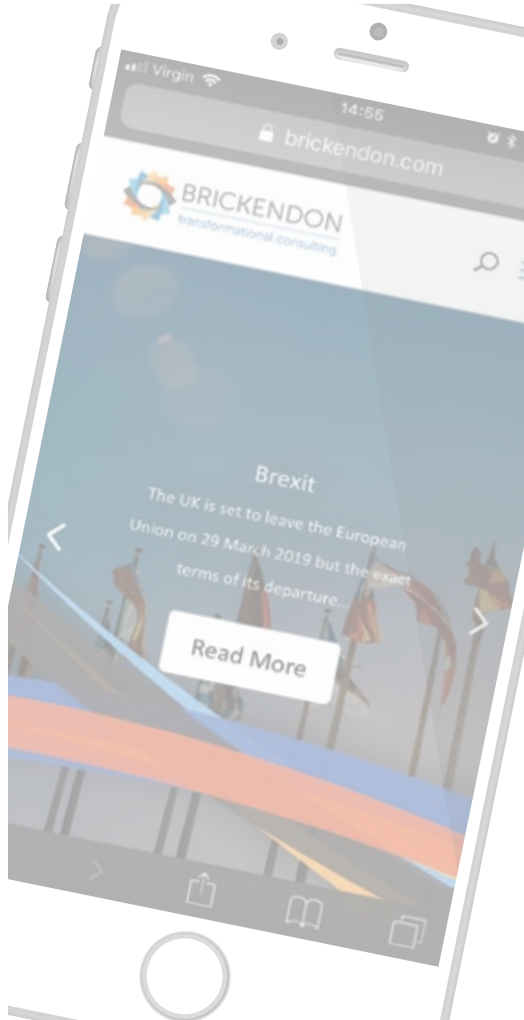




Christopher Burke, CEO and Founder
BRICKENDON CONSULTING

THE FUTURE IS ALL ABOUT TRANSFORMATION

The future is all about transformation. Whether it's the move from paper to IT, from simple data analysis to predictive analytics and Artificial Intelligence (AI), or ditching manual processes in favour of digitalisation, the key is to embrace the change.

Defined as a process by which one figure, expression, or function is converted into another, usually with the aim of improvement, transformation is the difference between surviving and thriving in today's highly competitive financial services world.

Take for example the switch from paper to IT. In the past, records, whether financial or personal, were kept in tangible form enabling referral to a hard copy for reference. Now however, Bill Gates' 1990's vision of the paperless office is becoming a reality, with vast stores of digital data housing reams of information, which can at will, be sorted by code, manipulated by analytics and governed by regulation.

The emergence of improved data analytics and AI is changing the way the data is used, enabling more precise analysis, which in turn leads to improved predictions and increased certainty for the future of your business. Over time, this analysis will become easier and cheaper for companies to use to their advantage. For example, accurate assessment of stock levels can be addressed, which in turn helps increase profits by maximising sales and eliminating waste. In addition, negative patterns of behaviour visible in staff, or problems with late-paying customers, can be addressed early to limit the impact on the business.

Clearer data supplies enable business leaders to make more informed decisions about outsourcing and how to strike the right balance between utilising in-house competencies and outsourcing commoditised functions. Optical Character Recognition (OCR) and machine learning mean that businesses can now afford to upskill smaller numbers of people at home, rather than an army of people in a lower-cost location. In fact, the increased use of technology directly by businesses means that many companies are now themselves becoming technology companies.

Going forward, Blockchain and Cloud also offer further opportunities. Blockchain has great potential in many areas such as transaction validation, reducing the need for reconciliations and fewer audit functions; while cloud, with its ability to drive down costs and scale in tandem, will further transform the financial landscape.

While this transformation to a more IT-based business model is without doubt essential for the progression of any business, it requires more than just a technical transformation. People and processes also need to transform, or be transformed, to enable the changes to be made. Many of a company's current staff will need to be retrained or replaced by highly technology-literate employees if the business is to remain relevant.

This is true for Brickendon and our experience in the digital product space. Not only do we consult on the latest ways to use technology to transform our clients, we live and breathe it in our own development divisions. This is incredibly exciting. In addition to the work we have done producing prototypes for our clients and then building bespoke versions, Brickendon Digital also builds its own products and offers them to clients via the cloud in a secure, encrypted, hosted environment. This hands-on approach ensures the products remain relevant and enables faster transformation of our clients' businesses.

One of the key enablers of business transformation, and a recurring hot topic at the moment, is the process of digitalisation - converting material or information into a digital form. This is required as a precursor to enable timely and detailed data analytics or indeed AI. Digital disruption provides a significant opportunity for those who have embraced it to increase their share of the market or enter new markets, and many that don't will be left behind or become obsolete.

The key, as with any new development, is to keep it simple and try not to do too much. Many firms try and conquer the world in one step and this is something to be advised against. Agile ways of working, which facilitate this approach, have proved successful at many of the world's largest technology companies. Take many small steps with targeted and properly assessed return on investment (ROI) and you will be on the right track to transform your business and ensure it is successful in this fast-paced but exciting era.

CLOUD COMPUTING
THE WHAT, WHERE, WHEN AND HOW?

By Nikit Kothari, Executive Director

The use of cloud computing has been gaining some serious momentum in financial services in recent years. With an increased focus on cost efficiency, continuing to deliver against a very aggressive technical roadmap has become the norm in our current financial environment. Revenues are now growing based on the ability to implement new technology, as well as provide cutting-edge solutions. Although cloud computing has been around for over a decade, its success can now begin to be measured thanks to its adoption by large financial institutions. As a result, its use will rapidly evolve and start to shift the landscape in which it operates. To get a better understanding of the concept, let's start from the beginning.

Cloud – the beginning

In 2006, Amazon formally established the Elastic Compute Cloud, effectively offering virtual computers from which users could run their own applications. Being able to provide these virtual machines provided opportunities to reach high-capacity networking in locations where clients didn't have an expansive footprint. This was one of the early drivers for adopting cloud computing across the technology world.

Financial services footprint

While technology giants such as Amazon, Google, Microsoft and IBM (to name just a few) were focusing on the beginning of the new cloud technology, the financial services industry was experiencing an extremely bullish environment where revenues and profits were at all-time highs. As a result, global markets technology teams needed to quickly deliver software to address the needs of both the clients and the banks. The technology teams had their own grand plans with strategic visions and large-scale initiatives, but as the profit of a deal was the main priority, these short-term projects were staffed and approved

immediately without any thought for the long-term IT strategic vision. This type of short-term view led to:

- non-scalable applications,
- a lack of appropriate controls,
- manual short-cuts and work-arounds, and
- increased IT costs.

This practice was considered Business-As-Usual until 2008.

Enter the financial crisis

The financial crisis not only had a lasting impact on the global economy, but also served as a catalyst in the industry to change the way banks operate. The introduction of large-scale regulations around capital restrictions followed by Dodd-Frank and stress-testing was just the beginning. There also needed to be a change in how technology was used to cope with these changes. More specifically, there needed to be a shift in the perception of technology away from it being simply back-office support, to that of a more strategic business partner.

With the financial crisis came large drops in revenue and an increased focus on reducing costs and establishing controls. With its high overhead costs and a pre-crisis short-term view, technology became an obvious area of focus. This is the point when cloud computing began to firmly take shape as an area for investment.

Cloud computing in financial services

Global Financial Services organisations have historically faced challenges due to the high demands and expectations of their customers. Traditionally, a customer's personal relationship with their banker kept them from shifting their business to competitors. However, because the market had shrunk so drastically, customers could no longer solely rely upon this relationship. Adapting to these new customer attitudes required a monumental change in the way banks managed their infrastructure and cloud computing was well-placed to become a key component of this change. However, compliance added an extra burden to this shift. Some particular areas of concern were:

- IT security,
- data privacy and security,
- reliability, and
- robustness.

