Emerging technology trends
The road to the bank of the future
Preparing for the next wave of reinvention is largely being driven by a rapidly changing technology landscape. Banks seeking to understand how they should transform and invest in programmes of work to activate new capabilities, need to consider technology innovation and trends.

At EY, we have a view of what may shape this future.

“Disruption is not happening at the periphery of Financial Services; it’s pervasive. Unlocking the potential of tomorrow’s technology must begin today and go straight to the heart of business strategy.”

Anita Kimber,
IT Advisory Leader, Asia – Pacific

“The next decade in banking will see both evolution and revolution. Banks must reinvent themselves, not just to respond to the pressures of today, but to be flexible enough to adapt to the world of tomorrow.”

EY Global Banking Outlook: Transforming Banking for the Next Generation, 2015
Rapid transformation ahead

Banking has gone beyond the digital tipping point. The sector is gathering momentum towards rapid and wide scale transformation, driven by both fintech disruptors and a responding wave of innovation investment from incumbents.

The challenge for banks is to understand the technologies that are reshaping and will continue to reshape the future and how to strategically invest now. The way consumers think about money and banking is already changing dramatically. Financial services workers are also empowering themselves with technology, allowing them to work more effectively and deviate from traditional working hours and practices.

In response to increasing opportunities and threats posed by emerging technologies and competition, banks are spending a high proportion of their IT budgets on new investment. In 2015, total bank IT spending across North America, Europe and Asia-Pacific will grow to US$196.7b, an increase of 4.6% over 2014. Much of this will come from Asia-Pacific where growth of up to 5.6% ($70.3b) is predicted. That said, the US should not be discounted. Nine of the top ten US financial services institutions have technology focused innovation centres. Many countries are not only investing in technologies for short-term use, but in researching and developing technologies to support long-term strategies.

At the same time, fintech entrepreneurs are disrupting the market with new products, capturing the hearts and minds of early-adopter consumers and partnering with high-powered financial services players. Fintech enterprises think and act differently to traditional financial services businesses; technology focus and the ability to work outside traditional boundaries makes them super agile.

To leverage future technologies effectively and competitively, banks need to decide where they intend to differentiate. This differentiation strategy will create a paradigm to define IT investment. When this direction is in place, bank leaders will understand their own technology adoption horizon. Currently, banks are pursuing competitive advantage through three paradigms:

- Enhancing and extending enterprise efficiency through technological transformation
- Improving customer propositions for greater revenue
- Changing culture by providing resources to increase collaboration and innovation

Once the strategic roadmap is in place for technological investment, banks have a wealth of new technologies to consider...

“Making investments in new technologies before they are fully proven is increasingly becoming a differentiator for banking services providers.”

Meredith Angwin, Partner, IT Advisory, Oceania Financial Services

Navigating the adoption and investment horizon

The horizon below, profiles the technologies we believe most likely to confer competitive advantage over time, considering proliferation in the market, costs and usefulness of application in the average bank’s operating model today.

<table>
<thead>
<tr>
<th>Support</th>
<th>Build</th>
<th>Future proof</th>
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<tbody>
<tr>
<td>Short term and quick wins</td>
<td>Tactical shifting</td>
<td>Targeted tactical shifting</td>
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<tr>
<td>These technologies have proven success in banks and industry. They can support the existing organisation and are easy to adopt.</td>
<td>These technologies have the potential to become necessary to the bank of the future. They are breaking new ground for the possibilities across the enterprise.</td>
<td>Immature yet highly promising technologies that are likely to change the future of banking.</td>
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Thinking out to the horizon will enable banks to start developing new workforce management strategies and regulatory and compliance frameworks, that will be required to leverage future technologies.

New and emerging technologies will change the profile of workforce skills and capabilities, creating demand for currently scarce IT and technological skillsets. The worldwide competition for qualified talent in science, technology, engineering and mathematics is at its highest level since the global financial crisis. According to Qualigence, by 2015, 60% of new jobs will require skills that only 20% of the population possess.²

To avoid paying a premium for scarce resources, banks will have to both invest in reskilling their own staff and work with education and academic providers to ensure the workforce of the future have the necessary skills.

