ANALYSE THIS PREDICT THAT

How institutions compete and win with data analytics

FOREWORD

Welcome to Telstra's latest financial services industry thought leadership report: Analyse This, Predict That.

This report considers how institutions compete and win with data analytics.

While our core needs for money – to save, spend, borrow, invest – may not have changed much over the centuries, the way we interact with financial institutions has, and continues to drastically change. To date, this has been largely due to disruption caused by the 'three-Ds', being:

1. Demographic changes;

2. Digital technologies; and

3. Design of the customer experience.

These are topics that I have comprehensively researched over the past six years and presented in previous reports. This report, the ninth in my series, adds a '4th D' into the mix – data. This report argues that data, as an accelerant of disruption, is setting the financial services industry on a new competitive trajectory.

Just think of Google, Amazon, and PayPal or – more specifically to the world of finance – Capital One or Progressive Insurance in the US.

It's clear that organisations that use analytics extensively and systematically are rapidly out-thinking and out-executing their competitors. Traditional players are swiftly coming to the realisation that they must prepare to adapt their settings for this new competitive landscape – as is evidenced by the speed at which this topic is climbing higher on the corporate strategic agenda.

We are now witnessing the first wave of start-ups and established information services players challenging traditional models with propositions such as peer-to-peer lending, mobile payments, and personal financial management service propositions. At the heart of all these examples is the creative application of data analytics – a catalyst that is providing innovative new ways to satisfy customers' centuries-old core needs.

This study concentrates on data analytics. The report examines, firstly, the major forces in play and how these are re-shaping the competitive environment. Secondly, we report on how financial services institutions are adjusting their strategies and capabilities for this transformation.

We then present research on consumer attitudes toward a range of interactions that can be enabled through data analytics, and analyse the impact these would have on their relationship with their financial services providers.

Lastly, we present a vision for a smart connected financial services world. Here, we both explain the key technological developments and discuss the role that next generation digital communication and media technologies can play in helping your organisation map out its journey.

This research was only made possible by the many generous contributions and insights from numerous leaders within the financial services industry, for which I sincerely thank you.

Rocky Scopelliti
Group General Manager -
Industry Centre of Excellence

Telstra Global Enterprise Services

1.0 EXECUTIVE SUMMARY

In a Smart Connected World, data analytics are having a profound impact on the competitive growth trajectory of the financial services industry.

This is particularly relevant in the Asia Pacific region, which is predicted to be home to two thirds of the world's middle class by 2030 – a staggering 3.2 billion people[1]. This region is also predicted to overtake North America as the largest wealth management market in the world by 2015[2].

Data analytics bring new risks to financial institutions, particularly around the appropriate use of data. Data analytics will require a new consumer engagement model – one that ensures that analytics enhance value whilst also reinforcing the trust that consumers place in their financial institutions.

Business models, operational structures and markets are being disrupted and contested by non-traditional and start-up players unconstrained by proprietary systems, processes and technologies, and able to compete ingeniously with democratised data and open sourced models. These players understand that digital has irrevocably changed how customers expect to engage financial services. Institutions from the 20th century that choose not to adapt, but to rely on what worked in the past, can expect to be comprehensively out-competed.

1. Major Forces Shaping Digital Competition and Growth

There are four key forces altering the competitive growth trajectory of the financial services industry: Personalisation, Network Effects, Cloud Business Models and Open Source Artificial Intelligence based Technologies.

The intensity of competition has, and is anticipated to increase exponentially, as the convergence of digital proliferation and inter-generational wealth transfer makes traditional financial services markets increasingly attractive for new players. We are now seeing these new entrants venturing into the financial services market with increasing regularity. Global investment in FinTech ventures clearly illustrates this trend, with investment tripling from US$928 million in 2008 to US$2.97 billion in 2013. Indeed, FinTech investment is outgrowing overall venture capital growth by a factor of four, with nearly a third going into ventures focused on data analytics and personal financial management. The epicentre market for disruptive innovation includes Generations X and Y, who today are responsible for more than half of all spending and borrowing in Australia (a pattern likely to be similar in most developed nations). We've developed a Competitive Growth Model that highlights where to enter, adapt or be significantly out-competed (see Section 2 – Major Competitive Growth Forces).

2. Strategic Market Gaps Exist – these can either be Closed by Incumbents or Exploited by New Entrants

There's a major gap between the strategic priority of incumbents and their readiness to execute. New entrants are already exploiting that gap. Financial institutions are now making a significant investment in transforming themselves into analytical competitors to close the gap.

We studied 43 financial institutions across the Asia Pacific region. The results indicate a significant gap of 68% in the organisational readiness of institutions to compete on analytics, with only 32% perceiving that they are on the verge of, or ready to compete, using data analytical capability. Further, there was a 17% strategic priority gap identified, with only 83% reporting a commitment to data analytics from their CEO and leadership team. These gaps explain the significant investments – averaging 6% of an organisation's budget in FY14 – being allocated for data analytics projects, with expectations of a resulting performance improvement averaging approximately 6.3%. Clearly, growth is the major incentive for such an investment, with 68% of Sales and Marketing departments now driving the data analytics strategy, requirements and investment programs (see Section 3 – Asia Pacific Financial Institution and Service Provider Competitive Readiness Study).

3. Data Analytics – The Catalyst for Altering Consumer Perceptions

Analytics-enabled financial services, and the experiences these capabilities provide, have the capacity to alter the perceptions of consumers across the Asia Pacific region, as well as to support strategies to acquire, engage or retain customers – whether executed through a branch, contact centre or digital consumer channel.

Our study involved over 3,100 consumers across Australia, Singapore, Malaysia, Indonesia and Hong Kong. The results indicate that in all countries, each of the five digital analytics-enabled service concepts researched achieved high appeal levels, and the nine experience metrics tested demonstrated positive perceptual impacts for each concept. Specifically:

- The results clearly show the value of a personalised digital banking experience (e.g. tools, insights, alerts, recommendations, notifications on saving, spending, borrowing or investing) across the Asia Pacific region, with this concept ranked in the top two most appealing in all Asian markets. Demand for personalisation extends to the branch, with the personalised in-branch experience (e.g. recent interactions, history, context) also ranked in the top three concepts.

- Across all five concepts, consumers indicated that 'Knows me and my financial situation, irrespective of how I use the bank or financial institution' and 'Access to banking experts when I need them through my preferred way to interact with them' experiences achieved strong positive results.

