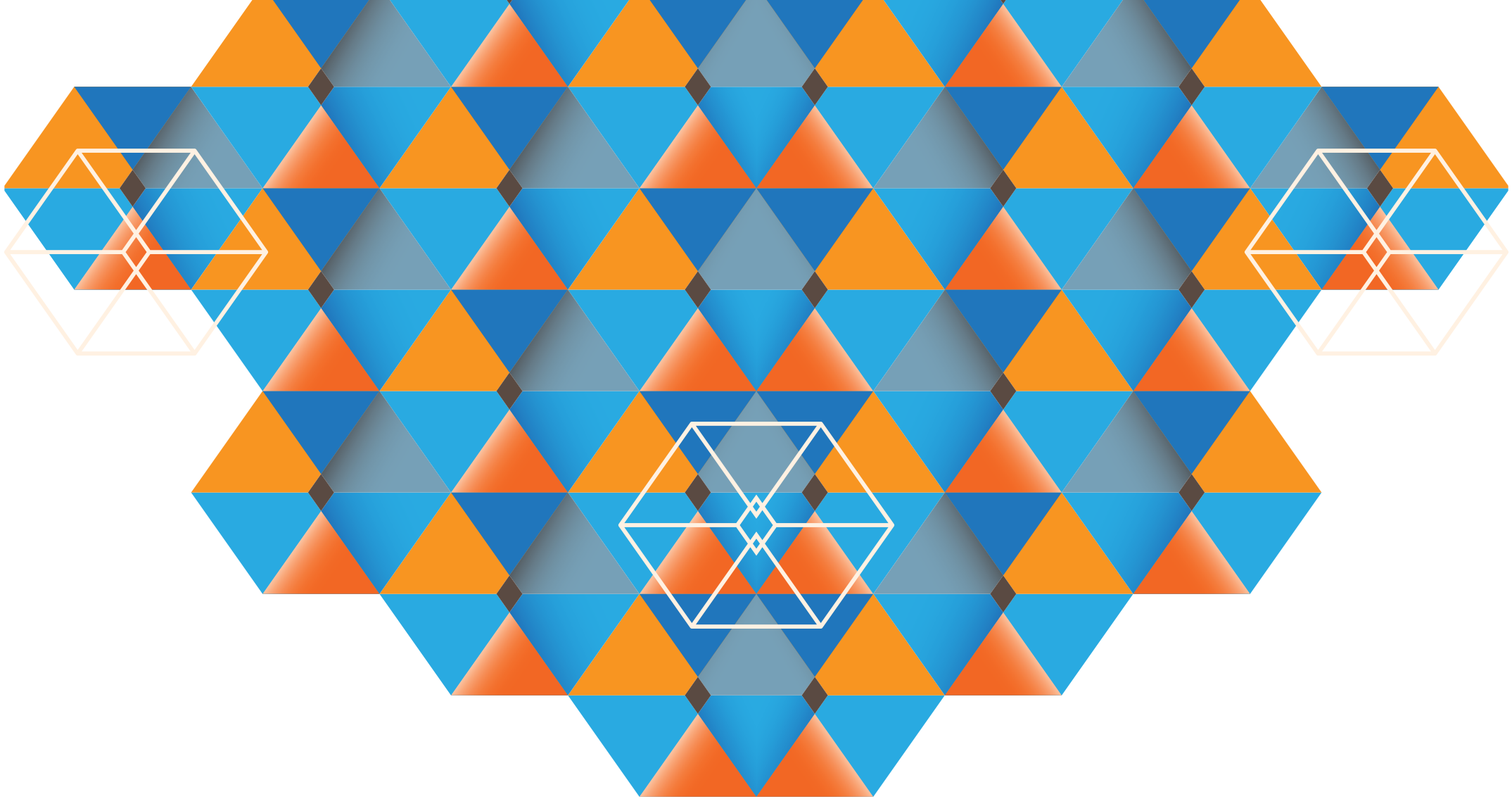

Brickendon Journal 01

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More BIG plans for 2014.....

"Our aim is to double in size through 2014"

With 2014 already well upon us, Brickendon Consulting director James Baker reflects on the successes of 2013 and shares the company's plans for the future:

"2013 was a great year! Brickendon expanded further, bringing our total headcount to 66 in just under four years. We now have experts working on site at high-profile investment banks and energy trading firms across the City, providing both management and technology consulting services.

Our aim is to double in size through 2014 to more than 120 staff, and are on target to reach our goal of 200 by the end of 2015.

We began January 2013 with significant investment in rebranding, launching a new website and developing a Knowledge Leadership function to transfer skills and experience amongst our consultants and share the benefits with our clients. The aim is to maximise our quality of delivery to clients through unique Brickendon approaches and solutions.

2013 also saw us add two new directors. Nathan Snyder joined from Credit Suisse and leads our regulatory reporting solutions. He is a senior director within one of our larger tier one investment banking clients. Christian Marshall joined us from LCH.Clearnet where he headed technology for the LCH FX OTC Clearing service, ForexClear. Their respective experience, ideas, energy and commitment are fantastic and we are delighted they are on board, joining Chris Burke and I, for another successful year in 2014.

During 2013, Brickendon also:

- Successfully completed six projects on time for our clients.
- Began 10 new projects which are still in flight in Q1 2014 and running to schedule.
- Won the Best Automation Project 2013 at the European Software Test Awards (TESTA). Brickendon were also named as finalists in the Best Use of Test Tools and Test Innovator of the Year categories, ahead of several much larger organisations.
- Successfully delivered a front-to-back Openlink v10 Energy Trading Risk Management (ETRM) programme for a top 5 wholesale energy trading firm.
- Created a bespoke testing programme for the eFX operations of a major European bank, incorporating Brickendon's specialist approaches: Time Check Point System (TCPS), Integrated Test Tools Approach (ITTA) and Test Metrics Solution (TMS). (These solutions are already in demand from new clients).
- Remained exceptionally cost competitive on margin by maintaining only a minimal bench, with nearly 100% utilisation of consultants throughout the year with no significant staff attrition.

Investment for 2014 will increase within our Knowledge Leadership function, with additional funding for new training programmes to further improve our service offerings. There is planned expansion for our eFX, Regulatory Reform and Energy Trading practices, and increased budgets for Management and Business Strategy Consulting.

Looking ahead, we aim to engage with you, our valued clients, on a more regular basis through frequent market updates, whitepapers, key note speakers and shared training opportunities.

I would like to thank all of our clients for your repeat business and ongoing support. We strive to continue improving and bettering our services in every way possible to ensure you get great value for money and keep coming back to us."

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Offshore. Onshore. Not Sure?

"Offshoring is no longer such an attractive option"

A few years ago the buzzword was offshoring. Now it seems, for some, it's all about the reverse.

Banks such as RBS and manufacturers including electronics giant Sony and toy train maker Hornby are seeking to relocate resources back to the UK amid concerns about security, rising costs and varying quality of work.

Over the past decade, many firms have relocated large parts of their operations overseas in a bid to save money. Enticed by low overheads and vast pools of available talent, companies moved technology hubs, data and call centres, and production lines out of the UK. Now however, many firms are feeling the effects, with low quality work and security concerns impacting on their brand and loss of IP impacting their competitiveness.

"Offshoring is no longer such an attractive option," said Christian Marshall, a director at Brickendon Consulting. "Resources overseas tend to be lower quality and therefore need more testing and assessment.

"In many cases you have to run a project in a different way to meet the capabilities of the people working on it, rather than following your actual business model."

As a result, according to Marshall, firms often end up running a fragmented, compartmentalised project, with no one team having a full overview. "You lack the architectural level appreciation of how it all fits together and this can be quite costly for a project," he said.

In addition to organisational issues, there are also concerns about reputation. RBS has recently been criticised in the national press for stability failings, after an estimated 750,000 RBS, NatWest and Ulster Bank customers were unable to use their credit and debit cards for several hours on one of last year's busiest shopping days. The company employs several thousand people at technology service hubs in India following an earlier aggressive offshoring campaign.

RBS isn't alone however, with many financial institutions and consultancies, including Standard Chartered and HSBC, choosing to source programming skills or IT management capabilities offshore at a fraction of the cost charged in the UK.

According to a recent survey from the government's Manufacturing Advisory Service, more than a quarter of companies in London and the south-east said concerns about quality, cost and delivery issues associated with offshoring were forcing them to bring production back home.

Steven Barr, head of the Manufacturing Advisory Service, said: "There is certainly a growing desire from our companies to take production home, with 15 per cent of firms reporting that they have, or are, in the process of bringing production back.

"This marks a major change in approach from five years ago when the Far East and Eastern Europe seemed to be the destinations of choice."

Moreover, some financial institutions have been forced to duplicate offshore resources in London for some parts of their operations, such as private banking support or critical projects and initiatives, following complaints from high-profile clients.

"There's a much bigger focus on the customer experience," said Marshall. "And levels of service and reputation are both fundamental to retaining existing clients and winning new business."

"There's a much bigger focus on the customer experience"

As an organisation, Brickendon is well placed to assist firms undertaking reshoring initiatives, with a constructive business case based on the true total cost of ownership of the offshore arrangement. According to Marshall, the case for offshoring is often constructed with too great a focus on the individual cost per head.