Which cloud: private vs. public vs. hybrid

As cloud-based technologies developed, three distinct versions came into being:

1. the private cloud, an on-premises version of the cloud managed by the firm's IT team,
2. the public cloud, which is hosted by a private third-party, and
3. the hybrid cloud, which is mix of the private and public clouds.

Due to concerns raised mostly by regulators, most financial institutions determined that creating a private cloud within their internal environment, that sits inside the company's firewall along with their existing infrastructure, would be the best option initially. This way, the majority of the early concerns about the cloud could be mitigated, and costs could be flat as it was managed by the existing IT teams.

> "The key is to ensure the software is scalable, secure, resilient and compliant"

Private cloud infrastructure started early, with the adoption of Remote Desktop Services and then Virtual Machines and VDI. The reduction of costs associated with moving from traditional desktops to this model created a more simplified working environment with the allowance for flexibility. Another knock-on benefit of having a flexible work environment, was that resources did not need to be based in high-cost locations. Enabling remote working reduced employee costs and created real-estate efficiency through hot-desk locations. This use of the private cloud migrated into the software development environment. When developers were creating applications, approvals to begin work were given promptly if the software was going to be on cloud-based infrastructure.

However, all this rapid growth and demand on the private internal cloud caused a massive strain on the internal IT infrastructure teams: data centre space was reaching its limits, procurement time for cloud-based hardware was taking the same time to deliver as traditional hardware, and IT teams were at maximum capacity to help support this new and evolving model. Seeing as banks were not getting all the benefits they had hoped from the private cloud, the public cloud started to look like a more exciting offering. It had the benefit of using the same infrastructure, but over the public internet, which was available to anyone that was willing to pay a fee. The primary benefits of the public cloud was that the need to manage, maintain, and procure hardware shifted from the banks to the cloud-service providers. Additionally, the ability of the banks to scale-up quickly without having to buy, install and configure new servers significantly reduced costs, and also provided a faster time-to-market. Finally, having a variable or "pay-per-use" model allows for increased flexibility in spend, as compared to the normal fixed price model, which allows teams that are budget conscience to be able to scale for what they are using. While the private clouds were growing, the public cloud was taking significant strides to help improve the banks' infrastructure, whilst addressing the concerns posed by the regulators.

Finally, as the need for cloud computing has increased, regardless of whether public or private, firms have started looking into the feasibility of a hybrid cloud model. This enables both the private and public clouds to be used together by shifting workloads from one to the other. A combined offering that keeps information safe and secure, but also has the ability to expand and use burst capability where necessary, the hybrid cloud has become an extremely attractive option.

Whichever cloud service you decide to use, the key is to ensure the software is scalable, secure, resilient and compliant. As with any transition or new development, sufficient research and preparation needs to be carried out to ensure you have the right service to achieve your desired goal.

See our website www.brickendon.com for more details.

STRATEGY MATTERS, ESPECIALLY WHERE TECHNOLOGY IS CONCERNED

By Geoff Cooper, Director

Strategy is important regardless of whatever area of financial services you're in, but it is frequently not well thought through, particularly when it comes to technology.

An unclear strategy can lead to all sorts of problems, including misinterpretation and the inefficient deployment of resources. An incommunicable strategy will cause valuable time and resources to be wasted on translation and clarification, and a strategy that is not business-aligned, will fail to deliver the desired results. So why then is technology strategy often ignored? Most likely due to innovation and a failure to embrace the changes it brings.

Innovation is fuelling the evolution of the technology world, not only driving change in how technology is delivered, but also changing the careers, roles, and responsibilities of the people who deliver it. Developments and processes are often so nascent that strategy goes out of the window. Tried and tested frameworks, processes and methodologies for devising, executing and governing business strategy are ignored and Chief Technology Officers (CTO), who have often followed an unconventional path to get to the pinnacle of their career, fail to acknowledge the importance of proper planning, execution and governance.

Formulation of strategy

So how should this issue be addressed? There is no doubt that a clear, communicable, business-aligned vision of the future state is paramount to the successful execution of technological strategic plans. Corralling a broad set of potentially conflicting business requirements, technological innovation, people leadership, financial justification and risk management is no easy task. Transforming that into a strategic plan which all stakeholders will sign up to is even more difficult.

Technology must be run like a business, with customers, product development, marketing, finance and operations all combining to make a successful strategy. In the same way, strategic business analysis tools, such as SWOT Analysis or Porter's 5 Forces and Value Chain, can be used to help formulate the technology strategy.

Vision

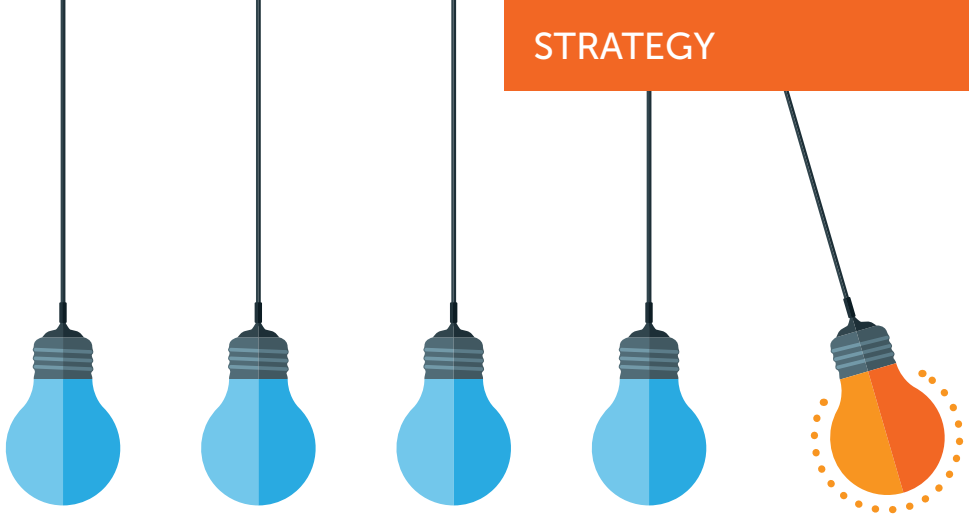
The output from such tools enables the management team to understand the current state and key initiatives to be highlighted and prioritised. Ultimately, the management team needs to formulate a plan with options that are not overly complicated but can adapt appropriately within a given time horizon.

For a strategy to be clear, the end-point or vision also needs to be clear. Whilst its distillation may be a complex process, a strategic vision that is clear, easy to understand and easily communicable across the organisation is far more likely to succeed. Sometimes, vision and mission statements are confused. Simply put, vision is the future state and mission guides how to get there.

Strategic influences

There are a series of strategic influences such as business alignment, innovation, architecture, communication and values, which can significantly impact the implementation of any strategy.

A strategic vision aligned around cost leadership and product differentiation with



appropriate and clear goals makes a healthier business. As already mentioned, innovation is a critical component of any successful strategy and given that technologists generally strive to find new ways of doing things, new processes or products will regularly feature in evaluations of the strategy and strategic progress. Innovation is also a disruptor and its impact should not be ignored. Architecture, and more specifically Enterprise Architecture (EA), also takes a leading role in shaping the future state of the business. With the increased dependency on digital platforms that support the customer experience end-to-end, EA helps define how people, processes, information and technology will be organised to support the future state.

Moreover, strategic progress and success (or failure) must be communicated if the message is to be believed and continuously supported. Too often a grand plan is communicated without subsequent updates.