- When it comes to maximising appeal, interestingly, in all countries, the personalised in-branch experience concept appears in the top three concepts. This finding may contradict the suggestion by some commentators that the in-branch experience is dying and will eventually be replaced by the online mode. Instead, it suggests that with personalisation, it can remain a fundamental part of what makes a financial services provider appealing to consumers in the Asia Pacific region.

- When it comes to retention, in Australia, the digital advice concept (e.g. virtual/digital advice access to experts via video, chat, social media) has the greatest impact on customer retention, with a retention factor (satisfaction and advocacy) of 86%. Within the Singaporean, Indonesian and Hong Kong markets, those who would use the personalised in-branch experience gave it a retention value of 92%, 97% and 90% respectively. Malaysian consumers who would use the personalised digital banking service gave it a 95% retention score.

- When it comes to acquisition, digital advice, again, is featured. For Australians, the digital advice concept had the highest acquisition impact (consideration and switching) at 80%. For Singapore, it was 88%, Hong Kong 86%, and Indonesia 93%. In Malaysia, this ranked third at 88%.

- Mobile banking is now heavily penetrated across the region. Hong Kong leads the way with 68% of the population using smartphones to access financial services, followed by Indonesia 64%, Singapore 63%, Malaysia 53% and lastly Australia at 42%.

These results illustrate the significant potential impact of analytics on the design and execution of personalisation strategies, digital tools, insights and advice across channels to acquire, engage and retain customers. However, as these digital services would be enabled by large-scale analytics, it is now becoming clear that modern financial services providers need to have well-developed analytical information gathering capabilities (see Section – 3.3 Analytics-Enabled Concepts and Experiences: Asia Pacific Consumer Experience Study).

4. Pervasive Connectivity and Intelligence for the Analytics-Driven Business

The Smart Connected World where everyone and everything is connected, intelligent and measured.

The emerging consumer environment is marked by high-speed connectivity and pervasive distributed intelligence, and features a better awareness of the consumer's context than ever before. By 2020, it is predicted that:

- 95% of people in the developed world will be connected to the Internet – up from 77% today;

- There will be 4-10 connected devices for every person on the planet; and

- 140 sensors per person.

Intelligence is being built into an expanding range of devices, as well as infrastructure and the environment. Analytics will remove friction from businesses and consumers' lifestyles and deliver substantial operational economic and lifestyle benefits (see Section 4 – Technology for Analytics-Driven Business in a Smart Connected World).

5. Valued Analytics-Enabled Customer Experiences

Cloud technologies connected by high-bandwidth, low-latency networks make the infrastructure and expertise required to harness advanced analytics much more accessible. They create a step change in the ability of financial service institutions (both traditional providers and disruptive new entrants) to deliver the highly personalised, highly contextual, analytics-driven experiences customers now expect.

The combination of the four key forces mentioned in Key Finding 1 Major Forces Shaping Digital Competition and Growth and the democratisation of analytic capability poses a threat to traditional financial service providers. But it also creates a limited window of opportunity for those incumbents who are prepared to move swiftly and embrace this new world. By doing so, they will also be able to exploit their existing advantages over the newer entrants: namely, their unique position of **trust, strong customer relationships** with Gen X and Y and **multiple touch points**.

We show three analytics-driven customer experiences to highlight how embracing an analytics-driven approach can help channels to evolve:

- **Contact.Me:** Combines and extends the vision of a personalised contact centre and intelligent personal assistant, blending an intelligent personalised virtual financial assistant with a physical (but remote) relationship manager through an engaging and consistent interface.
- **Branch.Me:** Turns the branch into an environment for identifying visitors and understanding their intent and engagement preferences so that branch staff (and even branch infrastructure) can deliver personally optimised content and interactions.

- **Digital.Me:** Shows how providers can combine analysis of saving, spending, borrowing and investing behaviours with social analytics and broader market analytics to create online and mobile tools that help customers more effectively manage and use financial services.

This vision of a truly analytics-driven customer experience is underpinned by secure and highly scalable storage of customer data connected to a wide range of specialised analytics services (often hosted on high-performance cloud platforms) by high-speed, low-latency networks (see Section 4 – Technology for Analytics-Driven Business in a Smart Connected World).

This report explores the financial services sector's analytics capabilities, and how players may use analytics to win in a competitive growth environment. This has been based on the extensive Telstra research in the Asia Pacific region, and contributions from industry leaders in different fields and industries.

Digital technology has irrevocably changed how customers expect to engage financial services. Institutions from the 20th century that choose not to adapt, but to rely on what worked in the past, can expect to be comprehensively out-competed.

2.0 MAJOR COMPETITIVE GROWTH FORCES

We begin the discussion by considering how analytics will impact four major competitive growth forces, and how these will redefine the environment in which tomorrow's financial service providers will compete and grow.

These forces are:

1. **The Age of Personalisation** – how the convergence of digital proliferation and changing demographics has fundamentally changed customer expectations from simple access to information to the intelligent application of that information;

2. **The Network Effect** – how new entrants in multi-sided markets can move and scale quickly, and how incumbents can either adapt leveraging the complexity of the market to protect themselves, or be exponentially out-competed;

3. **Cloud Business Models** – we propose shifting the conversation from thinking about cloud in a computing sense, to thinking about cloud as a business model; and

4. **Open Sourced Artificial Intelligence based Technologies** – we discuss how next generation cognitive systems are coming online faster and with much greater intensity. Such systems are positioned to help solve problems that have never been solved before.

We then bring these forces together into a Competitive Growth Model[3] that depicts their inter-relationships and provides the framework for how financial institutions should consider their strategic options.

Davenport and Harris (2007), in their research, defined analytics as 'the extensive use of data, statistical and quantitative analysis, explanatory and predictive models and fact-based management to drive decisions and actions. Analytics are a subset of what has come to be called business intelligence: a set of technologies and processes that incorporates the collection, management and use of data to understand and analyse business performance'[4]. Meanwhile, Siegel (2013), in his research on predictive analytics defines it as 'technology that learns from experience (data) to predict the future behaviour of individuals in order to drive better decisions'[5]. These definitions have been adopted in this report.

2.1 From the information age, to the personalisation age

'Information about transactions, at some point in time, will become more important than the transaction themselves.'