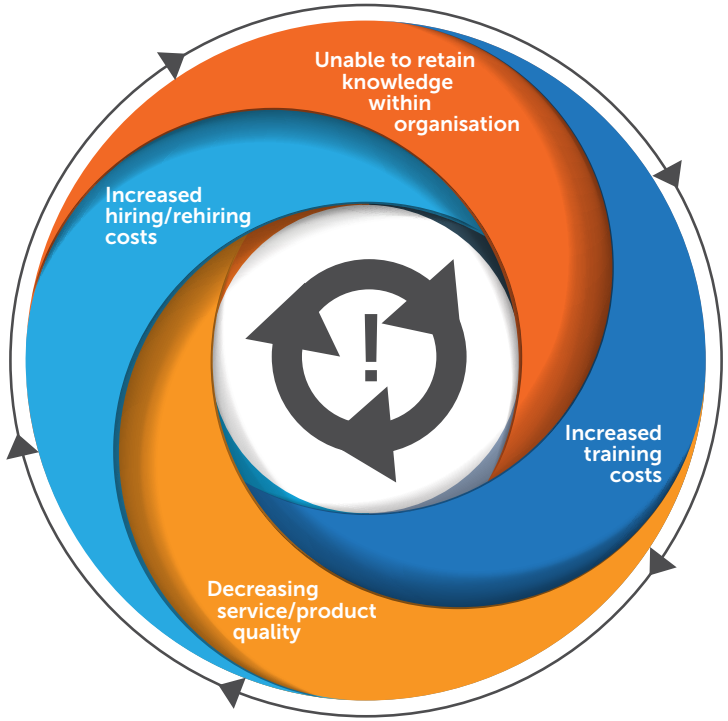
"Whilst perhaps being the easiest to measure, the individual cost per head does not show the complete picture. Offshoring organisations often incur a far greater level of attrition than is anticipated or budgeted for," said Marshall.

"Ideally, this problem should be mitigated by assigning additional staff to the project to absorb losses, however in practice, these 'buffer' staff often find themselves without tangible roles or responsibilities.

"After a surprisingly short period of time they become dissatisfied themselves and can actually accelerate the rate of attrition."

The impact of this constant cycle of attrition, replacement and retraining of offshore staff is that the organisation rarely reaches the state where it has developers or analysts able to perform their duties to the expected degree of competence.

One of the most critical secondary impacts of this is that organisations are not only losing their newly-trained offshore headcount, but they are also losing their IP – as the skills, knowledge, business practices and experience flow out of their door and often immediately through that of their competitors. This problem is extremely hard to mitigate, as it is impossible for offshore staff to operate properly without any institutional knowledge of the organisation, and impossible to realise any cost savings without reducing or removing that knowledge back in the main office.



Cycle of Attrition

An often unexpected impact of offshoring is the amount of time and focus management and senior technical staff have to dedicate to 'making offshore work.' This includes managing the account; packaging work in such a way that it can be efficiently processed; training and re-training replacement staff; as well as managing down expectations of service from users.

The important thing, according to Marshall, is to quantify the true cost of offshoring. For offshored customer services, this can be best done by interviewing staff and users and analysing call-log data to assess any deterioration in service level. For offshored software development, cost and time-to-market can be compared between offshored teams and skilled, onshore teams collocated with end users. In all cases, it is important to assess the extent to which the change lifecycle has been adapted to support offshoring at the expense of the business.

"The important thing is to quantify the true cost of offshoring."

A reshoring initiative can also be successfully coupled with an organisation's Corporate and Social Responsibility (CSR) programme. Local headcount can be sourced via graduate and apprenticeship programmes, generating both positive publicity outside the organisation, and considerable goodwill within.

Dominance Creates Opportunities

It's all about client stickiness...

Many commentators and observers of the FX banking market will frequently talk about the so-called 'flow monsters' dominating the market for currency circulation. These large players include banks such as Barclays, Citi, Deutsche Bank, JP Morgan and RBS, which according to a recent EuroMoney study, have a combined market share of approximately 57 per cent. Furthermore, the top 10 FX banks account for close to 80 per cent of the global FX market, which turns over close to $5.5 trillion per day (Triennial Central Bank Survey 2013).

While this dominance sounds impressive, it comes at a great cost to the banks, and is increasingly becoming a cost that is difficult to carry.

Participating on the scale of the top five banks is incredibly capital intensive, time consuming and highly expensive to maintain. Strategies and technology platform services must be updated regularly, and a level of progressive evolution is essential in order for each player to differentiate itself from its nearest rival.

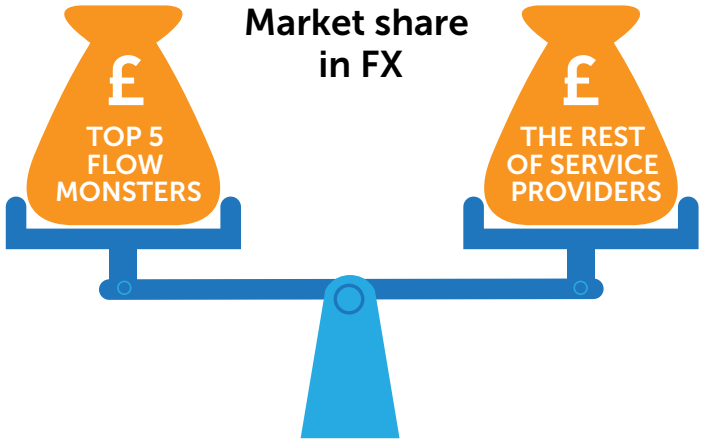
For some of the top banks, this sector domination has raised questions about the commercial viability of other operations and prompted questions about their place within the business. For example, some banks have recently acknowledged that participating in the OTC commodities market is not an entirely natural fit. For these institutions it has been difficult to secure a big enough share of the market or to gain sufficient client traction to win the right kind of business that allows for both vertical and horizontal selling. This is in part due to the cultural make-up of the banks, as well as the lack of visibility and integration across the sector.

So where are the opportunities for the smaller flow monsters? Last year, we saw some institutions starting to increase investment in commercial transaction banking infrastructure and service and sales teams, a move which should allow 2014 and 2015 to be years of increasing profits and a better client service.

As a result, the game is far from over for the smaller FX banks. The increased focus on the customer and the provision of a quality service is in fact an opportunity for the smaller players to carve a niche in the FX arena.

Transaction Banking and processing large FX flows is a core lynch pin and underbelly for some banks, and ramping this up is increasingly becoming a primary talking point for the commercial banking operators.

"It's all about client stickiness," said Brickendon Managing Director Chris Burke. "Maintaining ownership of the core corporate client, servicing them well and ensuring a wide choice of competitive offerings."



Market share in FX market

How is this being done? Talent that was developed in the big flow monsters, and the resources that worked on pioneering, designing, delivering and supporting these behemoth FX trading systems have been seeping away and are gradually being absorbed by firms that make it their business to assist banking players in the delivery of sophisticated front-end technology that works for both the bank and the client. Some banks have been quick to hire this talent directly and are embarking on modifying their own proprietary technology.

The importance of the Single Dealer Platform (SDP) in the mainstream FX trading environment is still incredibly fundamental to the core strategy, despite regulatory changes. However, the role of the transaction banking platform for clients to efficiently carry out their international cross-currency transactions and link this in with their treasury set-up is fast becoming another way to secure a share of the FX market, retain important FX revenues, and in turn, maintain relations with that all-important customer.

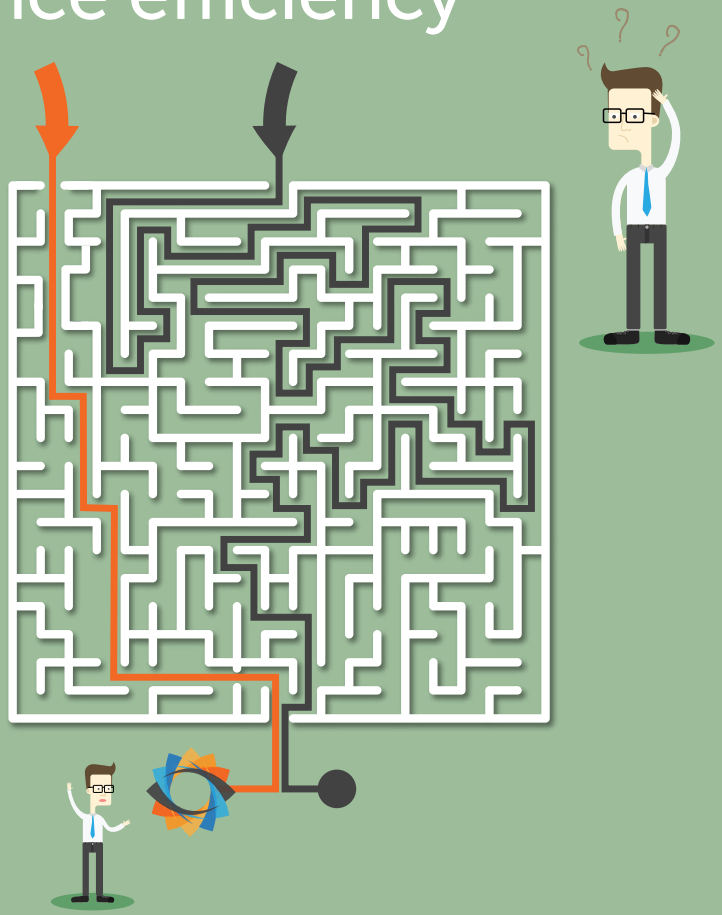
Most large banking clients or small to medium-sized enterprises around the world demand the same level of service when carrying out their transaction requirements as they are accustomed to when trading FX.

Customers are what it's all about

The next few years will without doubt continue to be a time of change as banks adopt new regulatory requirements and continue to assess where their core services lie; question what is generating real revenue; where they can grow their service; and ultimately, how they can better serve their customers.

After all, the customers are what it's all about. Without them, there is little scope to grow and advance the business.