Strategy into execution

Having decided on the optimal business strategy, the focus pivots to transforming it into an executable plan. Some helpful techniques

> "Innovation is a critical point of any successful strategy"

to assist with documenting and communicating the plan include workshops, roadmaps and the Agile visualisation tool Kanban.

Other useful facilitators are SAFe, a framework to enable the delivery of Agile practices in larger enterprises, and LeSS, a software delivery practice that enables many teams working on one product to deliver using Scrum methods. Portfolio & Programme Management (PPM) execution methods also help support strategic execution when roadmaps and dependencies are clear. The CTO will need to decide how invasive any new methodology needs to be and how it will integrate with existing methodologies across the wider enterprise.

One advantage of traditional methods of PPM is that responsibility for delivery is clear. In newer frameworks such as SAFe, responsibility is delegated across the team, which requires a fundamental shift in trust and the way teams

work. This is the same for DevOps, a progeny of Agile development practices, which as well as encouraging a more collaborative approach also reduces running costs and produces a more industrial, scalable application.

Execution guided by governance

Governance basically provides the organisation with a conscience. When designed, measured and executed well, it can provide valuable inputs into the strategic execution. When not fit-for-purpose, it can create tension, slow down delivery and be expensive.

Running technology like a business implies the existence of financial management and controls, which enable the organisation to understand the cost and value of any technology stream. Financial management provides transparency and enables effective decision-making, prioritisation, change and accountability. Without it, firms will make the wrong choices, focus on the wrong things and ultimately lose money.

Some options for optimising costs are

> "Having a business-aligned, well-communicated framework in which to develop the organisation's technology strategy can be the difference between thriving or just surviving"

to create shared services, standardise procedures, use the cloud, adopt zero-based budgeting and where appropriate, re-evaluate the location strategy.

Location strategy

Although not always recognised, location strategy is an important part of the overall technology strategy. Getting the right people at the right price at the right time in the right location can save businesses time and money. Increased cultural diversity also brings new ideas to the team and can be particularly beneficial in a creative environment such as application development.

It is however not without its challenges. Roles and responsibilities (particularly in global coverage situations) need to be explicitly defined to avoid gaps or expensive overlaps or damage to the customer experience.

The future

As we have seen, technology strategy is not something to be ignored. Having a business-aligned, well-communicated framework in which to develop the organisation's technology strategy can be the difference between thriving or just surviving. After all, innovation is here to stay, and failing to embrace it and the benefits it brings, is simply not an option. Now is the time to take technology strategy seriously.

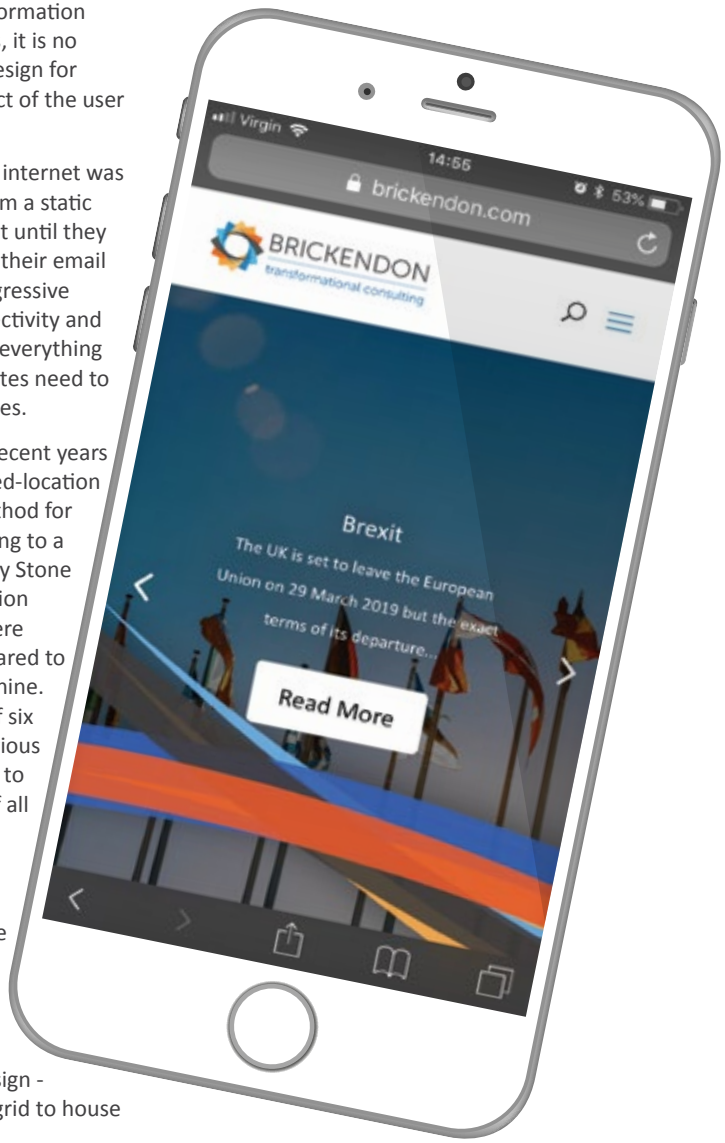
RESPONSIVE WEB DESIGN – WHY IT PAYS TO GO MOBILE FIRST

By Christopher Burke, CEO

In a world where everyone is incredibly busy, and customers expect information to be available at their fingertips, it is no surprise that website and app design for mobile devices is a leading aspect of the user experience (UX).

Once upon a time, access to the internet was limited to the home or office from a static site, which required users to wait until they arrived at that location to check their email or purchase an item. Today, progressive technology, better mobile connectivity and the need for greater flexibility – everything on-the-go - means that all websites need to be able to adapt to mobile devices.

If we look at current figures, in recent years mobile access has overtaken fixed-location web access as the preferred method for viewing online material. According to a study by digital marketing agency Stone Temple, 63 per cent of the 2 trillion visits to online sites in the US were made on a mobile device, compared to 37 per cent from a desktop machine. This 63 per cent is an increase of six percentage points from the previous year and a figure that is forecast to increase to at least two-thirds of all traffic by the end of this year.



Responsive web design

It is in fact rare today not to have a mobile website. However, if you find yourself in a position where you need to optimise one, it isn't hard to achieve. It's all about responsive web design - the process of designing a fluid grid to house your content elements. A traditional desktop-only website will show everything in fixed sizes, known as pixels. With responsive web design, the content is designed to render in relative units, dependent on the device.

Mobile-first strategy

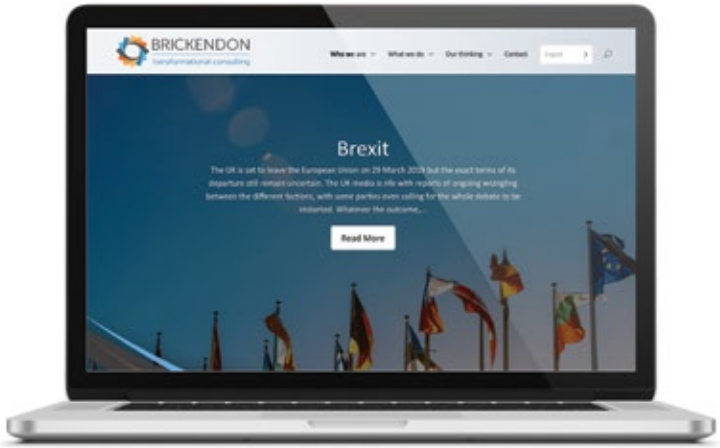
Given the shift in internet traffic away from standard desktop usage to more of a mobile-orientated approach, many firms are adopting a 'mobile first' strategy when it comes to web design. This prioritises the development of a mobile-friendly design for two reasons: firstly, because of the increasing importance and popularity of mobile internet, and secondly, because designing for the smaller screen is a more complicated process. By focusing on the development of the mobile-friendly programme first, developers are able to tailor their content for the smaller device, thus enhancing the experience of the user, and ensuring they can achieve what they want easily. This process is much harder if the larger desktop site needs to be shrunk to fit the smaller format. Designing the mobile site first also has the advantage of simplifying the processes online.