Walter Wriston,
former Chairman and CEO of Citigroup

Much of the innovation that occurred in the 20th century financial services industry was about providing access to money. For example, credit cards gave consumers a chance to pay without needing the cash on hand, while automatic tellers gave 24-hour access to cash. The most important attribute for institutions in this model was **trust**; primarily trust that the money placed with them would be returned when needed.

The early 21st century has been about access to information. Consumer marketing and services have collided with financial products through loyalty schemes, tailored interest rate offers and integration of financial management tools with regular banking products. Increasingly, information is gaining value in its own right. Whether it is simple information (in terms of rapid market data) or complex (such as advice from a professional based on detailed analysis of an individual's situation), consumers are increasingly willing to assign value to data and information in its own right.

This shift in behaviour runs in parallel with the assumption by consumers that institutions will treat their personal information with both care and respect – care in terms of protecting it from abuse, and respect in terms of not abusing the privileged access that the individual is allowing by agreeing to use the institution's banking, insurance or investment products.

Institutions that have a wider, more valuable relationship with the customer can leverage that relationship to discount the cost of collecting valuable data in the future – providing them with a significant competitive advantage.

The Future of Financial Advice reforms introduced in Australia in 2013 reflect, among other things, a move towards unbundling information and insight from products. Arguably, such a shift would have been unthinkable a generation ago, but has been made possible by the public's increasingly sophistication approach towards the value of information. If the rapid evolution of social media and the explosion of information shared through it is anything to go by, future generations may be even more relaxed about unbundling information.

The Internet reinforced reluctance on the part of consumers to pay for information that they are used to getting for free. Similarly, they have greater expectation of recompense (in some form or other) for the value of the information that they share with institutions. A good example of actually paying customers can be found in the collection of up-to-date contact information. An insurance company wanted to ensure the accuracy of customer details and ran an experiment. Three randomised groups of customers received forms in the mail to update their details together with a pre-paid envelope. The first group were simply asked 'please'. The second group were offered a nominal fridge magnet as a 'thank-you'. The third was offered a more substantial financial incentive.

The results were surprising. While the first group (with no returned value) had a poor response rate, the second and third groups had little to separate them in terms of return rates. The conclusion was that customers put a value on their **relationship** with the insurer, which provided a part-payment for the information, with only a small incremental payment required to realise that value. In light of that conclusion, institutions that have a wider, more valuable relationship with the customer can leverage that relationship to discount the cost of collecting valuable data in the future – providing them with a significant competitive advantage.

2.2 The Network Effect – Protection or Opportunity

'Peer-to-peer lenders like SocietyOne are very well placed to offer more creditworthy Australian borrowers a better deal and give more investors direct access to attractive new fixed income asset classes. This is why peer-to-peer lending works.'

Matt Symons, CEO SocietyOne

Financial services relationships range in nature from highly transactional through to highly consultative and collaborative, involving many participants (e.g. the consumer, merchants, traders, banks, schemes, their families, employers, financial advisers, brokers, regulators and third parties). The buyers pay in a variety of forms, including access to their money, future promises of interest and access to markets through their buying activities. Financial services products are, in fact, usually best described in terms of networks, with all of the actors connected together through ecosystems with complex business rules. Economists might describe this as a 'two-sided market' (see Figure 1).

Figure 1: Illustration of Two-Sided Markets

Source: Deloitte Research and Telstra Research, 2014

A two-sided market is a sophisticated relationship between buyers and sellers. The market's nature is to have a group of customers who have a many-to-many relationship with a group of providers (who may themselves also be customers). In the middle is the facilitating organisation, in this case a financial institution, thus creating a 'multi-sided platform'. Examples of two-sided markets, or organisations providing multi-sided platforms, are the major credit card companies, social networks or – more contemporarily – peer-to-peer lenders. In each case, these platforms provide a network benefit that amplifies as the number of participants increases, as demonstrated by the rapid growth of organisations such as Lending Club, Prosper in the rapidly growing peer-to-peer market, and PayPal in the payments market (see Charts 1 and 2).

As scale is such a significant advantage for multi-sided market platforms, consolidation tends to occur very quickly. For example, Alibaba (China's equivalent to Amazon), became a US$16 billion lender in less than three years and China's largest seller of money market funds in only seven months[6]. While there are periods of innovation when lots of new entrants join the market, the winners quickly emerge and are either acquired or begin to do the acquiring. This is a turbulent period for incumbents, as they need to make the right bets to ensure their scale advantage puts them in a position to be doing the acquiring rather than risk losing market share and potentially being acquired or eliminated. A recent example of this is Australia's Westpac Banking Corporations new venture capital fund taking an equity stake in Sydney based peer-to-peer lender SocietyOne.
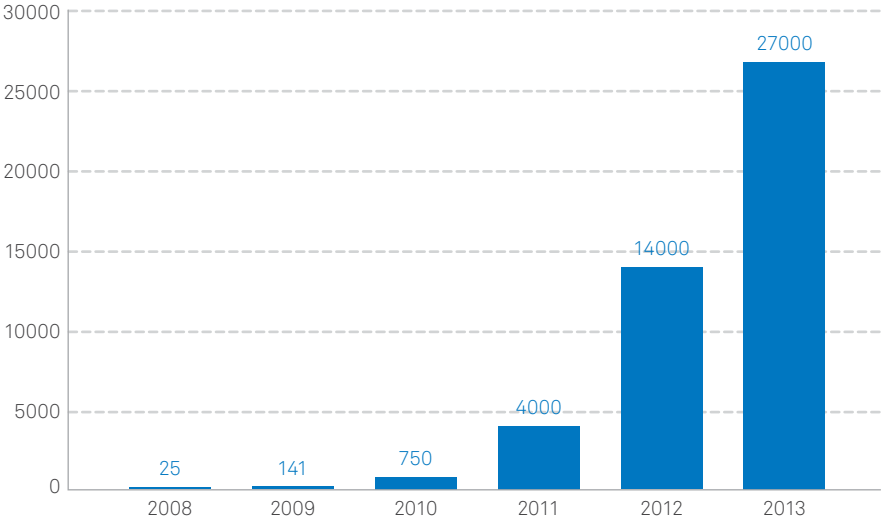
Whilst new entrants in multi-sided markets can move and scale quickly, incumbents can also adapt by leveraging the complexity of the market and their understanding of its nuances. However, a player that chooses not to adapt, relying on the complexity of the network to protect them, can be rapidly out-competed.