Strive for simplicity, enhance efficiency



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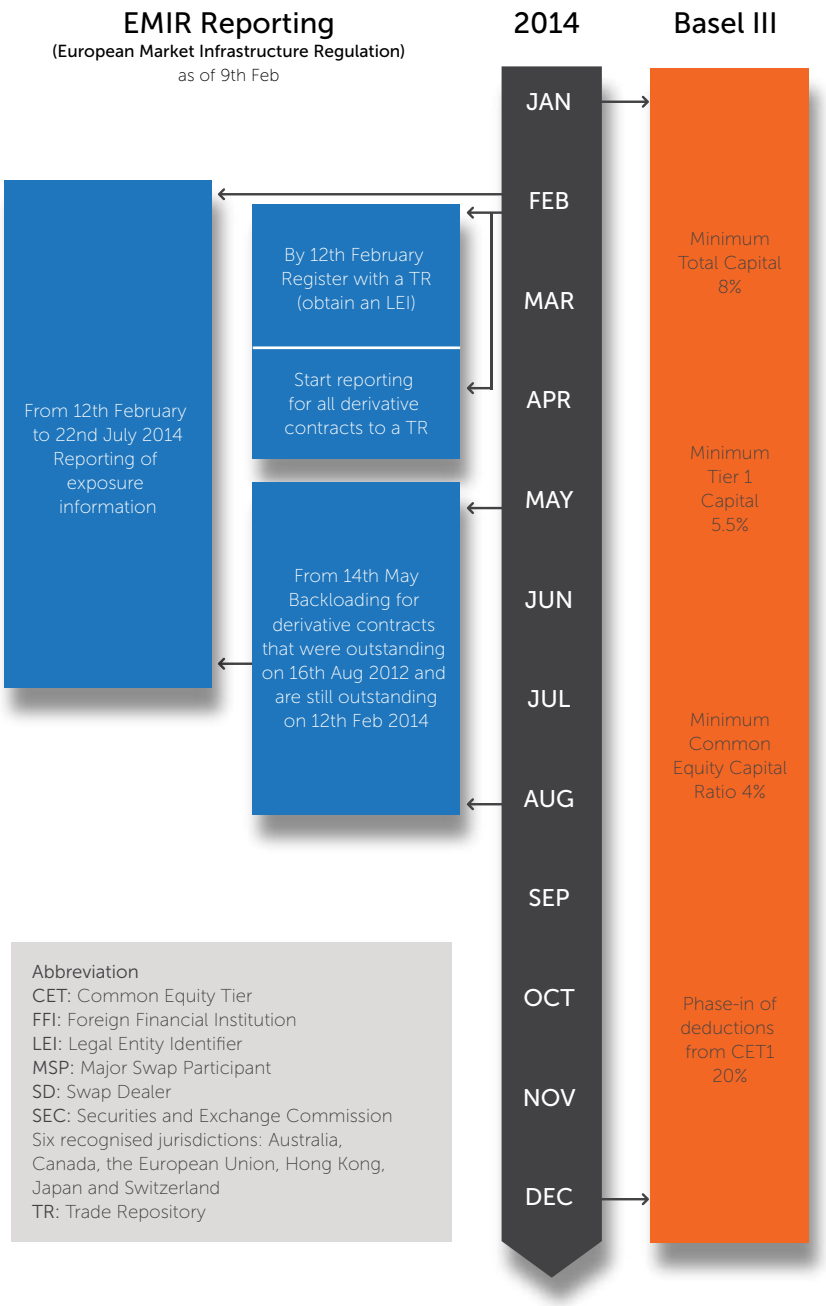
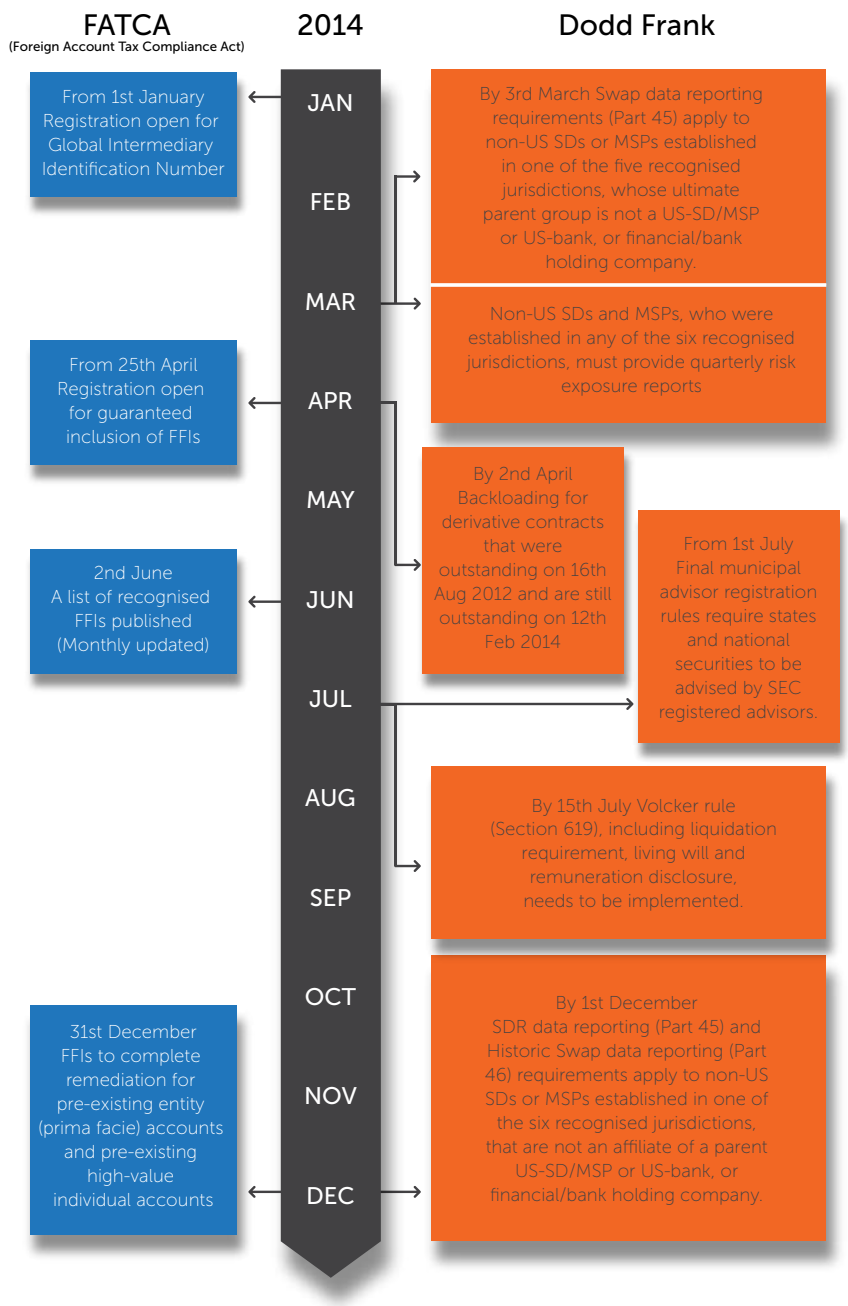
Businesses are faced with critical decisions every day, with slow or wrong decisions costing time or money. Through a better understanding of your business, Brickendon believes you can drive a direct path through the challenges posed by regulatory changes, rising costs and inefficient systems to build a better future for your business.

To find out more visit www.brickendon.com or scan this code to contact us now

Read our case studies at www.brickendon.com



Regulatory Timeline in 2014



Delegated Reporting

One year later and dual-sided reporting is a reality for EMIR market participants

When European Market Infrastructure Regulation (EMIR) reporting requirements were announced in February 2013 there was much discussion about the requirement for both parties to report each trade – a significant variation from Dodd-Frank. One year later, and dual-sided reporting is a reality for EMIR market participants.

Reporting trades to an authorised Trade Repository (TR) can be a complicated business requiring dedicated infrastructure, and many market participants are not keen, or not able, to meet the requirements themselves.

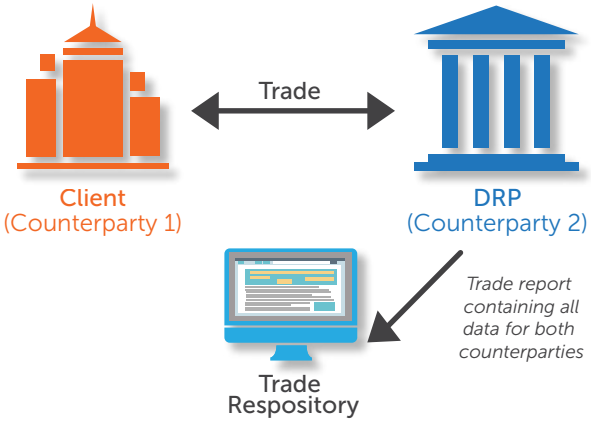
As a result, EMIR has introduced 'Delegated Reporting,' whereby a trade counterparty can empower a third party to report on their behalf.

There are three main types of Delegated Reporting being offered today:

Full delegation

The client delegates all reporting responsibilities to the Delegated Reporting Provider (DRP).

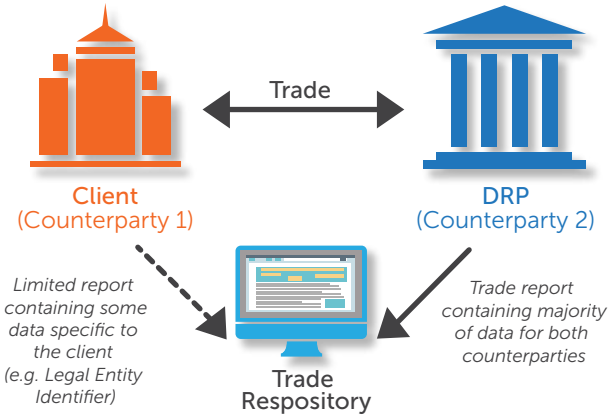
- DRPs offering this model are usually banks or other large financial institutions interested in providing value-added services to their clients. The DRP gets the benefits of client retention as well as the potential for additional revenues.
- Clients benefit from a simple solution which requires minimal setup and maintenance. However, clients trading with multiple DRPs will need to enter into multiple agreements which are likely to have differing operational requirements.