For example, designing a form that can easily be completed using simple finger taps and radio button selection (radio buttons are visual elements, i.e. empty circles that once clicked become filled on the screen and enable the user to make one sole selection from a pre-defined list of options), rather than large dropdown menus, often makes you think a little more about what is really required. Keyboards can be fiddly on mobile, so again, when looking at data entry, focusing on the mobile site first ensures you challenge whether all of the fields are really required to allow a user to complete their task.

User experience

Today it is common for a UX team to design three templates: mobile, tablet and desktop. All three will have similar elements that can be adapted depending on the required screen size. This ensures that the developers focus on what the user really needs to see, rather than simply loading the full desktop site with anything and everything that a business stakeholder may want on there. The sensible approach is to cover all three, as the nuances can be important once fully developed. However, depending on the site and amount of content you have, all three may not be necessary.

This process of careful selection and decision-making at an early stage can often lead to challenging conversations. These can be made simpler by using other mobile-first sites as examples or by initiating user-based testing during the design process. This is where you test your screen – layout, flow and appearance - on actual customers and get their feedback from the very start of a project. As a result, you know what you're doing right, where you're going wrong, and all being well, can correct these issues to produce a much better customer experience for your users.



CAN CLOUD COMPUTING SURVIVE DATA REGULATION?

By Nikit Kothari, Executive Director

Data globalisation challenges

The advent of big data and the cloud was supposed to make distributing applications and data easier for global banks. A key selling point was to have a single location from which to run applications and store data which would make the process cheaper and easier. However, data protection and privacy regulations such as the General Data Protection Regulation (GDPR), the Australia Privacy Act and the Japanese Personal Information Protection Act have thwarted those promises.

Instead, global banks need multiple environments based on country or regional requirements, or a hybrid cloud approach, in which to store their data. Add to this the complexities of implementing a global data management programme, and a recipe for disaster is in the making.

Globalisation versus localisation

From a data perspective, the goal of the cloud is data globalisation, where users are given access to a golden copy of data regardless of where they are located. However, in reality, due to the obstacles being imposed by many countries, data localisation is occurring. This is where a combination of multiple on-premises and cloud environments are set up to store the data. Due to these multiple instances however, uncertainty is created around the quality and accuracy of the data which reduces the data's credibility.

Tight controls on personal data

In theory, the data protection and privacy regulations are supposed to create tight controls on flows of personal data outside their respective countries through requirements such as data centres needing to be located inside each country. However, this fails to recognise that the physical location of the data has no inherent impact on privacy or security. For example, if a bank is subject to European laws (e.g. GDPR), then the privacy risks of storing Europeans' data inside the EU are no less than those of storing it outside. The bank would still have to treat the data according to the rules of GDPR. These types of data-residency requirements create inefficiencies in technology infrastructure.

Regulations shackle AI

Such country/region-specific regulations, which result in data localisation, are being introduced at a time when global banks are actively pursuing machine learning and artificial intelligence (AI) capabilities to boost productivity. The governments creating this environment need to understand that these regulations will come at a significant cost in terms of stifled innovation and productivity.

For machine learning and AI to be successful, organisations need access to vast amounts of data. Regulations that overly control the use of data, in effect, shackle AI. The core economic value of AI lies in its ability to automate complex processes, de-risk data environments, and increase the quality of the data output. The act of localising data will make it much harder for the banks to reap the benefits promised by AI.

Implementations become fragmented

Another issue created by regulations is

the fragmentation of implementations. As noted above, many new cloud-based infrastructure strategies have a very region-centric or country-specific flavour. This causes implementations to become fragmented and limits the true benefits of data globalisation and cloud implementations. For example, housing data behind a firewall in a country-specific data centre creates a massive burden on the central infrastructure teams due to the significant maintenance and support costs. It is, in essence, the exact opposite of why cloud computing came about - to enable databases or applications to be set up wherever or whenever they were needed.

Regardless of where the data is physically located, the treatment of the data must go through the appropriate processes and controls and be subject to the required level of security. If all this happens, then the need for data to be stored in a particular country or region is mitigated.

> "There needs to be an understanding of what data truly needs to be localised"

Data virtualisation layer

This is where the data virtualisation layer comes in. It's a concept that, when implemented appropriately, allows one single point of connectivity to obtain all the data required by the consumer. Having specific regulatory and privacy requirements, as well as entitlement-based ownership, needs to be at the forefront of design when determining a true implementation methodology. Regardless of whether the data is sitting on a public or private cloud, or a mix of both, a single point to access this data will create efficiencies. Once the core data virtualisation layer is enacted, and the treatment of the data can be managed via user and system entitlements, then the need to have distributed data stored across different regions becomes immaterial.

Finally, there needs to be an understanding of what data truly needs to be localised and why. For example, if specific data doesn't need to be localised instantaneously, but does need to be available at the end of the day, it could yield one type of data storage need, while the intraday access and cache of data would yield a different requirement.

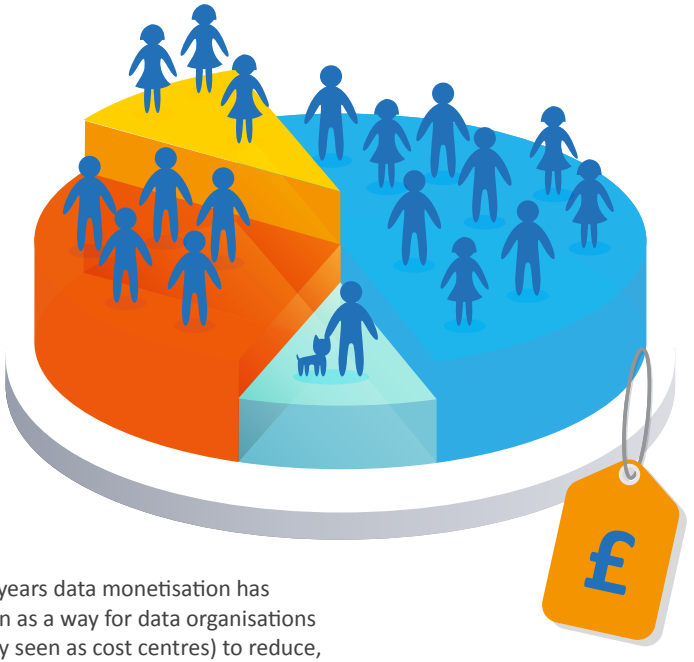
Increases to security environments

Public cloud onboarding has really only just begun in the financial services industry. The original implementation strategies and intended use of the cloud has already changed from the very early days and it should be anticipated that there will be significant changes to the environment in the foreseeable future. Increases to security requirements are inevitable, as is the ability to access the data in more sophisticated ways. Additionally, as regulations become more mature, there will be even more changes to how data use is monitored and measured.

There is no doubt that the use of cloud computing in financial services will continue to grow at an exponential rate. New cloud-based architectures will create efficiencies and innovations and allow firms to grow. However, none of these efficiencies and innovations will happen unless the regulations start to align with the technology and allow for data globalisation.

THE PERILS OF DATA MONETISATION

By Nathan Snyder, Partner



For many years data monetisation has been seen as a way for data organisations (traditionally seen as cost centres) to reduce, or at least justify, their expense. By assembling data and then selling it either externally to third-party vendors, or internally within their own company, a data organisation could recoup some of its costs. This is, however, not an endeavor to be entered into lightly.