Chart 1: Combined Peer-to-Peer Issued Loans January 2014 by Lending Club and Prosper (Billions US Dollars)
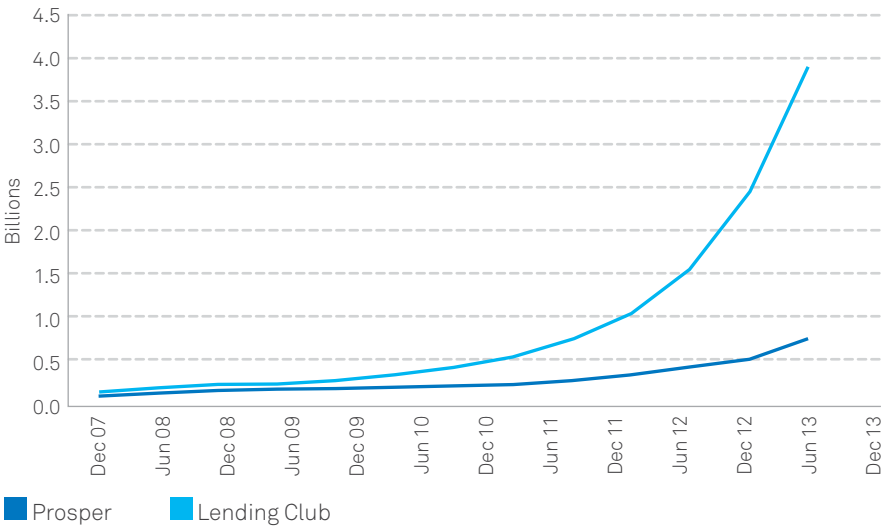
Source: Lending Memo

Chart 2: PayPal Annual Mobile Payments Volume 2008-13 (Millions US Dollars)

Source: Statista

Whilst new entrants in multi-sided markets can move and scale quickly, incumbents can have the advantage of understanding both the complexity and nuances of the market.

2.3 Cloud – it's not new technology, it's new business models

'Ultimately, the cloud is the latest example of Schumpeterian creative destruction: creating wealth for those who exploit it; and leading to the demise of those that don't.'

Joe Weinman, Senior Vice President at Telx and author of Cloudonomics: The Business Value of Cloud Computing

But what of the innovative ideas and products sitting on top of these multi-sided platforms? Many of these will be delivered in app-centric services that help simplify consumers' lives by synchronising data, simplifying contact, integrating online purchases, accessing and aggregating content. To say consumers have adopted this approach is a wild understatement. Consumers will typically quickly embrace a simple way to manage their banking or investment (particularly superannuation) products in a similar way.

The common attribute of these services is data. Almost every action taken by a consumer using cloud services generates masses of data that can be used to augment the existing customer data that financial institutions already hold – often substantially increasing its value.

Smart institutions will use this data and analytics on it to help consumers simplify their lives by anticipating their needs and creating value-added services that support the increasingly dynamic lifestyles we choose. The smartest institutions will take a leaf from the leading technology companies and encourage their customers to curate their own data to improve its accuracy, and the accuracy of the associated insights derived from it. The customer wins by receiving a more personalised service and the organisation wins by improving the quality of predictions applied to the broader market as well as the individual.

The competitive market for customers means that everyone is looking for an edge, something to bundle or a new way to add value. With cloud, the third party becomes a service that can participate in the client experience and derive value from it while leaving the client relationship intact. An example of this is the Commonwealth Bank of Australia's Property Guide – this augmented reality app is powered by realestate.com.au and rpdata.com and bundles property information into a value added application for consumers searching for real estate.

It is likely that we will see an increase in financial institutions partner with third parties such as retailers to provide an integrated online experience. Why would a customer want to go all the way through to an online store if all they want to do is repeat a purchase they made in a previous month? Their credit card statement on the Internet banking portal is the ideal place they could go to repeat the purchase. Done properly, this could be a true cloud service with a seamless set of rich shopping applications embedded.

> Everyone is looking for an edge. With cloud, a third party can participate in the client experience and derive value from it while leaving the original client relationship intact.

While change is a challenge to incumbents (who have scale), cloud computing provides an exciting opportunity to create an agile organisation with an extended ecosystem into other industries, and to launch products in response to new entrants almost as quickly as they appear. The ability to source data, analyse it and respond to the resulting insights will become a distinguishing characteristic of banks competing digitally. Importantly, cloud affords enterprises with the necessary agility to reduce the latency and associated risks associated with the lifecycle from the opportunity event through to taking action (see Figure 2).

Figure 2: The steps involved in taking action to respond to business events
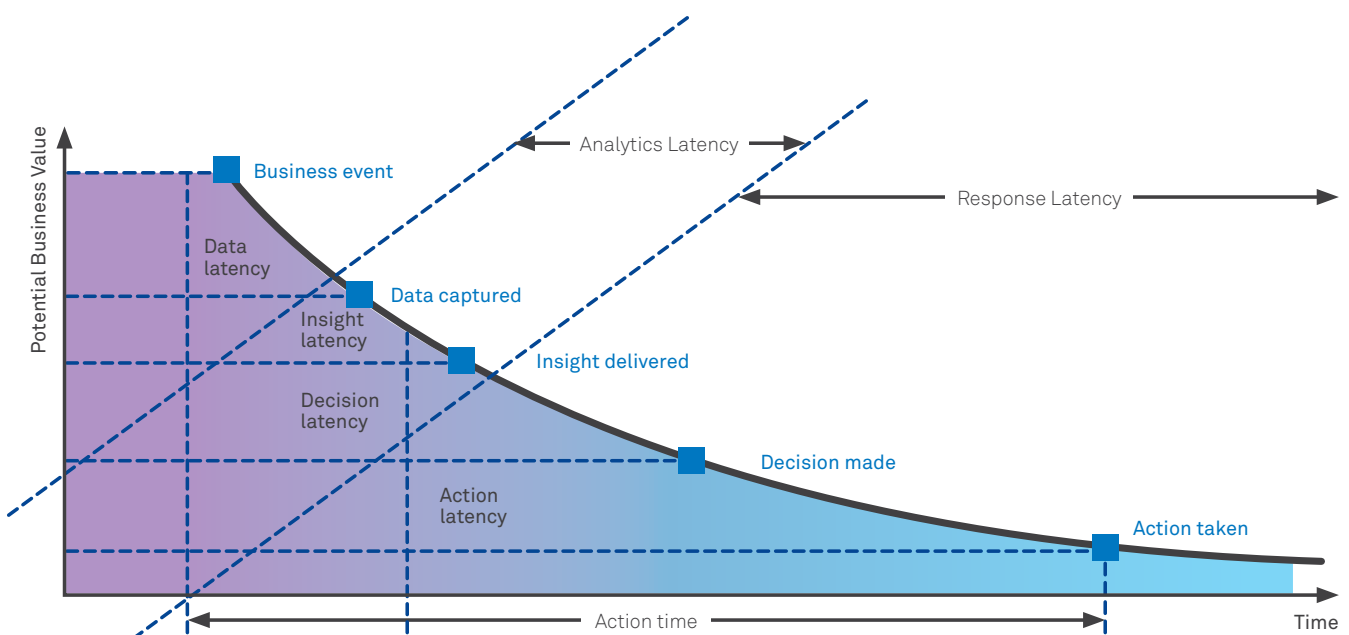
Source: TIBCO