Partial delegation

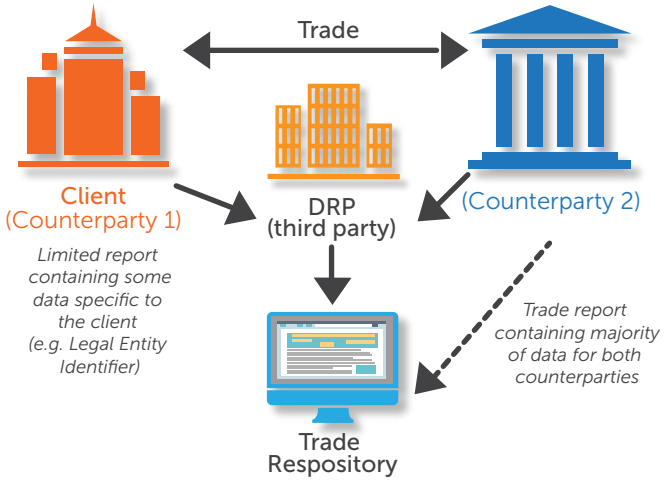
In this model, the DRP provides a limited service that reduces, but does not eliminate, the client's need to report.

- TRs offer this model of Delegated Reporting as it is a potential source of revenue, with every counterparty required to have a relationship (even a limited one) with the TR.
- DRPs find this type of service easier to build.
- Clients will see significantly reduced benefits as they are required to enter into agreements with both the DRP and the TR.



Third party delegation

One or both counterparties delegate their reporting to an organisation that is not counterparty to the trade.



The full impact of EMIR is still to be felt and the maturing of the delegated reporting market in 2014 will play a significant part

- DRPs in this instance are likely to be exchanges or post-trade processing platforms that are looking to consolidate existing relationships and obtain new clients.
- Clients requiring Delegated Reporting services have an opportunity to meet all their regulatory requirements via a single arrangement if they are able to find a third party DRP that interfaces with all relevant counterparties across all applicable asset classes.

With three main types of Delegated Reporting and a wide variety of individual nuances created by each DRP, clients have some significant choices to make.

Nathan Snyder, a director at Brickendon Consulting commented: "EMIR has effectively created a new market place where banks, exchanges, trade repositories and others will compete to offer the best Delegated Reporting service.

"Many investment banks are receiving demands from their clients to offer a simple and robust solution. Clients will move their business, rather than manage the overhead of reporting for themselves."

The full impact of EMIR is still to be felt, and the maturing of the Delegated Reporting market in 2014 will play a significant part.

A Brief History of FX Connectivity

In the beginning, was Breton Woods

From its roots at the 1944 Breton Woods agreement, the OTC FX market began requiring simple connections and trade flows between the primary market participants: investment banks and established intermediaries such as interdealer brokers (IDBs). As technology developed, these intermediaries included the suite of third-party systems and platforms which became known as Electronic Communication Networks (ECNs).

Many CCPs raced to build a clearing service to capture new business

This continued for over 50 years through to the early years of the millennium when prime brokerage exploded onto the OTC FX scene. Prime Brokerage allowed clients, typically hedge funds or commodity trading advisors, to trade with a financial institution (the executing broker) via a third financial institution (the prime broker), who underwrote the client's transaction. This arrangement benefited all parties: the client leveraged the superior credit rating of the prime broker; the prime broker had guaranteed business from the client; and the executing broker was not exposed to the credit risk of the client.

Into this environment emerged middleware providers, in some cases growing out of the interdealer brokers who were already positioned between the banks, providing not just connectivity, but also order management, limits and take-up processing (the process by which the prime broker legally accepts the trade on behalf of the client).

Introduction of mandatory clearing - Dodd-Frank and EMIR

In 2010, the US passed the Dodd–Frank Wall Street Reform and Consumer Protection Act in response to, and to prevent a recurrence of, the 2007/8 credit crunch and ensuing financial crisis. In the EU, the European Commission adopted European Market Infrastructure Regulation (EMIR) in July 2012 and it became effective in August of that year in all EU member states.

One of the many provisions implemented through these acts, was the directive for OTC trades to be cleared centrally. This was newly described as a Derivatives Clearing Organisation (DCO) in Dodd-Frank, and EMIR introduced a similar concept of clearing via an authorised Central Counterparty (CCP).

While interest rate swaps (IRS) and credit default swaps (CDS) were mandated for clearing relatively swiftly, FX has still yet to be enforced by either the CFTC in the US or ESMA/FCA in the UK.

In anticipation of an expected mandate for OTC FX clearing, many CCPs raced to build a clearing service to capture this new business – a race which was eventually won by LCH.Clearnet, who launched their ForexClear service in March 2012.

The introduction of a CCP to the OTC FX market brought a radical change to the connectivity required for participating members. Previously, two financial organisations could enter into – and remain in – a bilateral OTC trade agreement. Therefore, the minimal connectivity required was between the two counterparties (perhaps facilitated by an interdealer broker). By contrast, a CCP works by stepping in between these counterparties and novating the trade – breaking it into two new trades, both of which are against the CCP.

Thus with the introduction of clearing, financial institutions now needed connectivity to the Clearing House as well as to each other. This led to a new issue: with the multitude of trades conducted daily between large organisations, how could the clearing house be certain to have matched the correct originating trades to each other before novating them?

Taking LCH.Clearnet's ForexClear as our example, this matching task was outsourced to one of the third party middleware providers. The strategy being to remain true to the horizontal silo model of the clearing house and allow the financial institutions using the service to select their matching provider independently of their clearer.

Consequently, users of the service, the CCP's direct clearing members, now required connectivity to a Matcher as their route to the Clearing House.

Client Clearing and FCMs

Asset managers had little enthusiasm to be full members of the clearing house

Mandated clearing for interest rate swaps and credit default swaps began with a requirement solely for inter-bank trades to be cleared and then propagated through the asset managers on the buy-side. Asset managers had little enthusiasm to be full members of the clearing house due to the obligation to participate in the default management process.

Therefore, they accessed clearing via one of the existing clearing members who functions as a Clearing Broker (CB or an FCM – Futures Commission Merchant – in the US client clearing model), performing a similar role to a Prime Broker by underwriting the asset manager's liabilities at the clearing house.

Clients therefore require access to the executing broker with whom they trade and the FCM who provides clearing for them. The FCM requires access to the clearing house and the executing broker to both the clearing house (assuming they are a clearing member themselves) and the client.

SEFs

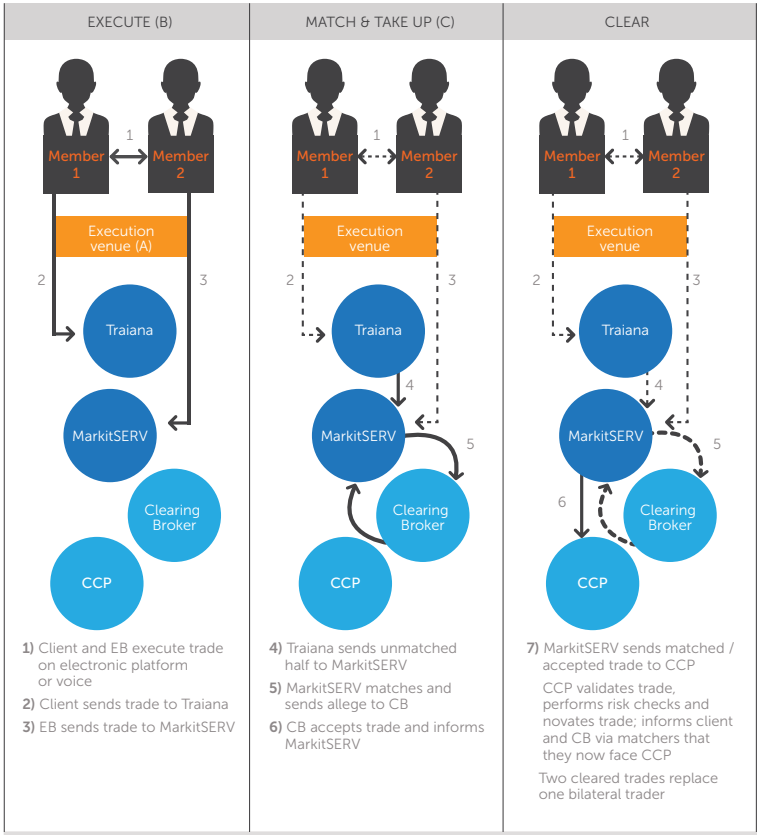
Another provision from the Dodd-Frank Act, designed to increase transparency of OTC transactions, was the directive for OTC trades to be executed over Swap Execution Facilities (SEFs).

SEFs are forming out of the existing market intermediaries – the ECNs and the IDBs – and are now subject to new reporting requirements by the regulators.

Interestingly, regulations determine that a trade executed over a SEF is legally confirmed – previously a key function of the Matchers in the pre-SEF clearing landscape – and as a trade executed on a SEF does not need to be matched, this posed a threat to the business model for matchers in FX OTC clearing.

Perhaps in anticipation of this, the matchers signed up the IDBs offering both connectivity to the CCPs and assistance with regulatory reporting. The ECNs by contrast are likely to be considering connecting directly to the CCP themselves, circumventing the matchers entirely.

Client vs clearing member



Clearing at CCP - Simplified tradeflow

Credit Hubs

One click through a GUI and a deal is done

The advent of SEFs will make FX OTC trading look and feel more and more like exchange trading for clients – one click through a GUI and a deal is done. However, if a trade is mandated for clearing, then it must be accepted by a Clearing Broker before it is done. In a real-time, high-volume trading environment this raises a problem for the clearing brokers: managing credit limits for all of their clients who could be trading via several SEFs simultaneously.

The matchers have proposed the answer – the Credit Hub. A credit hub works by allowing the clearing broker to post a credit limit for each of their clients onto the hub and allowing SEFs to access this in real time.

Thus, if the SEF receives a positive response back from the credit hub this should guarantee acceptance by the clearing broker. Shouldn't it? Well the one participant that the credit hubs do not include is the CCP. The CCPs will be performing their own risk management on the trade and portfolio and comparing the margin requirement to the collateral physically lodged at the clearing house by the clearing broker and specifically made available to that client. Regardless of how large a credit line is posted to the credit hub, sufficient funds will still need to be lodged at the clearing house for a trade to be cleared successfully.