Future technology is also likely to require a high-degree of compliance management. Many new technologies will require additional government regulation, others, such as the internet of things and quantum computing, will require government support.

2. Source: Talent Acquisition Forecast 2015, Qualigence, 2014
**Today**

## Certain and mature technologies

### Cloud computing

Clear policy and guidelines will help financial institutions avoid breaching regulations, when using cloud services. APRA already has a standard for industry, regarding the use of cloud. As regulatory and data-protection requirements change, banks will have increasing opportunities to scale back costs, by managing back-office functions through a cloud computing service arrangement.

**What we are seeing in the market:**
- A prominent US fintech’s interactive cloud platform solutions are powering Australian wealth management and integrated small lending fintech firms
- The Australian online division of a global bank, has built a virtualised “bank in a box” on a private cloud solution, streamlining back end operations and creating new operational flexibility

### Big data

The amount and types of readily available customer data are expanding rapidly. Banks are using big data to develop insights to fine-tune systems, inform credit and risk decisions and develop new products and services.

However, making sense of the volume and variety of this information is a challenge. Advanced analytics software can identify patterns hidden in massive data flows, automating a wider range of knowledge tasks. In addition, banking data can create new revenue streams by selling sanitised information on spending patterns or activities to third parties.

**What we are seeing in the market:**
- A Big 4 Australian bank uses information gleaned from customer transactions to determine the right product, pricing and financial advice for the customer
- Another Big 4 Australian bank has advisors feed analytical questions phrased in plain English into a cognitive computing software, which uses customer data to create suitable product recommendations for individual clients

At the same time, banks are facing increased demand to provide their own information, with regulators requiring increasingly frequent submissions of very granular data.

### Cybersecurity

Mounting digitisation and connectivity means cybercrime is on the rise. With employees often plugged into insecure Wi-Fi networks and using their own devices, business data is increasingly vulnerable. As cyber-attacks become more sophisticated, data breaches are growing in size and frequency; the economic toll is rising. The Center for Strategic and International Studies (CSIS) estimates that digital crime and intellectual property (IP) theft currently cost between US$375b and US$575b per year – eclipsing the annual GDP of most nations.

Although a portion of cyber-threats come from “hacktivists”, the most concerning threat for financial institutions is from organised cybercrime. In future, emerging technologies such as blockchain and quantum computing will pose security threats. Banks must consider their options and opportunities now.

**What we are seeing in the market:**
- A global security company has recently investigated with Interpol, the theft of over a billion dollars from global financial institutions including those in Australia
- In July 2015, large Australian banks and the Australian government held a summit to discuss cybersecurity, with intelligence sharing, skills and workforce development high on the agenda
Disrupting internally

To keep customers and sustain profitability, banks must evolve in line with their strengths through internal transformation. This will involve investing in disruptive technologies and creating a culture of innovation.

Tackling enterprise efficiency through technological transformation
Banks must transform their IT infrastructure by changing how they use technology to improve process efficiency and effectiveness. Aging infrastructure requires manual interventions for data aggregation and analytics, preventing the uptake of near and distant technologies. Therefore creating the right foundations is essential; banks need to think about the problems they face today, while also picturing how they want to operate tomorrow.

Banks should also look beyond merely complying with regulations and begin to use these requirements to their advantage, to support changing internal processes. Also most post-financial crisis regulation becomes business-as-usual, banks may finally be able to think strategically about how technology and data can transform their internal processes.

Improving customer propositions for greater revenue
Customers are interacting with brands through mobile devices more than via PCs. They are also using mobile more frequently to make purchases. As these mobile capabilities become more prevalent, customer expectations will rise in line with them. Increased mobility and the influence of social media, means technology users are expecting and demanding cloud and mobile technologies as staples in their daily lives.

According to the EY Economist Intelligence Unit, as early as 2013 almost 80% of companies said their customers were changing how they access goods and services. But only half of these companies were responding by adapting their pricing and delivery models. Banks need to be ahead of the curve and be at the forefront of the latest styles of customer interactions.