2.4 Artificial Intelligence Cognitive technologies that educate themselves, support expression and deliver expertise, continue to evolve

'Analyse the past, consider the present and visualise the future.'

Thomas J. Watson, Senior –
IBM Chairman 1914-1956

When John Von Neumann started work in the 1940s on what has become the blueprint of all modern computers he imagined that computers could solve any problem. Von Neumann was a mathematician. He saw the world through a mathematician's eyes, believing anything could be modelled with mathematical precision using the language of mathematical symbolism.

Unsurprisingly, he built his computers based on mathematical ideals, programmatic logic, and defined rules. For over 60 years, this is what we have come to know of computing.

Unfortunately, what we have come to know of life is far less structured, organised, absolute, or even logical. Just take a look at how we communicate. Our language is full of innuendos, subtleties, idiosyncrasies, synonyms, metaphors and complex concepts for expressing abstract ideas. Why is it that noses run? Can houses really burn up as they burn down? Our communication with each other is ambiguous, illogical and very imprecise. And yet, it also turns out to be very effective. The paradox of the human condition is that it is our ability to reason, infer, and extrapolate from our interactions with others that makes us so efficient at affecting results with each other. Our minds are especially adept at producing and consuming information in this imprecise form.

As a consequence, our world is flooded with this messy, imprecise, and yet amazingly useful information – in the form of words, pictures, video, and audio recordings. In fact, 80% of all the digital information in the world is in the form of this unstructured information. Everything else is beyond the reach of traditional computing, leaving the vast richness of unstructured data to the limitations of what can be unlocked by the human mind. Given that 90% of the world's data was created in the past two years[7], this is an exceptionally tall task.

However, with the advent of Cognitive Systems, that is changing. When IBM's Watson bested the two grand champions (Ken Jennings and Brad Rutter) in the U.S. game show Jeopardy!, it represented a historic milestone and proof point that computers could go beyond what Von Neumann had envisioned. It was a system that read, understood, learned and, arguably, began to reason.

Consider a financial question that needs to be resolved and the complexity of that question. Consider this wealth management example:

Steve, a financial planner, conducted a quarterly financial review with a client today. He is 38-years old, married, father of two (12 and 14) and has a moderate-risk investment tolerance. His goals continue to be aligned with his children's education and retirement. He is currently heavily weighted towards small-cap growth funds, including a 24% stake in International Small-Cap mutuals. He also has a 14% portfolio stake in a property fund that specialises in retirement properties that is in its 3rd year, and is showing signs of being sold out to a well-funded investment group. This client captured losses last year that significantly reduced his income tax burden, but is not likely to repeat that against the broad market gains he's enjoyed this year with his current allocation. He's looking to explore shifting more of his holdings into tax-sheltered municipal bonds. However, he is suspicious of the stability of large municipalities, given the recently reported bankruptcy of a large city in that region.

Steve asks, what alternative bond funds would address my clients concern and align to his long-term goals?

Many of the more important questions we ask are really quite complex – involving contextual history, judgments, priorities, assumptions, observations, assessment, pre-conditions, and so forth, as a preface to the actual question we want to ask. And that preface can be full of jargon, technical elements, relative values, grammatical devices, and subtleties that are significant to the disciplines of the domain. But the use of the language can convey far more significant information that any enumerated list of structured data could ever offer – all of which is germane to answering the question.

And, of course, to find an answer to the question also requires the evaluation of complex ideas, knowledge, art and science captured in enormous reams of literature. The task of reading the thousands of reports, articles, papers, journals, studies, books, blogs, forums, and web pages that are produced every day (over 2.5 quintillion bytes or about 170 newspapers for every man, women, and child on the planet[8]) – even when narrowed to just those sources that are relevant to our discipline – is practically impossible.

This is the significance of a cognitive system: to be able to understand the language as well as we do ourselves, be able to read mountains of literature to find answers in seconds, and learn from the experience getting smarter with each action, outcome and new piece of information.

To understand this better it is worth delving deeper in to what defines a cognitive system. For example, IBM's Watson is a system that is able to learn its behaviour through **education**; that supports forms of **expression** that are more natural for human interaction; whose primary value is its **expertise**; and that continues to **evolve** as it experiences new information, new scenarios, and new responses; and does so at enormous scale. We refer to these as the 'four-Es' of cognitive systems.

> Access to information often leads to new insights for the user that enables them to discover risks and opportunities that might otherwise be elusive.

Today, Watson is able to command the language of the domain, from which it can answer questions, becoming the perfect assistant, coach, or concierge. That has the power of enabling users to find important information for their job – information that would otherwise be too hard to find in the river of literature flooding in to their work every day. More so, access to this information often leads to new insights for the user that enables them to discover risks and opportunities that might otherwise be elusive. Banks such as DBS Bank in Singapore, Citi in the USA, ANZ in Australia and Nedbank in South Africa have been early pioneers with Watson in financial services.