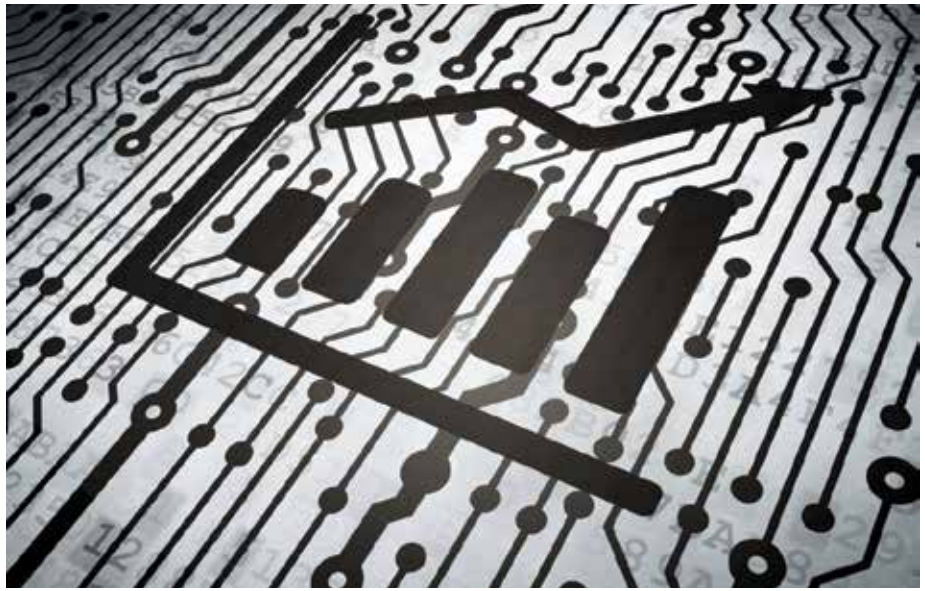
2014 and beyond

The CCPs have a number of innovations themselves in the pipeline, which have the potential to change the FX connectivity architecture – or at least to offer alternatives to the market participants.

The ECNs, in preparation for the SEF mandate, are working towards connecting directly to the CCP, taking advantage of implicit confirmation following execution on their platform to circumvent the matchers.

Furthermore, the CCPs are building out direct connectivity to the clearing brokers for the acceptance flows – a key requirement for direct SEF connectivity as the SEFs are unlikely to provide this connection.

CCPs have always offered margin simulators, sometimes as a standalone application, sometimes as a web tool. In 2014, these are expected to evolve to become fully automated live services offered alongside the clearing service. This would allow members to send ad-hoc messages to the clearer to determine the margin on a prospective trade. Following this margin simulation, services are expected to evolve further to include the current total liability at the clearing house and collateral lodged to allow members to always keep a live reading of their available collateral at the CCP.



If such a utility were to be provided to the SEFs, then this would provide much of the functionality of the clearing hubs.

Once this is completed, it is reasonable to expect that this available collateral reading and margin estimate would be included on the clearing broker acceptance message – informing the clearing broker whether a trade would be likely to clear or not.

It is a small step from here to offer genuine certainty of clearing, reserving collateral for a hypothetical trade sent through the margin simulator so that once the real trade comes through it is guaranteed to clear.

Certainty of clearing is also being addressed by clearing hubs who are developing a model whereby the FCMs issue a token to clients representing the risk levels which the FCM is willing to accept for the client. This token could then be used by the SEF to allow execution, preventing trades from being sent to the clearing house without it. Once the trade is sent to the clearing house with the token, explicit FCM acceptance would no longer be required. The clearing house would still need to quantify the risk on the trade and ensure that the FCM had sufficient collateral lodged. However if this was successful, then the FCM would merely need to be notified of the trade.

In conclusion

An industry that has seen significant transformation over the last few years is clearly still in an exciting and dynamic state as the market evolves to accommodate financial reform, and the changes already seen in the rates and credit worlds continue through to foreign exchange and onto other asset classes.

Smart Technology

Is **Not** Just for Teenagers... Corporate Treasurers Like It Mobile Too...

Mobile payments are starting to gain momentum and appeal amongst large corporates

Mobile payments is a hot topic at the moment with many people questioning its future and how best to benefit from it. Earlier this year, Apple Chief Executive Tim Cook revealed he was intrigued by the issue amid rumours that the firm's next smartphone will give users contactless mobile payment functionality.

Apple's Cook isn't the only one to have recognised the potential. An area once dominated by individual retail consumers, mobile payments are starting to gain momentum and appeal amongst large corporates, with an increasing number of multinationals demanding such services.

The global banks that have identified this opportunity have been quick to seize the moment and increase revenues and levels of competitive differentiation, bolstering their already impressive array of services and market share. For many global banks, transaction banking and cross-currency payment services remain one of the most profitable and low-risk business services offered to clients.

With cloud technology and Software-as-a-Service (SaaS) gaining significant traction amongst many international corporate treasuries and payments departments, global banks are being forced to keep pace. As a result, a two way relationship between the Global Transaction Banking (GTB) provider (the bank) and the client (the corporate) has evolved.

The main stumbling blocks are concerns about security and integration

So why is mobile banking in the corporate world lagging behind the advances it has made in the consumer arena? Chris Burke, Brickendon Consulting managing director, believes there are several reasons:

"The main stumbling blocks are concerns about security and integration; support issues; questions about internal governance and the integrity of the data," he said, adding that activity has picked up significantly amongst the global transaction banks and their client base over the past 18 months.

The recent interest has come most notably from Asia, a fact that is not too surprising given the take up of consumer mobile technology in the region. According to Google Research, penetration of such technology is higher in Asia than anywhere else in the world. As a result, the Asian corporate client is increasingly illustrating a similar interest.

One reason for this could potentially be attributed to a generational shift in staff age groups across corporate treasuries and payments departments. Another may be the carry-over from the insatiable appetite for all things mobile and cutting edge.

Global banks have started to acknowledge this and some have, and are, taking strategic delivery of such mobile services extremely

seriously as this can represent a fundamental point of entry for some Asian markets. Without a comprehensive and competitive mobile transaction services distribution channel, some regional markets risk being closed to some transaction banking service providers.

As consumer technology has evolved at great pace, the cost of larger scale IT infrastructure is actually decreasing in some segments and the uptake of mobile technology in the workplace is rising fast. Tablet technology is making it possible to perform numerous duties remotely, away from a conventional desk and workstation.

Providing a business with a cost effective means of transacting via a tablet (mobile) can be seen as a great service and a transaction banking differentiator for those prepared to make the investment and change.

Tablet technology is making it possible to perform numerous duties remotely

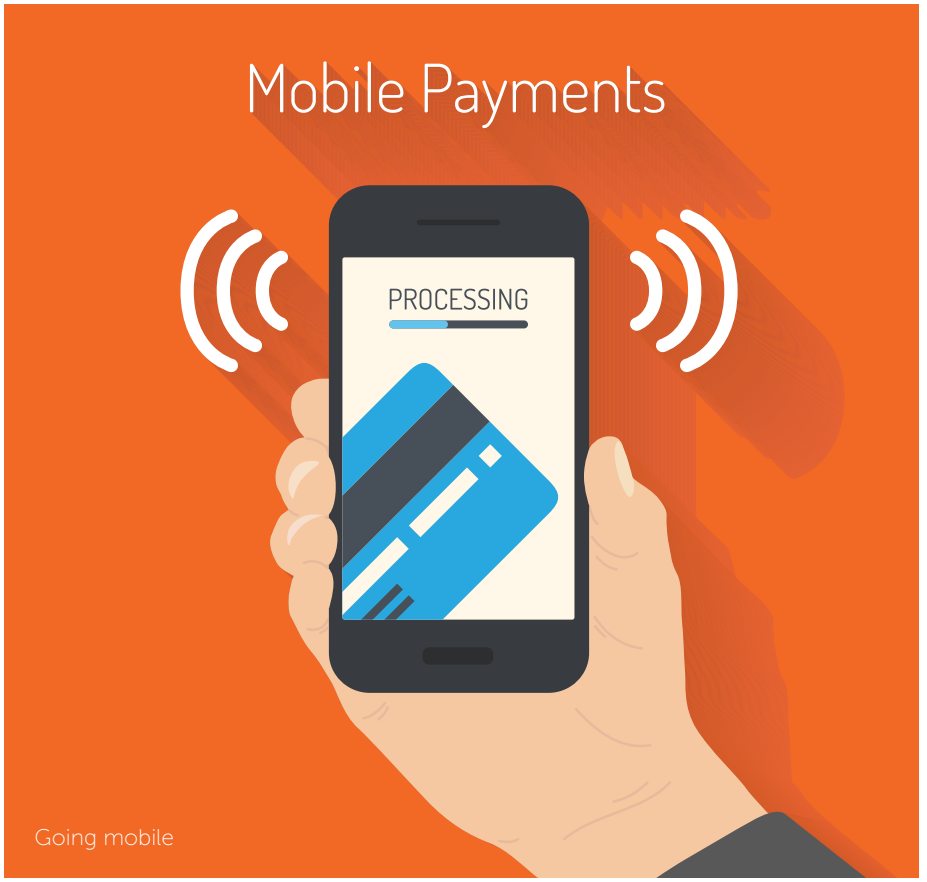
In 2013, HSBC cited that a single corporate customer transferred $427 million in one single transaction using a mobile channel. Clearly it is not just small payments that are passing through the mobile channels. For some banking observers this was enough to confirm that an appetite existed and a future requirement for a dedicated service was confirmed.

The future for innovators goes beyond traditional technology tools however, and thinking along the lines of the development of smartphones and tablets can offer some insights into the way next generation corporate technology services will need to function. Telecom network operators and their architecture and reach are anticipated to play a bigger part in the future of GTB.