To be clear, data monetisation is not simply another name for selling personal data. It is a way of creating economic value for the firm holding the data, with the aim of either increasing revenue or decreasing costs. However, due to the large amount of publicity currently surrounding personal data and its uses, particularly in the light of the recent Facebook-Cambridge Analytica scandal, the public perception is that if a company is monetising its customers' data, it is selling it on to be used for other purposes.

Monetising customer data is however not a new phenomenon. Companies have been doing it for years, even before the advent of social media. Take, for example, the first time an advert popped up on a news website for a niche product you had just conducted a Google search for, or looked at on the online retailer Amazon's website. "How did that get there?", you may have asked yourself. The answer is that Google or Amazon provided the advertisers with your search history, enabling them to target you specifically. This use of collected consumer information, which has been taking place for many years unbeknown to lots of consumers, is a form of artificial intelligence (AI) that helps advertisers improve their target marketing.

Customer data

Since the dawn of advertising, companies have tried to hone their message to ensure it gets to the right people. While the classic quote: "I know that half the money I spend on advertising is wasted, I just don't know which half", still holds true to some extent, the vast amounts of data available and the high levels of analytical capability, provide the opportunity to significantly reduce waste.

However, there has recently been a shift in public perception surrounding the practice of collecting and using personal data. Consumers have become picky. They want Amazon to tell them things like: 'customers who viewed this item also viewed…' and Netflix to make 'knowledgeable' programming recommendations based on what has been watched recently, but they are not so keen on the information being passed on to third parties. New reports suggest that Amazon is seeking to take yet more control of our lives by adding more devices, such as smart microwaves and fridges, to the Alexa that already sits in many kitchens. The question remains though as to whether by embracing these items, we are agreeing to give up our data? After all, the new General Data Protection Regulation (GDPR) in Europe and the increased demand for personal data protection in the US, mean that businesses need to be more careful about what information they provide to whom and ensure their customers are aware if their data is moving outside the organisation.

Data privacy concerns

The aim of GDPR is to protect the consumer and their data. It lays out a legal framework to govern the way companies handle data generated by EU citizens and aims to empower individuals to make informed decisions about the data they generate. Under the terms of GDPR it is the responsibility of the company holding the data to collect, store, process and dispose of it correctly and legally. Both Europe and the US have previously had data privacy and protection rules, but not actual laws punishable with financial penalties. GDPR is much more stringent, with fines for non-compliance of up to €20 million, or 4 per cent of global revenue.

AI and machine learning

So, what does this mean for AI, machine learning and predictive analytics? There is no doubt that the new rules for collecting, storing and using customer data will make it more challenging. The concepts of AI and machine learning are based on the premise that there is lots of data available from which to run complex algorithms. If an organisation is not able to access a customer's buying history to predict their future needs, what will the machines use to learn? This is not to suggest that data privacy, and more specifically GDPR, means the end of machine learning and AI. It will just become more difficult to provide services that the public appear to want (given the amount of money that companies like Amazon, Apple, Google and Microsoft have already spent, and are still spending, on it).

The key will be to correctly understand what level of privacy the public is prepared to give up in order to get what they want from their technology and ensure that this fine line is not unknowingly crossed. Will consumers for example, be willing to give Amazon access to their data so that its' Alexa voice-recognition virtual assistant and speaker can recommend songs and jokes they may like, or will they prefer tighter controls over their data to the possible detriment of technological advancement.

Data analysis

Collecting data on customers for internal analysis is a vital part of business today. Understanding what customers want, whether it be the colour of a shirt or a mutual fund that meets their risk profile, is important for customer satisfaction. However, once the data leaves the confines of the organisation that collected it, or is used for an alternative purpose without consent, perils ensue. Most customers won't object to the collection of data. In fact, there is an expectation that companies are collecting data on you to enhance the customer experience. It is the actual transmission and monetisation of that data that causes the problems.

THE FUTURE OF DATA LIES IN ANALYTICS

By Evangelos Tzimopoulos, Senior Manager

The ongoing proliferation of data – total worldwide data is predicted to grow ten-fold over the next seven years - brings a raft of opportunities and challenges. Embraced properly, it will provide immeasurable benefits for companies in multiple markets and the potential for transformation is vast. The key however is to embrace the change, and with the help of analytics, machine learning and Artificial Intelligence (AI), learn how to use it to your advantage.

This is however not a simple task. Fully embracing the opportunities requires not only the acknowledgement of the opportunities themselves, but also a series of complex governance and technology decisions built around a comprehensive data management and governance strategy. Without this framework, a business will struggle to embrace the changes.

Core disrupters of the digital age

Data technologies have emerged as one of the core disrupters of the digital age and analytics, defined as the discovery, interpretation and communication of meaningful patterns in data, is one of those. Analytics has become the new 'go to' competency within the business world, and data scientists are today's pioneers, leading the way. As well as creating opportunities, the developments also pose challenges in terms of disruption not only to the existing landscape, but also to organisations, their culture, structure and the skills required for them to succeed going forward.

To address these issues, let us take a look at the three main developments that have transformed how organisations look and use data:

- the exponential growth of data,
- the proliferation of high-powered analytics tools and machine learning to analyse the data by non-subject matter experts, and
- the use of the cloud as a distribution mechanism.

The explosion of data has created new possibilities which impact not only how data is stored and processed, but also the intrinsic value of the data and the insights that can be pulled from this data. Moreover, the use of new high-powered tools is changing how firms use analytics, moving away from summary or descriptive processes to planning, prediction, calculation and optimisation features made possible through machine learning.

Advanced analytics platforms

The advance of modern computing, the inexpensive hardware, and the availability of low-cost and distributed storage (the cloud) has allowed the development of data engineering tools and advanced analytics platforms that bring all these capabilities together to provide an all-inclusive ecosystem that can host, process and extract new value from (big) data.

As already mentioned however, transforming your organisation into one that is at the forefront of transformational data analytics is not easy. Data governance is a critical pillar in any big data or analytics programme as it helps prevent organisations opening themselves up to risk, such as data breaches, unsustainable data models and onboarding data that is never used. There are many things to consider when devising an appropriate governance framework, with the main three issues being data security and compliance, the team, and data quality.

Security and privacy issues

Collecting and storing vast amounts of data creates many security and privacy issues, making big data and data analytics a prime concern for IT security personnel at banks. The addition of cloud-based storage and distribution, with big data analytics layers, only serves to heighten these threats further. Another part of the challenge is that most data security systems are designed to work on small amounts of data and cannot be adapted for big data volumes.

Traditionally, access to data stores has focused on use-case management, but the lack of consistent categorisation often leads to misuse. Going forward, good transformational analytics governance will need to focus on data management rather than use-case management.

Enable and not restrict analytics

In addition, to fully realise the benefits of transformational analytics, data and analytics tools must be made available as widely as possible across the business. Not only data scientists, but business users and other technologists must be able to experiment with data to accelerate the discovery of critical business insights. The key is to enable and not restrict analytics. Show the users how to access the analytics tools, rather than tell them what they can't do. By enabling, rather than impeding, the data governance programme will be seen as a partner to get the right data to the right user, rather than a system to be worked around.

> "The key is to enable and not restrict analytics"

While the areas of analytics and data science have come a long way over the past few years, with more organisations using the domains to aid their strategic decision making, the potential is still vast. Significant amounts of time and money are being invested in the sector, with new technologies and methodologies emerging constantly. Ignoring these opportunities could be fatal for your business. Embrace the changes now and reap the benefits in all areas of your business.

GOOD DATA NEEDS GOOD GOVERNANCE

By Nathan Snyder, Partner

With the proliferation of data in recent years, it is no surprise that institutions are struggling to deal with what is currently one of the hottest commodities around. Whether you're a bank, a trading entity, or even a government body, on a day-to-day basis you will be faced with large quantities of data, sometimes sensitive, which needs to be collated, analysed and put to use. The key therefore is governance.