2.5 Competitive Growth Model – where to enter, adapt or be exponentially out-competed

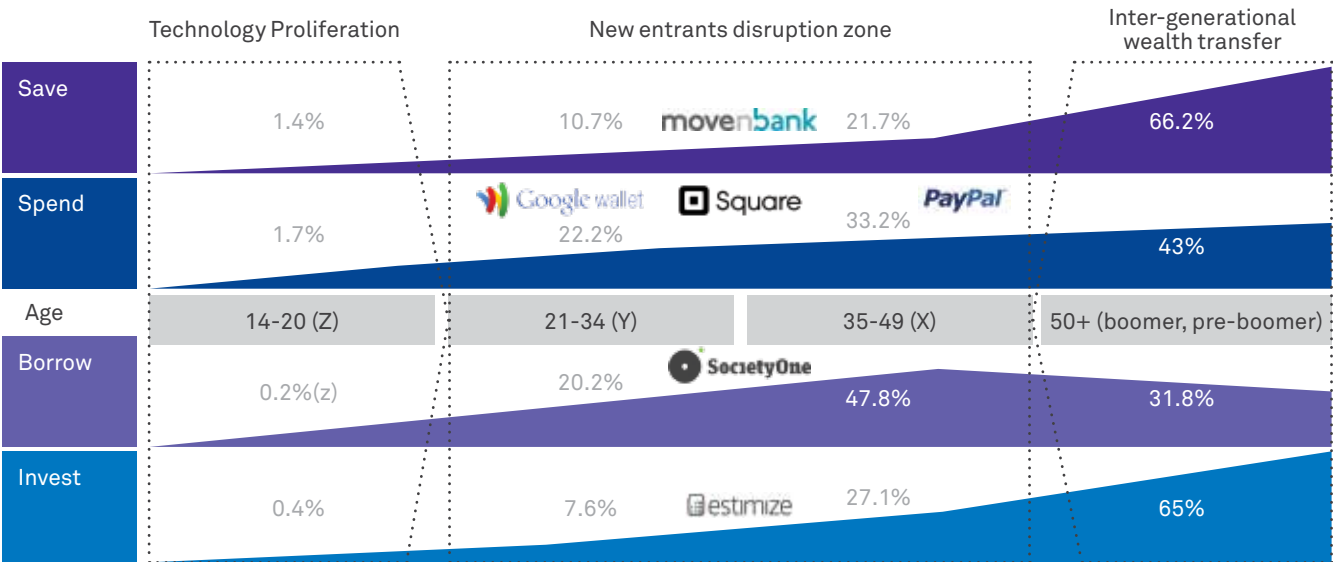'Frankly, I am more concerned about those two guys in a garage than the competitors I already know about.'

Jeff Bezos – Amazon.com founder

We now bring these four competitive forces together into a model to explain their inter-relationships while also taking into account the impact of technology proliferation and inter-generational wealth transfer on the financial services landscape.

The intensity of competition has increased significantly – a trend that will only accelerate as digital proliferation and inter-generational wealth transfer make traditional markets attractive for new entrants.

We are now seeing new entrants venturing into the financial services market with increasing regularity. Indeed, the competitive forces outlined almost **invite** entrants from non-traditional industries, who can leverage their cloud-enabled data holdings and the analytics capabilities they have developed (see Chart 3).

Chart 3: Competitive Growth Model

	Technology Proliferation	New entrants disruption zone	Inter-generational wealth transfer
Save	1.4%	10.7% movenbank 21.7%	66.2%
Spend	1.7%	Google wallet Square 22.2% 33.2% PayPal	43%
Age	14-20 (Z)	21-34 (Y)	35-49 (X) 50+ (boomer, pre-boomer)
Borrow	0.2%(z)	20.2% SocietyOne	47.8% 31.8%
Invest	0.4%	7.6% estimize 27.1%	65%

Definitions

Save Total Deposits
Spend Amount spent (last four weeks) on credit and debit cards (i.e. does not include cash or direct payments)
Borrow Total amount outstanding on all loans and amount intending to carry forward on credit card
Invest Total direct investments, managed investments, property investments (excluding primary residence) and superannuation

Source: Roy Morgan and Telstra Research, February 2014

Today's competitive forces almost **invite** entrants from non-traditional industries, who can leverage their cloud-enabled data holdings and their analytics capabilities, to enter the market.

The twin mega-trends of technology proliferation and inter-generational wealth transfer places a new epicentre of disruptive innovation squarely focused on Generations X and Y. This opportunity has attracted new entrants in the form of technology-based start-ups and 21st century information businesses pursuing adjacent strategies. This point was highlighted in a recent Finextra article (2014) titled *'Millennials look to tech firms to replace unloved banks'*[9] referring to a report on a three-year study of 10,000 people[10], some of the key findings of which were:

- 33% believe they won't need a bank at all in the future;
- Nearly 50% are looking to tech start-ups to overhaul banking; and,
- 73% would be more excited about a new offering from Google, Amazon, Apple, PayPal or Square than their bank.

In another development, it was reported by the European press that Facebook has sought approval from the Central Bank of Ireland to start a service that would allow users to store money on Facebook and use it to pay and exchange with others[11].

These attitudes are coming from generations that today include the greatest number of buyers of financial services. In the near future, inter-generational wealth transfer will also ensure these generations will hold the greatest pool of wealth in most countries. If their needs are unfulfilled, the research suggests they are quite willing to look beyond traditional providers. These non-traditional entrants, referred to by futurist Alvin Toffler as 'The Micro-Multinational', are often staffed by teams you can count on both hands and are unencumbered by legacy systems, legacy processes or legacy technologies. These players don't see themselves as banks, but rather data companies. One such example is Zopa, a peer-to-peer lender founded in 2005 whose CEO, Giles Andrews, tellingly said: 'The business is not a bank and I'm not a banker, we're more of a data company'[12].