Numerous forward-thinking opportunities exist for those that wish to test the first-mover theory geographically and if successful, create a barrier to entry for other participants. Interestingly, some of the emerging markets will become more integrated as a result of such future developments. To immerse banking technology and form collaborative strategic alliances with the global communication suppliers could result in the opening up of significant revenue streams for innovative GTB operators.

In 2011 a study commissioned by Google (Smartphone Research on Mobile Internet and Market Trends) found that the Asia Pacific region had the highest density of corporate treasurer usage of mobile/tablet treasury services. The study observed that 14 per cent, which is low compared to personal (retail) banking usage, considered themselves to be frequent mobile treasury service users.

The use of mobile treasury services does interestingly vary depending on industry sector. Aerospace and chemicals are seen as the early adopters of mobile transaction banking and treasury



Going mobile

technology. For global banks with a deep and diverse client-base, this can be insightful information and can determine the alignment and development of such mobile services. In time, it is anticipated that more industry sectors will follow suit and those transaction banking service providers that execute a degree of forward thinking can strategically position themselves as market innovators and in turn shape the direction of expectations amongst the corporate user-base.

Forward thinking banking service providers can position themselves as market innovators

To progress towards this opportunity and capture the lucrative and low-risk transaction banking mobile payments market and expand it around the world, an effective and advanced technology solution needs to be designed and implemented.

What Next
for Computer Processors?

By 2020 it is predicted that there will be 40 billion transistors in a semiconductor, compared with just 40 million in 2000. To put it simply, more transistors means more data processing capacity, which when put into a personal computer, helps contribute to a faster, more efficient machine.

More transistors means more capacity, which means faster, more efficient computers

The claim comes from Intel co-founder Gordon E. Moore, who estimated that the number of transistors on integrated circuits doubles approximately every two years. He based his prediction on previous observations, and so far it has proved true, with every indication it will continue along this linear line for another five years.

However, despite clever advancements in design, physical and manufacturing limits will at some point kick in and stop the law as quoted from continuing forever. If however, Moore's Law is taken to include not just silicon based semi-conductors, then it is conceivable it may continue for many years to come based on alternative technologies.

In this article we identify the research taking place into computer processors for the future; the current roadmap for silicon semi-conductors; and the alternative technologies that may replace them.

Silicon and Beyond

Today's processors are made from silicon components, but in reality silicon is a poor conductor of electricity. In order to achieve the speeds of processing we have currently, the silicon is combined with small amounts of other elements such as phosphorus, arsenic and boron to improve conduction. Unfortunately, while all of these help increase speed, they also raise heat production, which is a major limiting factor.

Modern commercial processors often run at 2, 3 or 4GHz. However, processors have been demonstrated at much faster speeds but only by being kept in absolute zero temperature conditions. Intel and others have conducted research into using alternative materials for semi-conductors. An inherent problem with using chemical elements alone is that there are only a finite number of them available. The alternative is to use alloys to find very efficiently conducting materials that can still be manufactured into transistor size objects. Processors with alternatives to silicon have been tested and shown to be in some cases five times faster and use a tenth of the power.

IBM and others have also been researching the use of graphene in transistors. It has been demonstrated running at speeds of 100GHz or more, but there is still a lot of work to be done before it could be truly commercial.

Reliability is an issue, but it is clear they will have niche uses

Plastics are another material being researched. Although most plastics are insulators rather than conductors, there are some that have been found to conduct as efficiently as silicon. Plastics have the advantage that they are cheap and can be 'printed.' Reliability is an issue but it's clear they will have niche uses, such as for circuits in flexible screens.

Memristor

The key part of a processor is the transistor, but there is now a new kid on the block – the memristor. Memristor is short for Memory Resistor. Its resistance increases when current is passed one way through it and decreases when current is passed the other way. In addition, when the current is switched off the memristor remembers its resistance. Memristors can be manufactured incredibly small and put into a chip in very high density. The obvious use is as part of a memory chip and it will be used in the near future for this purpose, however it also has potential to be used in processors.

As well as being used for storage, Memristors could be used for a processor's logic gates. Theoretically, both processor and memory could reside on the same chip, providing massive performance gains over separate processor and memory chips. Memristors are also more energy efficient than other components.

Without doubt this is one technology that we are likely to see in some form in the real world environment in the near future.


DNA

Carbon Nanotube technology

Carbon nanotubes are layers of graphene rolled into a cylinder. Researchers at Stanford University have built a computer where the Central Processing Unit (CPU) is entirely made from carbon nanotubes rather than silicon. The processor only has 178 transistors and is therefore very slow at calculations, however it has been compared to the 1970's silicon-processor technology. We have come a long way in processor power since then and forty years from now carbon nanotube technology could be much in use.

With a specific design of nanotube it has been shown that the transistors are faster and more energy efficient than any other material including silicon. They also appear to generate far less heat than silicon technology which is one of the limiting factors in the fastest processors today.

Bio-Computers

Another interesting theory that is slowly becoming a reality, is that of bio-computing. This involves using the inherent complex structure of DNA in biological systems for computational purposes.

Although in its infancy, a team from Stanford University have created a biological transistor. The transistor is the essential building block of all modern computers, with silicon processors today containing millions of them. In the biological version, enzymes are used to control the flow of a specific protein along the DNA molecule.

The same team have already developed the ability to store data in DNA and to transmit data from cell to cell. In principal, these are the requirements to build a computer, but practically, it is still some years away. In order to use this technology for normal computing purposes, further work would be required as the cells themselves would need to be interfaced with the outside world in order to provide input and output.

Quantum Computing

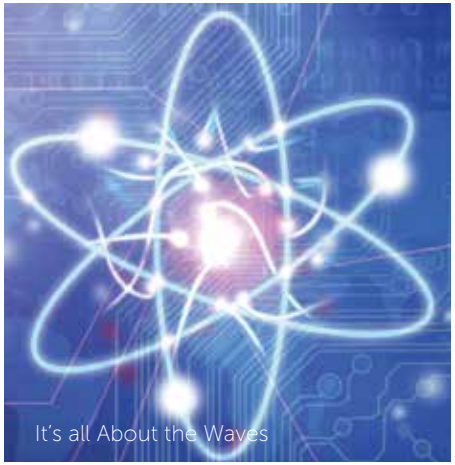
Quantum computing is a much discussed new way of providing computer processing. Many claims have been made about its abilities to process at a much greater speed than conventional systems.

In a traditional processor, any bit of data can only be in a condition of 0 or 1 (on or off). From this, combined with the use of logic gates provided by transistors, it is possible to provide the incredible computing power we see today.

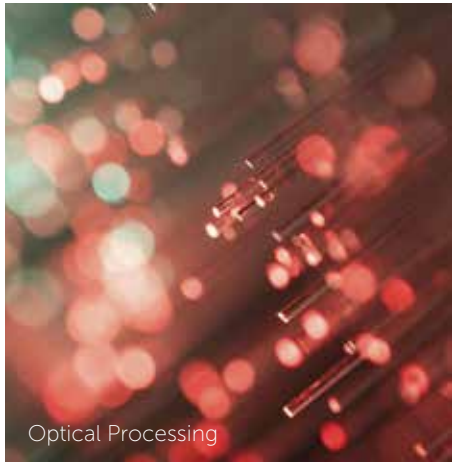
Quantum computers use quantum bits or so-called 'qubits'. These bits can be in a state of 0 and 1 simultaneously. This means that for some types of processing a single bit can effectively be used more than once as it can be in more than one state at a time. This has interesting implications for parallel processing where one calculation can be spilt into multiple separate parts that can run in parallel some or all of the time.

The first theories of quantum computing appeared in the early 1980's. In 2009, researchers from Yale University built a very basic quantum computer. In 2011, a Canadian-based company D-Wave released what it claimed was the first commercial quantum computer, the D-Wave One. This had a 128 qubit processor and purchase cost was estimated to be $10 million. This was followed by a 512 qubit processor machine, the D-Wave Two.

However, there is some controversy about whether these machines are truly quantum computers and how much of an increase in processor power they can provide over a conventional machine. A number of tests have been run on these machines and the latest results seem to suggest that there is some level of quantum computing occurring. The results depend on the type of tests being run. Some calculations will not be quicker simply because they can't be designed to take advantage of the quantum computer's ability to have bits in multiple states at once.



It's all About the Waves



Optical Processing

Some scientists in this field remain doubtful that these are truly quantum computers as they believe there are further design hurdles to overcome before true quantum processing can be achieved.

In May 2013, NASA, Google, and the Universities Space Research Association (USRA) launched a Quantum Artificial Intelligence Lab at the NASA Advanced Supercomputing Division at Ames Research Center in California with the installation of a D-Wave Two machine.

Quantum computers are likely to remain at the high end of the technology stack for some time to come. Many of the processing benefits of these machines lend themselves to use in the scientific research world where large complex parallel processing tasks are often required. In a normal business context, their most likely use would be for processing so-called 'Big Data' as part of ongoing business intelligence work.

Optical Computing

Optical processing involves using lasers to produce photons of light which can then simulate the action of bits of data in a silicon system. Research has been ongoing for many years into the possibilities for optical processing. It is a logical avenue as nothing travels faster than light.

Unfortunately though there are difficulties in miniaturisation of the technology and its reliability. There may be a tie in with quantum computing as these two technologies could be blended together to use the advantages of both.

Current research is mainly around converting various computer elements into optical versions, which can then be fitted into a conventional system. However, in these systems the optical data must be converted to the digital version at some point and at that point the system will slow down and reduce energy efficiency. It is also unclear how much of an improvement in performance a complete optical system would have over a conventional one (assuming it was not quantum based as well).

Summary

The demand for processors shows no sign of abatement and processing devices are appearing in more and more products. Only a few years ago no car had an on-board computer and now, some have up to 50 processors inside controlling everything from engine efficiency to the windscreen wipers. Processors are appearing in more and more consumer goods and finding new ways to make our lives easier.