Near Horizon

Different maturity levels, some commercial application, rapid adoption shortly

**Internet of Things (IoT)**
Underpinned by cloud and analytics, IoT will give banks an unprecedented level of insight into their customers’ real-time needs, enabling them to tailor advice, products and services at an individual level.

Beacons are one of the first opportunities for banks to use IoT to drive business outcomes

**Augmented reality (AR)**
The ability to merge the digital and physical realities will transform customer experiences, integrating banking seamlessly into everyday interactions. Banks must examine their processes for points where immersive experiences, interactive touch points or custom apps can both improve the customer experience and create new sales opportunities.

**Context-aware computing**
IoT and AR combine to provide context-aware computing. This technology uses situational and environmental information about people, places and things to anticipate immediate needs and proactively offer enriched, situation-aware and usable content, functions and experiences.

**What we are seeing in the market:**
- An Australian bank uses BLE beacons in branches to interact with customers
- A property investment iPhone app from an Australian Big 4 bank, is using augmented reality insights to help consumers make smarter property decisions
- An Australian bank uses context-aware computing in its banking app, which notifies the bank if a customer is at an airport, so that overseas transactions won’t be incorrectly deemed fraudulent

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Disrupting internally

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Quantum computing

The incredible power of quantum computing will have a massive impact on big data, making video and image analysis fast and relatively cheap. It will also make encryption technologies redundant, requiring banks to build new software security measures to combat this threat.

What we are seeing in the market:
- The emphasis on quantum encryption to secure payment transactions and data is accelerating, to meet the challenges industry will face.
- An Australian Big 4 bank is sponsoring research into quantum computing with a $5m contribution to an Australian university leading this research.

In the future:
- New cyber-security algorithms, based on quantum computing will be essential. Without the implementation of the infrastructure and security framework for the new algorithm, the laggards will be open and vulnerable to cyber threats.

Advanced robotics

Advanced robotics will rapidly expand the number and types of jobs susceptible to mechanisation and digitisation. This is likely to drastically reduce the headcount required to operate a bank.

What we are seeing in the market:
- The partnership between a Big 4 bank and a leading international cognitive computing software has given financial planners access to a cognitive advice solution, to improve advice quality.

In the future:
- A new next generation, emotionally intelligent robot may replace branch staff at a nation-wide telecommunication retailer with cognitive computing technology.
- Humanoid robots will provide in-branch services, offering extended features such as multi-lingual capabilities and rapid approval processing to both improve customer experiences and reduce cost.

Changing culture by providing resources to increase collaboration and innovation

To create an institution that embraces new technologies successfully, banks need to develop a culture that is comfortable with disruption and seeks positive change. The future is likely to require a move to a more virtual workforce, where employees connect to work anytime, from anywhere, and on any device. Remaining office configurations are likely to be highly flexible, while still supporting teaming and collaboration.

These greater levels of autonomy and flexibility are likely to be complimented new means of engaging with talent. Companies are already able to connect to resources on demand, rather than owning them, through tapping into networks of workers and skilled staff through crowdsourcing and freelance platforms.

However many of these developments will create new challenges for leaders. Not only are different skill sets required to manage remote and contingent workers, but existing organisational cultures will be harder to maintain.

In developing the right workforce to support the digital world, banks must arm staff with collaborative tools, implement applications based on user requirements, deliberately encourage mobility and encourage innovation via programs, benchmarks and recognition.

Bringing this to life for an organisation

Executives seeking to promote an innovation culture need to encourage employees to:
1. Challenge – the organisation from the top down to collaborate, innovate and think outside defending the core business.
2. Create – a technology strategy, shifting from short-term thinking to long-term strategic decision making.
3. Incubate – solutions through prototyping and test and validate initiatives through small scale experimentation.
4. Activate – the solution on a commercial scale to capture economic value for the business.
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APAC No. AUNZ00000556  
S1528271  
ED None

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