These entrants share some common strategies:

1. **Deliver Personalisation** through creating digital propositions that are based on meeting the lifestyle needs of customers (as opposed to product orientations). Examples are Movenbank and Simple for digital mobile services;

2. **Design Network Platforms** to reach connected communities. These have demonstrated explosive growth, moving swiftly from start-up to mass-market relevance. Examples are PayPal in payments and Lending Club in peer-to-peer lending;

3. **Operate Cloud Business Models** by reducing barriers to scale with agile operations. Examples include Google Wallet for consumer and merchant payment services and Estimize – a service that facilitates aggregation of data from analysts for trading and investments; and

4. **Leverage Open Source Artificial Intelligence Based Technologies** in open collaboration that promotes universal access and redistribution.
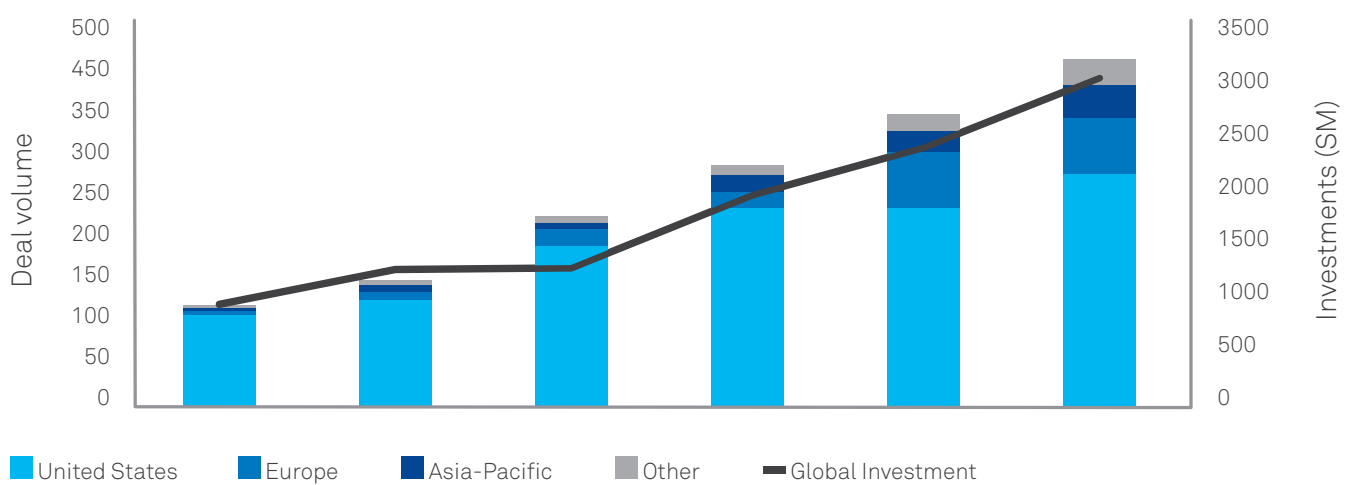
Some major financial services incumbents are already responding, including the Spanish bank BBVA, with their recent acquisition of Simple, and the direct investment by Australia's Westpac, via its new venture capital fund, into SocietyOne. Interestingly, Westpac's investment reflects a broader trend of global investment in FinTech ventures as captured by CB Insights, which tracks venture capital and emerging industries. Their data shows FinTech investment tripling from US$928 million in 2008 to US$2.97 billion in 2013, outgrowing overall venture capital spending by a factor of four[13] (see Chart 4). Key to note is that nearly a third of this funding in 2013 went into ventures focused on analytics and personal financial management (see Chart 5).

Governments, too, are noting the importance of these new entrants and new models. In a move to encourage greater access to credit, the UK's Chancellor of the Exchequer invited proposals to establish an independent referrals exchange process so that small businesses turned down for credit by a bank would be automatically referred to other credit providers, such as crowd-funding and peer-to-peer platforms[15]. In Australia, in its submission to the Financial System Inquiry, Federal Treasury has requested it consider the scope for promoting services by redesigning product disclosure requirements for the digital age; it suggested innovation to enable the growth of 'information intermediaries' that can apply expertise in presenting information in a more effective way.

Data analytics are at the heart of how these new entrants are establishing, competing and disrupting. We now consider how ready traditional players are for this new competitive environment, and discuss the transformation implications.
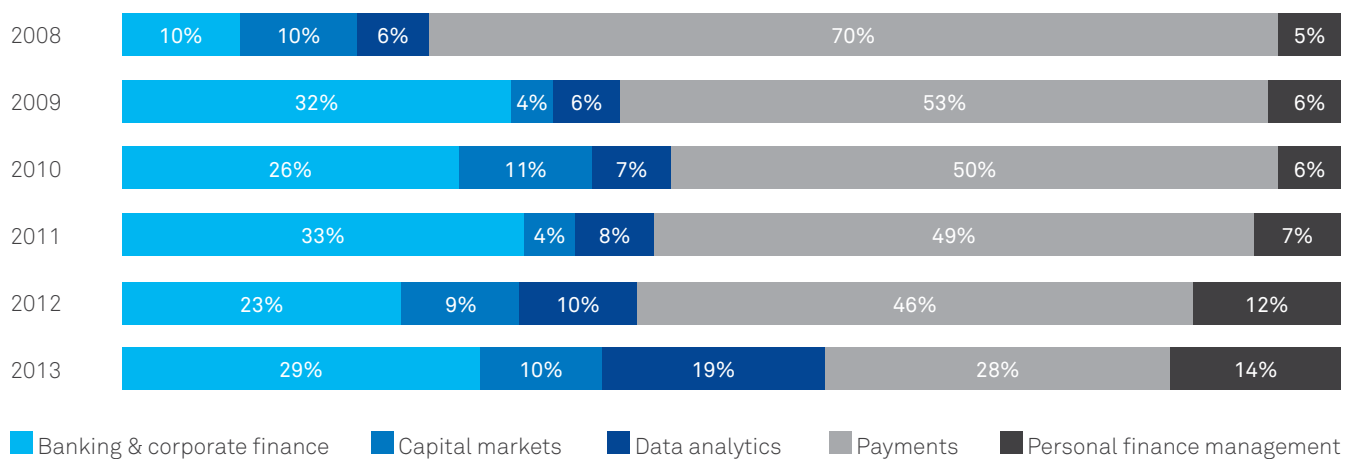
Nearly a third of FinTech funding in 2013 went into ventures focused on analytics and personal financial management.

Chart 4: FinTech Financing Activity (US$)

United States   Europe   Asia-Pacific   Other   Global Investment

Chart 5: FinTech Investment Areas

Year	Banking & corporate finance	Capital markets	Data analytics	Payments	Personal finance management
2008	10%	10%	6%	70%	5%
2009	32%	4%	6%	53%	6%
2010	26%	11%	7%	50%	6%
2011	33%	4%	8%	49%	7%
2012	23%	9%	10%	46%	12%
2013	29%	10%	19%	28%	14%

3.0 THE DATA ANALYTICS INDUSTRY AND CONSUMER RESEARCH

Having now considered some of the competitive and growth forces at play – and the importance of personalisation, the network effect, cloud business models and open source technologies – we now turn our attention to evaluating financial institutions, their customers and the opportunities for transformation.