The use of silicon to produce faster and smaller semi-conductors will continue for a few years yet, but there are finite limits to the size of transistors and the manufacturing methods used to make them.

It is encouraging to see so many different research areas being investigated for future alternatives to the conundrum of the finite lifetime of silicon semi-conductors. Which of these technologies or combination of technologies comes to fruition is difficult to predict and will be based on costs, demand, manufacturing processes and reliability.

Innovation in Testing

Removing Redundancy From Every Angle

Duplicating a job that has already been done is not something anyone wants to do, and particularly not when testing software. However, duplication, known in this instance as redundancy, is something that is a big issue in the testing arena, costing businesses large amounts of wasted money, time and resource.

If implemented correctly, exploratory testing can provide considerably wider coverage

Traditionally, exploratory testing methods are unstructured and dimensionless, taking more time and effort than needed, and resulting in duplication, incomplete coverage and difficulties in defect management (identification, analysis and resolution). As logic of test design and scope are not well-documented it is difficult to share the knowledge gained during the testing process.

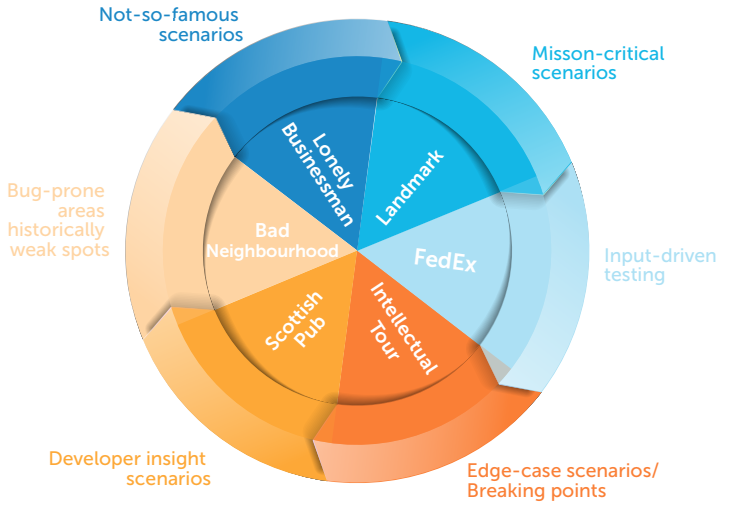
For these reasons, traditional exploratory testing is considered to be a poor long-term investment for many organisations. However, if implemented correctly, exploratory testing can provide considerably wider coverage and reveal different levels of product quality.

To address this issue, Brickendon consultants have analysed, adapted and customised a testing solution devised by James A Whittaker in a bid to address these issues and make testing a more complete and rounded process.

The Brickendon Exploratory Testing Solution (BETS) is a 360 degree testing programme, made up of six different sections (the names are as given by Whittaker):

- Landmark Testing is driven by the identification of landmarks or mission critical functions of the application, such as trade execution or client selection, and is aimed at exposing the defects in the most important and frequently used business cases. It focuses the testing on landmarks or critical functionalities of the application outlined by the project management or business team. The results give an assurance for day-to-day business cases.

Brickendon – Exploratory/Break Testing Methodology



360 degree testing

- FedEx Testing is an input-driven testing method, which focusses on a specialised set of trade/application data inputs. The methodology checks how they flow through the system, and how they appear as an output. This type of testing exposes the defects that are specific to certain trade/data input flavours. The results provide an assurance for solid test coverage.
- Intellectual Tour Testing is driven by edge case scenarios and focuses completely on breaking the system with negative and extreme test inputs. The aim is to expose the breaking points and push the boundaries of the system, with the results giving an assurance for a solid and durable application.
- Scottish Pub Testing is driven by developers and focusses on their areas of concern. It ensures a new dimension to testing and exposes the defects which are outside the thought range of the testing team. The results of this testing will avoid any surprises and will help the development team achieve the best quality application.
- Bad Neighbourhood Testing is based on statistics. It focuses on the areas which have historically been very weak and more prone to bugs.
- Lonely Businessman Testing focuses on testing the areas which are usually given low priority. Defects in these areas can sometimes prove very costly as the impact of a problem is not always fully realised until it has occurred. As a result, this type of testing is essential and ensures robust testing.

During the course of the testing process, all results – both positive and negative – should be recorded in the test/defect tool, enabling the outcome to be easily returned to, examined, and learnt from, at a later date.

This solution is not a replacement for structured formal testing, rather a complementary process

This solution is not a replacement for structured formal testing, rather a complementary process that provides a completely different dimension to testing that is not addressed in formal testing.

BETS is an innovative solution, which removes the risk of redundancy and ensures thorough test coverage without the added risk of extra costs and time. By partnering with all people involved in the IT chain, from developers right through to business analysts, production support and project managers, the quality of the testing is elevated to the highest level.

Most importantly, the detailed documentation of test results and problems enables efficient defect analysis and fixing, which can be used as lessons for future cases and serve as a long-term investment for the organisation.

Bitcoin Misses Out
on Word of the Year, But Could Be Investment of the Year

January 2014 was an important month for Bitcoin in the UK as a British university became the first public higher education institute in the world to allow some students to use the digital currency to pay their tuition fees and the UK arm of online shop eBay said it will allow Bitcoin trading on its site.

The cryptocurrency, so called because it uses cryptography to guarantee its security, first appeared on the radar in 2009 after an anonymous creator is believed to have buried 21 million virtual coins online. Since then, it has developed into a much spoken about phenomena, being shortlisted for 2013 Collins Dictionary word of the year, and according to Forbes Magazine, being the best bet to have made money from a $100 investment last year.

There were about 11 million units in existence as of January 2014

So what exactly is Bitcoin and what is the attraction? You can gain ownership of Bitcoin in three primary ways: by buying it; by being paid in it in return for a product or service; or by making it through a process called Bitcoin mining.

Mining requires complex computing problems to be solved. As each block of coins gets mined, the problems become harder and harder to solve, increasing the requirement for computing power. This in turn limits the supply of coins – there were about 11 million units in existence as of January 2014 - and adds to their attraction and value.

Once you hold (not physically speaking) your Bitcoins in your virtual wallet, you can use them to make purchases – the currency is accepted by thousands of online merchants worldwide, including Richard Branson's Virgin Galactic - or to buy and sell other currencies through various exchanges.

Bitcoin Mining

It is widely believed that the first Bitcoin trade for goods and services took place in May 2010, when a programmer living in Florida sent 10,000 Bitcoins to a volunteer in England who ordered two pizzas for the programmer at a cost of US$25. However, it took until 2013 for the currency to start to be accepted as a form of payment by some mainstream services and many restrictions still apply.

For example, while eBay UK has agreed to allow merchants to trade Bitcoin and similar currencies, it will only accept such transactions in a special 'virtual currency' category. Meanwhile, Cumbria University is only permitting Bitcoin payment by students attending two new courses examining the role of complementary currencies, describing the process as 'learning by doing.'

Bitcoin's value is famously volatile. In January 2013, one Bitcoin was valued at around $14. In November 2013, that value peaked at more than $1,000, but fell back to just above $500 in December. While such extreme volatility may be damaging to a currency, it is an attractive proposition for speculators, meaning that for those prepared to take a punt, there is money to be made. (Though actually turning your Bitcoins back into a currency you can spend on the high street is not a simple process.)

There are a variety of different exchanges where you can trade Bitcoin - in November BTC China overtook Japan-based Mt.Gox and Europe-based Bitstamp to become the largest bitcoin trading exchange by trading volume - but due to the lack of regulation they fail regularly, taking client Bitcoins with them. As a result, Bitcoin prices are fragmented and vary widely across exchanges.

While Bitcoin uses cryptography to guarantee its security, the non-traceable nature of the transactions means that it has often been associated with illicit activity, most notably with the online illegal drug market called Silk Road, which was shut down by the FBI last year. The European Banking Authority has also warned about the potential risk of using Bitcoins and China, the world's second largest economy, has banned its banks from handling Bitcoin transactions, saying it has no legal status and should not be used as a currency.

Like precious metals it can be mined, but unlike precious metals you can't hold it in your hand

For the time being Bitcoin remains an anomaly: like precious metals, it can be mined, but unlike precious metals, you can't hold it in your hand. It's real, in that some merchants and services will accept Bitcoin as payment, but it's virtual, in that it exists only as a series of entries in a global data structure.

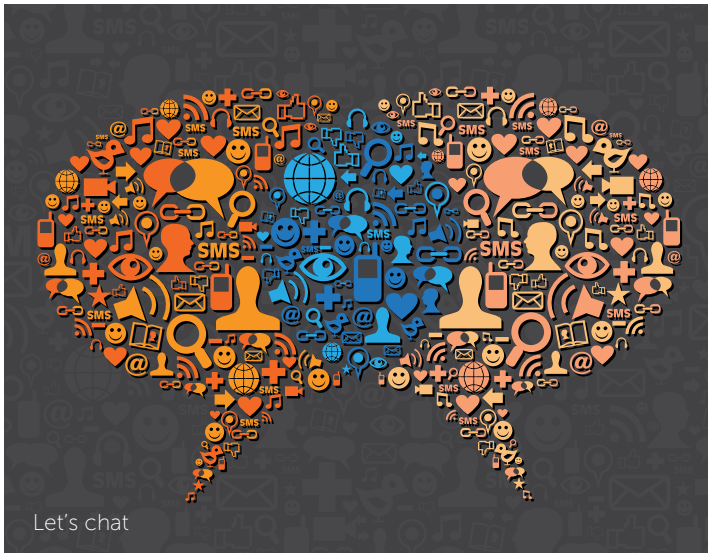
So, until Bitcoin can be used to top up your Oyster Card, buy a Coke, or is accepted by your friends when you pay them back for a restaurant meal, it is likely to remain just a playground for four types of people: tech-heads fascinated by the maths; traders trying to make a fast buck; a few people trying to buy illegal drugs; and libertarians who see its use as some kind of political statement, a method of escaping the scrutiny of government.