> "Effective data governance is reliant on data integrity, uniformity and correctness"

Good data governance is not only about meeting reporting requirements, it is also a way of showing that you are caring for information in a proper manner so the people who need it can access it, and have confidence in it. Moreover, a defined data governance regime shows that you have systems in place for collecting, storing, maintaining and gathering information correctly. It also enables you to respond to new and updated regulations as required in a structured manner and reduces the need for a one-off reactionary data management project every time a new regulation or compliance requirement comes up.

However, like any process or way of working, for a data governance policy to be effective it needs to be embedded into the culture of the business. Processes and systems for updating data need to be thoroughly explained and the importance of maintaining its accuracy emphasised continuously.

Effective data governance is reliant on data integrity, uniformity and correctness. To get there, organisations must start with a firm understanding of their data flow and lineage. Without this thorough understanding of where the data has come from, it is difficult for an organisation to vouch for the quality of its data and for the data to be useful in a regulatory context.

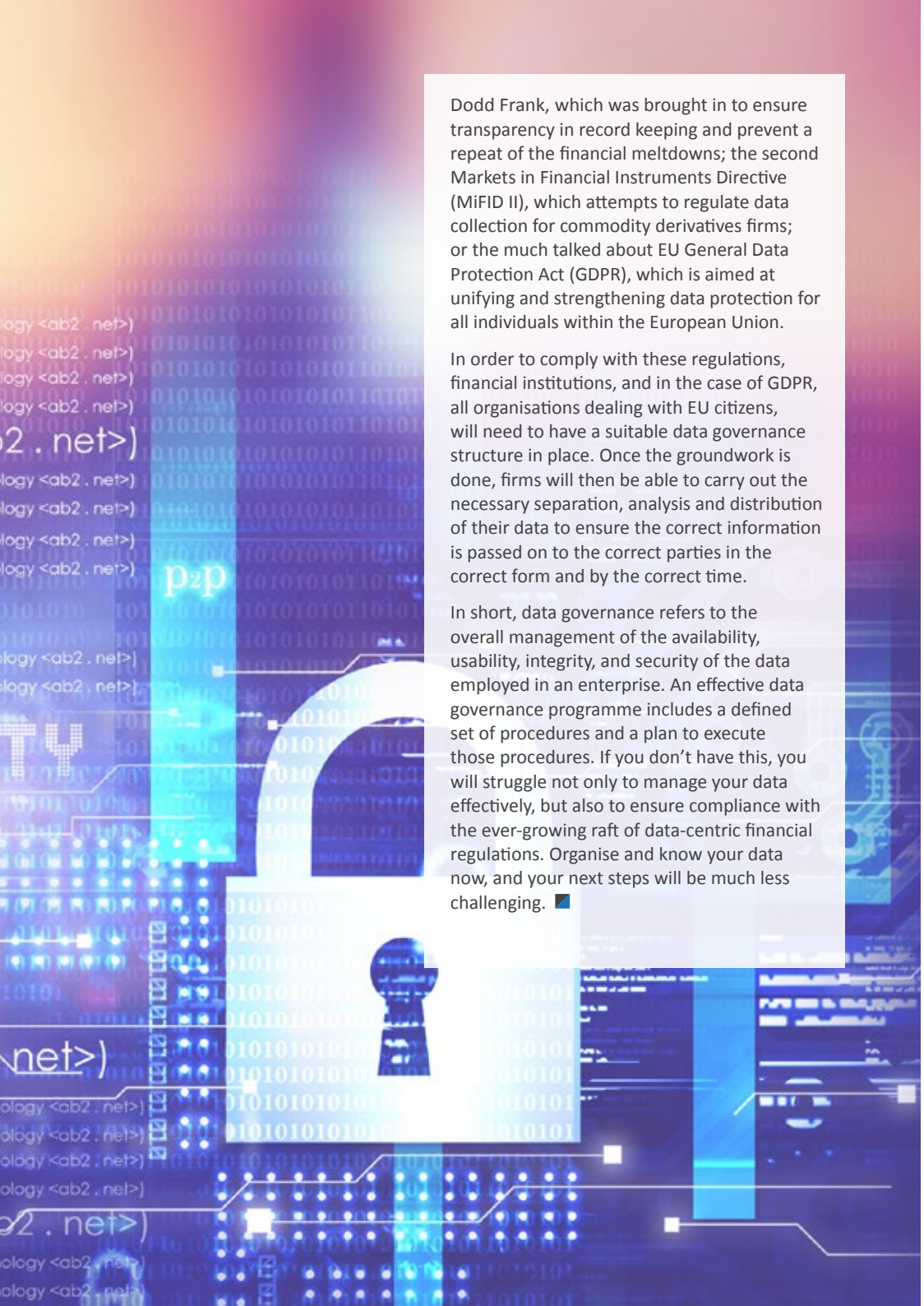
For example, in a legal case, understanding the origin of a piece of evidence, including who handled it, for what purpose, and how it was used, is critical in preserving its integrity and in turn influencing its effectiveness in a court room. The same is true for data. To claim data quality, an organisation must first understand how the data got to be where it is.

So how can firms help engage everyone into understanding the importance of ownership and accountability for data quality purposes?

The ultimate aim is good data governance therefore it makes sense to involve as much of the business as possible, thus encouraging immediate buy-in to new and unique insights. The key is to keep it simple. Make the data and the analysis easy to understand to avoid it becoming a black box that nobody understands or wants to go near.

The questions to ask are why and not what, with the aim of using data to not just uncover business value but instead create it. The amount of data available is so vast that most things can be done if the right methodology and processes are applied.

With regulations proliferating at almost the same rate as data, there is help at hand. After all, almost all financial regulations are inherently data centric, whether it's



Dodd Frank, which was brought in to ensure transparency in record keeping and prevent a repeat of the financial meltdowns; the second Markets in Financial Instruments Directive (MiFID II), which attempts to regulate data collection for commodity derivatives firms; or the much talked about EU General Data Protection Act (GDPR), which is aimed at unifying and strengthening data protection for all individuals within the European Union.

In order to comply with these regulations, financial institutions, and in the case of GDPR, all organisations dealing with EU citizens, will need to have a suitable data governance structure in place. Once the groundwork is done, firms will then be able to carry out the necessary separation, analysis and distribution of their data to ensure the correct information is passed on to the correct parties in the correct form and by the correct time.

In short, data governance refers to the overall management of the availability, usability, integrity, and security of the data employed in an enterprise. An effective data governance programme includes a defined set of procedures and a plan to execute those procedures. If you don't have this, you will struggle not only to manage your data effectively, but also to ensure compliance with the ever-growing raft of data-centric financial regulations. Organise and know your data now, and your next steps will be much less challenging.

QA ENGINEERING IN THE FAST-PACED WORLD OF DEVOPS

By Iya Datikashvili, Director

Want to build quality software in a rapid, continuous and repeatable manner? Then it's time to adopt DevOps.

The DevOps software development practice brings formerly siloed teams within an organisation together to work as part of an integrated team that does just that - builds quality software in a rapid, continuous, and repeatable manner. This new mode of delivery requires Quality Assurance (QA) engineers to shift their mode of work to keep up with the fast-paced, innovative, and automated world of DevOps. This is a big undertaking and starts with having a strong understanding of the role QA engineers will play within the DevOps team.

The reality is that testers in the DevOps world will play a much wider role in the software delivery process with far more varied tasks, compared to traditional waterfall or Agile environments. The QA function needs to become the enabler of DevOps, by embedding processes that reduce testing cycles and improve software quality throughout the software development lifecycle (SDLC).

Embedding QA practices throughout the SDLC

The DevOps practice removes the notion that QA is a separate function in the overall development lifecycle with its own set of roles and responsibilities. It necessitates that the integrated team syncs up and works together throughout the SDLC to achieve common goals.

With DevOps, QA is integrated within the cross-functional team and is involved with every aspect of software delivery, from requirements-gathering and system design, to

> "The reality is that testers in the DevOps world will play a much wider role in the software delivery process"

the packaging and releasing of the software. QA is no longer a discreet component of the SDLC chain solely focused on finding defects. Instead, its work is spread throughout the SDLC with quality practices embedded within each phase of software delivery. This is a major shift which makes the role of QA more critical than ever before.

One of the biggest changes with DevOps is that QA becomes involved in the entire release planning process and takes equal ownership to develop a single release plan that aligns the team's work streams. The dynamics of release planning changes from Dev complete and QA complete, to sprint complete, where the sprint is only considered complete once all of the tasks within the sprint are successfully tested.

Expanding test coverage beyond functional testing

DevOps changes the traditional idea that QA primarily performs functional testing and expands the QA test scope to include operational behaviours by examining each requirement for completeness. QA must start addressing the questions: 'are we building the right feature?' and 'are we building it correctly?' For example, in addition to the functional aspect of a requirement, QA will also examine how that requirement could affect system performance or be monitored in production. It will then design the appropriate

cases to test that behaviour. This means QA will play an integral part in ensuring system reliability, stability and maintainability, and will incorporate the necessary test coverage from the onset of the project.

In addition, QA will be involved in defining and executing the non-functional tests alongside Dev and Operations teams. This is a departure from traditional QA practices where non-functional testing would typically be out of QA's scope.

Automating the delivery pipeline and building a robust automation framework

With DevOps, QA will need to push the automation boundaries from just functional regression testing to automating everything

> "The DevOps value proposition lies in its ability to improve the overall service delivery of a product to the end user"

that will facilitate code passing more quickly through the pipeline. The QA team must look to automate as many processes as deemed feasible, including test case generation, test data set creations, test case execution, test environment verifications, and software releases. All pre-testing tasks, clean-ups, and post-testing tasks, should be automated and aligned with the Continuous Integration (CI) cycle.

Any changes related to software or system configuration should flow through a single pipeline that ends with QA testing. Automation should also apply to all non-functional tests such as performance, stress, and failover and recovery. Additionally, the automation framework should be flexible, easy to maintain, and allow for integration directly into the development workflow.

The DevOps value proposition lies in its ability to improve the overall service delivery of a product to the end user by integrating cross-functional teams (IT, Operations, QA, and Business Analysts) into a collaborative delivery team with common goals. As part of the DevOps team, QA will be involved in every aspect of the DevOps SDLC and practices, both from a business and technical aspect. In the DevOps world, QA engineers will undoubtedly need to adapt to new and challenging practices. However, once they have been through the transformation, they will have gained the necessary skillsets and disciplines to grow and excel their careers .

Brickendon has been nominated as finalists in the DevOps Industry Awards for the second year running.

DISRUPTING REGULATORY REPORTING

By Harpreet Singh, Executive Director

It may be more than a decade since the credit crunch that led to increased requirements to report trades and transactions across multiple jurisdictions, but financial institutions are still spending billions of dollars to ensure compliance. Despite this large outlay, some organisations continue to get it wrong, as proved by the hefty £34.5m fine levied on Bank of America's Merrill Lynch investment arm in October last year for incorrect reporting.

In short, regulatory compliance is not easy, and as the regulatory reporting industry has matured, so have the challenges facing financial institutions:

External regulatory challenges

- Multiple trade and transaction reporting obligations across global jurisdictions mean that the same or similar data is sent out to multiple regulators.
- The scope of reporting details in terms of asset classes, attributes and products is continuously expanding.
- Strict enforcement means that inaccurately reported results lead to higher financial penalties.

Internal challenges

- As products and counterparty-related scope expands, regulatory reports need higher-quality data from multiple domains.
- Disparate, and often fragmented, internal IT architecture and operational processes impede the building of a strategic reporting solution.
- Poor data quality due to a lack of master data solutions in each data domain.

- Regulatory reporting is considered a non-revenue generating stream of work that consumes a lot of resources.

Traditionally, many financial institutions built their own reporting solutions to comply with the regulations, a strategy that worked well when the trade reporting regulations were in a nascent stage and still evolving. However, as the regulations have matured, the question has arisen as to whether it makes sense for each institution to continue supporting their own custom build or if the money would be better spent on a commonly-owned solution.

While past attempts to design a common regulatory platform have not been universally accepted, the current regulatory landscape appears more suited to such a development. The reasons for this include:

- It is easier to outsource regulatory solutions due to more prescriptive or stipulated requirements.
- Vendors are more experienced due to the prominent role they have already played in the development of the regulatory reporting eco-system, ie. Trade Repositories (TRs), Approved Reporting Mechanisms (ARMs) etc.
- More recent regulations require interaction with industry services for reference or market data, such as ISIN or other such flags, making it more cost effective if dealt with by a vendor.
- A decrease in the number of new trade reporting regulations and switch in the regulators' focus to improving existing regulations and quality of data, reduce the probability of disruptive regulation that leads to changes in the business.

- A switch in focus from regulation to revenue-generating activities for the banks' core staff.

Notwithstanding the favourable industry environment, there are a number of issues that the financial industry needs to consider before taking on such a task:

1. features and functionalities of the solution,
2. choosing the right partner,
3. cost-benefit analysis,
4. ensuring the buy-in of key stakeholders,
5. internal sources for trade or transaction-related data, and
6. flexible cost structure based on usage.

Evolution of third-party vendor solutions

In recent years, both the number of reporting solutions, as well as the functionality provided by them, has grown. At a high level, they can be divided into three categories:

- Vendors originally focused on providing trade life cycle services (such as affirmation), but now provide a regulatory reporting solution.
- Vendors primarily focused on providing end-to-end regulatory-reporting solutions pertaining to certain jurisdictions or regulations.
- Vendors focused on providing part of the reporting solution. There are many new FinTech companies which are focusing on certain reporting functions, such as eligibility rules, best execution etc.

Each one of these vendors offers one or more ways to avail of their services, something that the technology staff within banks would need to carefully analyse before making a choice.

Reporting solution desirable features

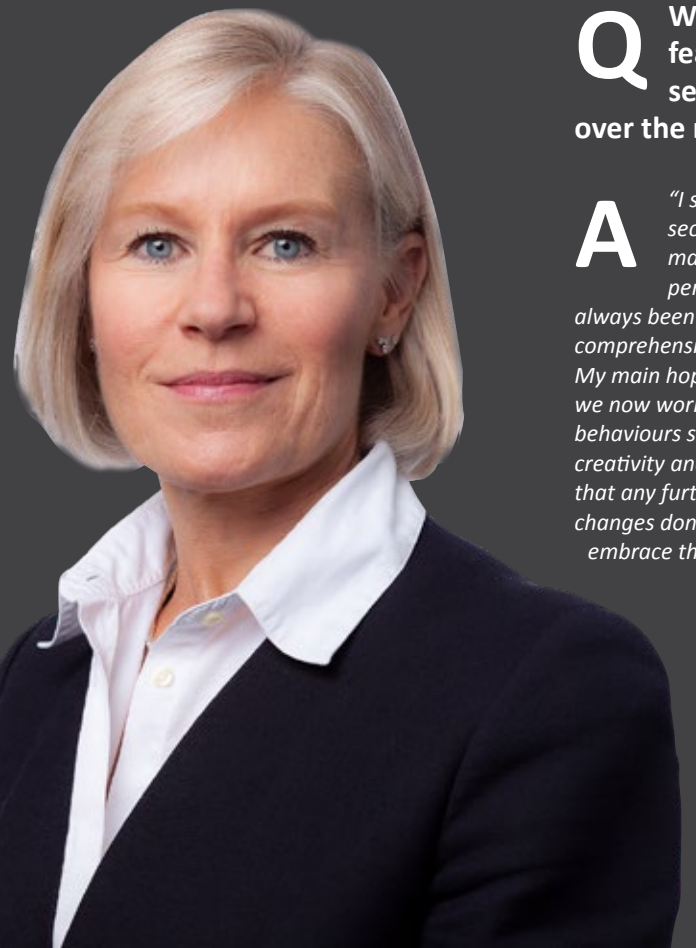
The responsibility for regulatory reporting is no longer a compliance or legal function. As a first line of defence, it is the business owners or day-to-day decision makers who are responsible for ensuring their business activities are correctly reported to regulators. Technologists face the challenge of continually improving latency reporting, as well as the overall stability of technology platforms. Control owners need solutions that can find gaps in the operational functions and remediate them in a timely fashion.