Bank of America's prediction that Bitcoin may emerge as a 'serious competitor' to traditional money providers (Bank of America Merrill Lynch Bitcoin report Dec. 2015) seems a long way off.

Five Things You Should Know About Bitcoin:

1. Bitcoins are essentially secret numbers transferred from one software client to another using key cryptography
2. They are traded on international exchanges, which determine their value according to demand, as well as being accepted by a range of online retailers
3. It is not unusual for value to fluctuate as much as 20% in one day
4. Bitcoins are not controlled by any bank or government
5. The virtual currency is starting to attract the attention of venture capitalists

Social Networks
It's Not All About the Chat



It's all about effective communication

While social networking may be a relatively recent phenomena, communicating in such a way is not. Almost 2,500 years ago, Confucius is reported to have said "...tell me and I will forget, show me and I may remember, involve me and I will understand....."

The Chinese philosopher was obviously not referring to any of the popular social networking sites such as Facebook, Twitter or LinkedIn, however the principle remains the same. It's all about effective communication to successfully achieve a goal, whether that is keeping in touch with friends, sharing a piece of information or advertising an opportunity.

As Facebook, one of the best-known social networking sites with almost 1.2 billion active monthly users, celebrates its 10th birthday, a new trend is emerging in the way such sites and tools are used. It is no longer just about keeping up with friends, social networking sites are being used by businesses as a way to interact internally with the aim of enhancing employee engagement, improving internal communication, promoting team camaraderie and disseminating information on a global scale.

An internal network offers the opportunity to trade skills

According to industry experts, effective internal communication is one thing that can't be compromised when striving for a happy and effective workplace. By setting up an internal network you are generating the ability to share knowledge, expertise, thoughts and innovation in an efficient, consumable and targeted manner.

"Internal Facebook is a very innovative concept which helps simplify communication across an organisation," said Bala Ethirajalu, a manager at Brickendon Consulting. "It can help motivate employees to participate and engage in a wide variety of discussions within the organisation."

According to Ethirajalu, an internal network is a great platform for employees to share experiences and success stories with just a post. "When you 'like' your colleague's idea or thought, it doesn't require a huge effort making emails or phone calls to pass on your opinion," said Ethirajalu. "It's just a click away."

In this way, internal networks can help when it comes to sharing ideas and problem solving. For example, one UK-based defence contractor was having trouble designing auto parts that would perform well in desert conditions, so the company started a social network to allow employees to share ideas and they came up with two successful designs.

Moreover, an internal network offers the opportunity for people to trade skills with a view to enhancing a particular project. Employees can post a copy of their CV or summary of their skill set and experience to a communal location so that other employees can search for experts for specific tasks or ask advice from people who have worked on similar projects. They can also post questions, a concept which is becoming increasingly common in an IT context, whereby developers share knowledge about coding, allowing significant development barriers to be overcome more quickly than would otherwise be possible.

However, the use of tools such as Bloomberg Chat, which allow person-to-person instant messaging, is expected to decrease going forward, amid increased scrutiny in the wake of investigations into the possible rigging in the foreign exchange market and Libor. Earlier this year, Goldman Sachs said it plans to stop traders from using certain chat messaging services to protect internal conversations. JP Morgan Chase and Deutsche Bank have already banned online chatrooms.

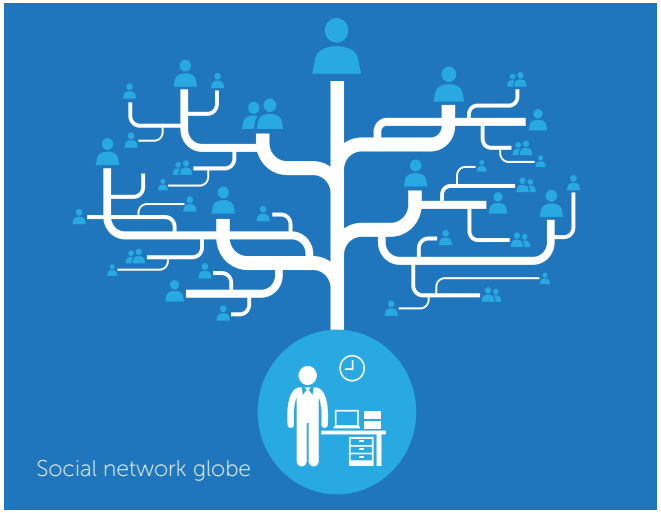
Internal networks can however act as an aid for promotional opportunities within a company, showcasing both what projects are being worked on and what skills employees have to aid those projects. So-called innovation platforms can also be set up for employees to propose ideas, which can then be discussed, improved or voted on by other colleagues. In one large investment bank, such an initiative led to a project that generated profits of more than $10 million.

Chris Hambly, an online and e-learning business specialist, is a big advocate of social networks in the workplace, saying that companies that do not embrace the idea are missing out on an opportunity to use their employees as brand ambassadors. He believes that regulated use of social networking helps shine a positive light on the company.

Furthermore, the internal use of social networks can help break down the traditional communication barriers within large firms, giving some more junior employees confidence to liaise with more senior colleagues through an informal channel.

As well as positively portraying your brand and boosting staff morale, social networking can also be used as a recruitment tool. A study by the Institute for Employment Studies carried out in August last year found that 45 per cent of HR decision makers already used social media tools in recruitment and 16 per cent said they were planning to in the future.

So, even if you're not a Facebooker in your personal life, if you want your business to remain on top of the game, it's about time you embraced the concept in your work life and turned your employees' digital enthusiasm into an asset for your firm.



Social network globe

Forget Practice,
It's the Stats That Makes Perfect

England cricket fans could be forgiven for turning the page quickly when faced with any cricket-related chat given their team's dismal performance in last year's Ashes Test. However, Brickendon consultant Sajeel Chaudhry believes the statistical techniques employed to help large corporations assess, quantify and improve their performance could be used to up the game of Alastair Cook's fast bowlers.

The aim is the same: to see where the potential is for greater efficiency

"The techniques used to understand patterns behind data and make statistical inference can be applied to many situations whether it's a technology upgrade project within a business, or the performance of a sportsperson on the track or field," said Chaudhry. Alongside his Brickendon work, Chaudhry is studying the factors that influence the speed of a cricket ball when it leaves the bowler's hand using transferable methodologies such as ANOVA (Analysis of Variance), t-tests and Multiple Regression.

By using these statistical techniques, a cricket coach is able to identify (statistically significant) variables that impact release speed, as well as the magnitude of the impact of those variables and explain their strength of correlation with the release speed.

These, and other techniques, can, according to Chaudhry, be used in any industry to understand the variation in performance and statistically relevant factors that are associated with it. For example, in the finance, banking or technology world, an agile team may be optimised in the same way by establishing which factors consistently contribute to increasing efficiency.

Agile teams use 'velocity' as one of their performance variables, which relies on many other independent variables, including engineering practices, product owner customer relationship, team dynamics and bug fixes. By using statistical analysis, the variables that best predict the desired performance can be deduced and focussed on.

In addition, advanced regression analysis is often employed in the banking and finance sector in the model calibration process to understand the accuracy of parameter estimation, which can explain the difference in predicted and actual figures (eg. option prices and stock prices). Time series analysis, another technique based on regression analysis, is also widely used in portfolio optimisation and asset allocation processes.

Risk management, and in particular Value-At-Risk (VAR) is another area where a variety of statistical methods are used.

Whatever the subject, the principle and aim is the same: to see where the potential lies for greater efficiency, whether it's speeding up the code-writing process in a new technology project, testing a new software release or ensuring different teams are all working towards the same goal.

In short, we are always searching for a more scientific way to understand the relationship between factors that influence our outcome or goal.

There are four distinct stages in a fast bowler's action (Bartlett et al, 1995; Liebenberg, 2007) which can be broken down into further elements. These are:

1. the run up (speed, length, rhythm)
2. the pre-delivery stride
3. the delivery stride (back-foot strike, front-foot strike, stride length and alignment, front-knee angle, shoulder and hip orientation, non-bowling arm, trunk, the ball release)
4. the follow through.

England could do worse than take some advice from Brickendon.

Combine these with the three main types of bowling actions (side-on, front-on and mixed), and it is not surprising to see why researchers are unable to reach a consensus as to the leading contributors to the increase in release speed of a cricket ball. Given the short time frames and cycles, a coach is unable to optimise all of the variables that contribute to an increase in the release speed of a cricket ball.

So, if England want to avoid another 5-0 Ashes whitewash, they could do worse than take some advice from Brickendon.

Past research has shown that:

- If you allow the arm to travel through a greater circumference before the ball is released, there is a (statistically significant) increase in the release speed.
- The knee angle of the front foot at point of release significantly impacts performance, with an angle greater than 150 degrees contributing to greater force.
- A moderately positive correlation is found between the braking force and the knee angle (however the causal relationship hasn't yet been established between the braking force and the knee angle.)

Contributors

James Baker

Chris Burke

Sajeel Chaudhry

Balaprasanna Ethirajalu

Andrew Jarvis

Christian Marshall

Claire Shoesmith

Nathan Snyder

Ellie Suh

Brickendon provide consultancy services to solve the challenges, both internal and external, faced by businesses operating in the financial markets.

Today's business and trading environment is ever gaining in complexity. Over the last few decades, we have seen that the ability of organisations to remain competitive in the overcrowded financial markets is critical. An increasingly challenging regulatory environment has also made it essential for market participants to have a clear understanding of changes in order to drive their own strategic vision.

At Brickendon, we undertake proactive research in order to be able to respond to industry developments in the financial markets as they happen. We constantly perform in-depth analysis and evaluate the operational implications in banking and trading organisations. We are committed to maintaining high-level research integrity in order to provide independent and first-class solutions to our clients.

Contact us at:

107 CHEAPSIDE
LONDON EC2V 6DN
T +44 (0) 207 397 3760
E INFO@BRICKENDON.COM
W WWW.BRICKENDON.COM