Selecting the right vendor

After finalising features and providing weightages according to the agreed set of requirements, financial institutions will need to determine their vendor-selection criteria and rate vendors on their various features, such as reporting engine capabilities, integration methods and architecture. It is key to note however, that while these aspects are important, it is also good to consider the non-quantifiable elements, such as the cultural aspects and future trends.

While there is no quick fix to the challenges around regulatory reporting and compliance, the time is ripe for the industry to come together and find more novel ways of reducing the cost of compliance. Building a quorum around a universal regulatory reporting platform that reduces duplicity and redundant data across multiple jurisdictions is just a first step towards that goal.

BRICKENDON NON-EXECUTIVE DIRECTOR CLARE CHALMERS SHARES HER THOUGHTS ON THE FUTURE OF THE FINANCIAL SERVICES INDUSTRY, THE IMPORTANCE OF STRONG LEADERSHIP AND THE ROLE OF WOMEN IN THE BUSINESS WORLD.



Q What are your hopes and fears for the financial services sector now and over the next five years?

A *"I started in the financial services sector over 25 years ago and the magnitude of change over that period is unprecedented. There have always been regulations, but none as comprehensive and explicit as they are now. My main hope is that the regulatory system we now work within deters some of the bad behaviours seen in the past but does not stifle creativity and entrepreneurialism. I also hope that any further governance and regulatory changes don't deter the sector's ability to embrace the digital age."*

Q Your expertise lies in the area of leadership, how important do you believe it is for a company to have a strong leadership team? What are the most important traits for a good leader to show?

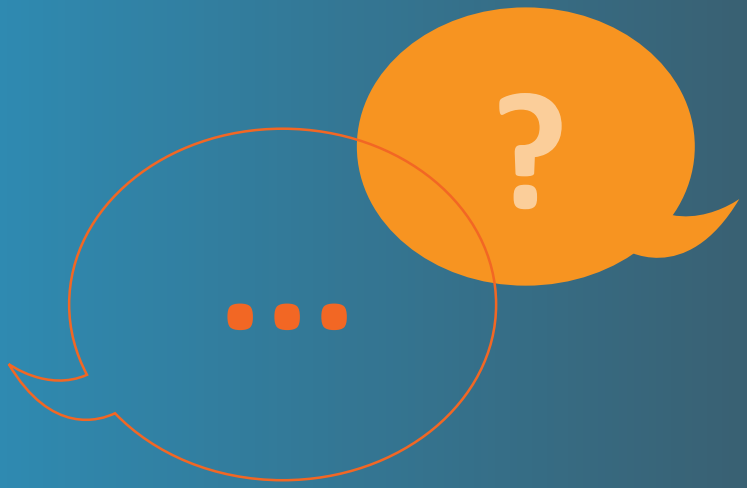
A *"Dynamic and empathetic leadership is paramount in my opinion. The leadership team's understanding of culture, level of integrity, set of values and behaviours, all contribute to determining the ethos of the organisation. Having the right leadership helps to establish the right behaviours. A strong CEO with an equally strong senior leadership team will demonstrate priorities and lead by example to build and sustain the business. Communication skills, being involved and not directing from afar are key attributes pertaining to good leadership, while maintaining an understanding ear to the ground is key to recognising what is really going on in the business. My list of key qualities for good leaders would include the ability to develop others by motivation and inspiration, as well as having a clear vision for the direction of the organisation. Words that spring to my mind are empathy, inspiration, commitment, communication, decision-making and delegation."*

Q **It is no secret that women are under-represented in the financial services sector. What does this mean for the success of the sector and how can we help to change this?**

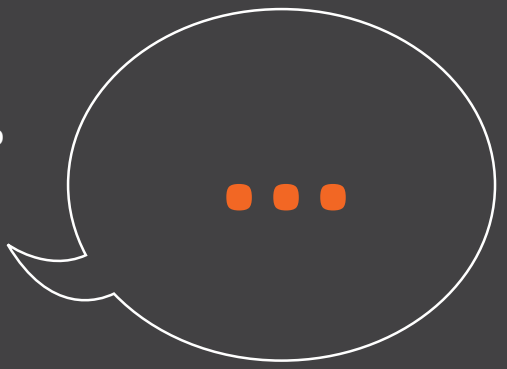
A *"Progress is being made, however it is a lot slower than most of us would aspire to achieve over a given period. We need to bring the excitement of the sector into the education system a lot earlier, whilst at the same time seek to retain more senior women who have risen through organisations. By including women in both the graduate and lateral hiring processes, organisations demonstrate diversity is at the top of their agenda."*

Q **As a high-flying woman yourself, what do you feel are the benefits of a diverse workforce?**

A *"Only recently in The FT, I was reading about a harassment case that took place in 2010. One of the recommendations in the report as to how to avoid situations like this arising, was to hire more women as they bring a different perspective, values and culture to an organisation. However, the benefits are wider ranging than purely gender, and having a diverse mindset when hiring naturally gives a wider pool from which to select top talent thereby increasing cognitive diversity. Having a diverse workforce brings different thought processes, different perspectives and a wealth of differing experiences."*



Q **The global landscape is changing, and digitisation is becoming part of everyday life in finance, business and social affairs. Brickendon too is expanding its footprint in this area with the introduction of more products through Brickendon Digital. How do you see the emergence of the digital landscape playing out in the business world?**



A *"I am very excited about Brickendon's latest products, particularly as financial institutions are investing in digitisation as a means to enhance their product offerings. Challenger banks are posing an additional strain on the more traditional market incumbents and therefore the latter will have to invest more in digital technology to maintain their existing client base and compete with the disruptors. I think financial services organisations in particular, are re-thinking their strategy in today's increasingly regulated world, and will therefore be more open to finding businesses that can work with them to make the most of the new technology. I think that digitisation also requires an element of human understanding, which will sit nicely with Brickendon's product division and consulting practice."*

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Brickendon is an award-winning global transformational management and technology consultancy specialising in innovative solutions that save our clients time and money. Our aim is to deliver transformational change across our three key offerings of Advise, Change and Do, through our five practice areas: Data, Quality & Test, Risk & Regulation, Strategy and Digital. This helps ensure our clients see positive results in weeks, not months or years.

Employing domain experts with over 10 years' respective experience in specialist sectors, Brickendon is built on providing lasting, cutting-edge solutions designed to improve profitability, efficiency, competitiveness and innovation across the financial services sector. We are passionate about what we do and thrive on transforming companies to increase their competitive edge.

Started in London in 2010, the driving force behind Brickendon's global strategy is transforming the traditional consultancy model. We now have multiple offices across Europe and the US, including in London and New York.

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