Firstly, we gain an understanding of the strategic importance, competitive readiness and maturity of financial insitutions in the Asia Pacific region and how any transformation may affect them. Secondly, through new consumer research, we look to gain an understanding of what analytics-enabled experiences consumers value, and their associated business impact.

3.1 Methodology
This section has two parts. In 3.2, we summarise the key findings from a qualitative study conducted by Telstra up to May 2014 from interviews and surveys with 43 C-Level executives from banks, credit unions, insurance providers, payment schemes, trading exchanges and consumer and commercial finance providers across Australia, New Zealand and Asia. The objective of this research was to understand the competitive readiness of institutions, the maturity of their analytics capabilities, and their expectations in terms of their investments and the returns on this investment.

In Section 3.3, we present the key findings from a quantitative study, commissioned by Telstra, of consumers in five countries: Australia, Singapore, Malaysia, Indonesia and Hong Kong. The objective of this research was to understand attitudes towards current financial services providers in local markets and determine the current digital behaviour of consumers. Additionally, we wanted to gauge local perceptions of five analytics-enabled experiences and assess the potential impact of these on current behavioural patterns.

This study consisted of 3,106 surveys with a sample of consumers who have at least one of the following products for personal use: general transaction/savings account, home loan, credit card, high interest account, term deposit, personal loan or investment (e.g. unit trusts or managed funds). The online surveys were conducted from February to March 2014. The dataset in each country was weighted to be representative of the total population aged 20-69 years, according to region, age and gender.

3.2 Asia Pacific Financial Institution and Service Provider Competitive Readiness Study

'I wanted to build a company. I had no money, I had no business experience and I had no business idea. So I was perfectly qualified. I didn't want to build a bank. I wanted to build a technology company. Many days I went to work wondering if it would be my last day. There were many near-death experiences over the first five years. Our idea involved doing the business differently and that was hard to sell.'

Rich Fairbank, CapitalOne CEO

The objective of this study was to understand how institutions viewed current and future levels of readiness to compete analytically. Here we assessed their level of capability maturity, its strategic importance to their organisation, levels of investments, the benefit expectations, and importantly, which group within the organisation is now driving strategy, requirements and investments in analytics. The framework used in section 3.2.1 and 3.2.2 was developed and published by Davenport & Harris (2007) and applied to the sample.

3.2.1 Attributes of Analytical Competitors
Davenport & Harris (2007) define an analytical competitor as 'an organisation that uses analytics extensively and systematically to out-think and out-execute the competition'. Based on their study, they found that the most analytically sophisticated and successful organisations had four common characteristics:

1. Analytics supported a strategic, distinctive capability;

2. The approach to, and management of, analytics was enterprise-wide;

3. Senior management was committed to the use of analytics; and

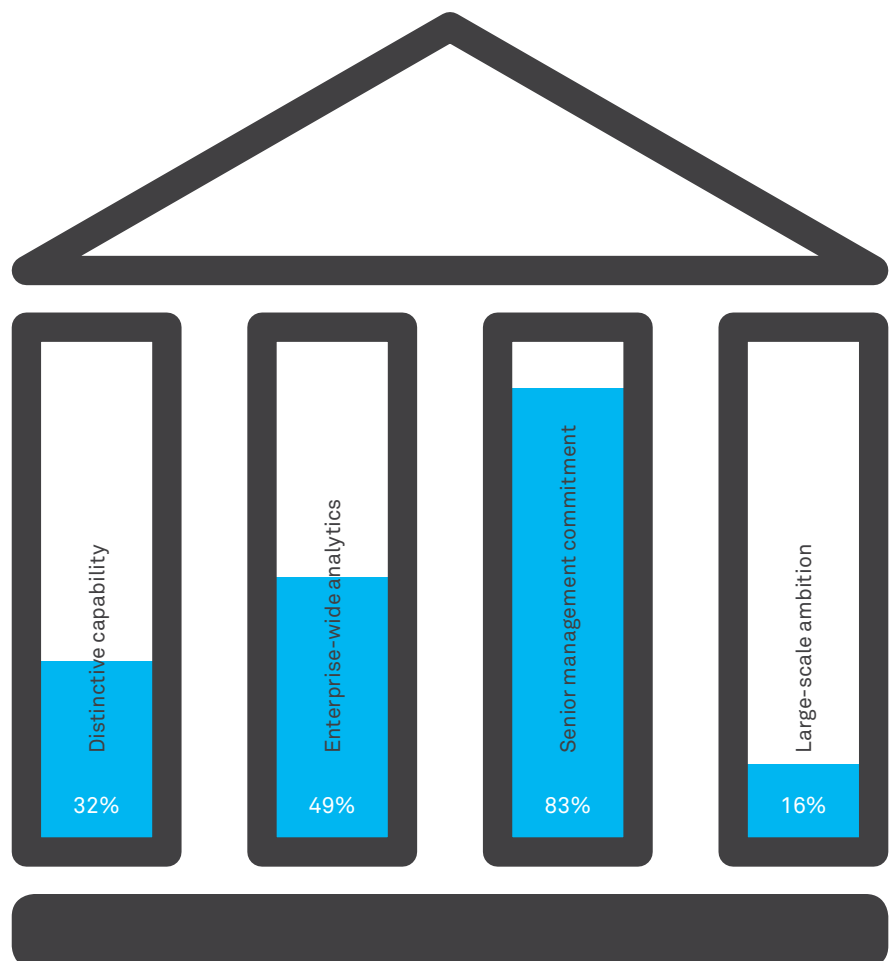4. The company made a significant strategic bet on analytics-based competition.

Importantly, they describe each of these characteristics as being broadly equivalent in terms of importance for defining an analytical competitor. The characteristics were not independent of each other, but should rather be viewed as four pillars supporting an organisation's analytical capability.

> Increasingly, analytics is being seen as an enterprise-wide issue, rather than being the sole province of one line of business.

Our study of financial institutions confirms these characteristics, but identified a 17% gap with only 83% reporting to have senior management commitment to data and analytics. This was reflected structurally too, with 49% of respondents reporting an enterprise-wide approach to analytics – thus indicating a shift from the capability being managed by a single or multiple line(s) of business to being organisation-wide through a centre of excellence (see Figure 3).

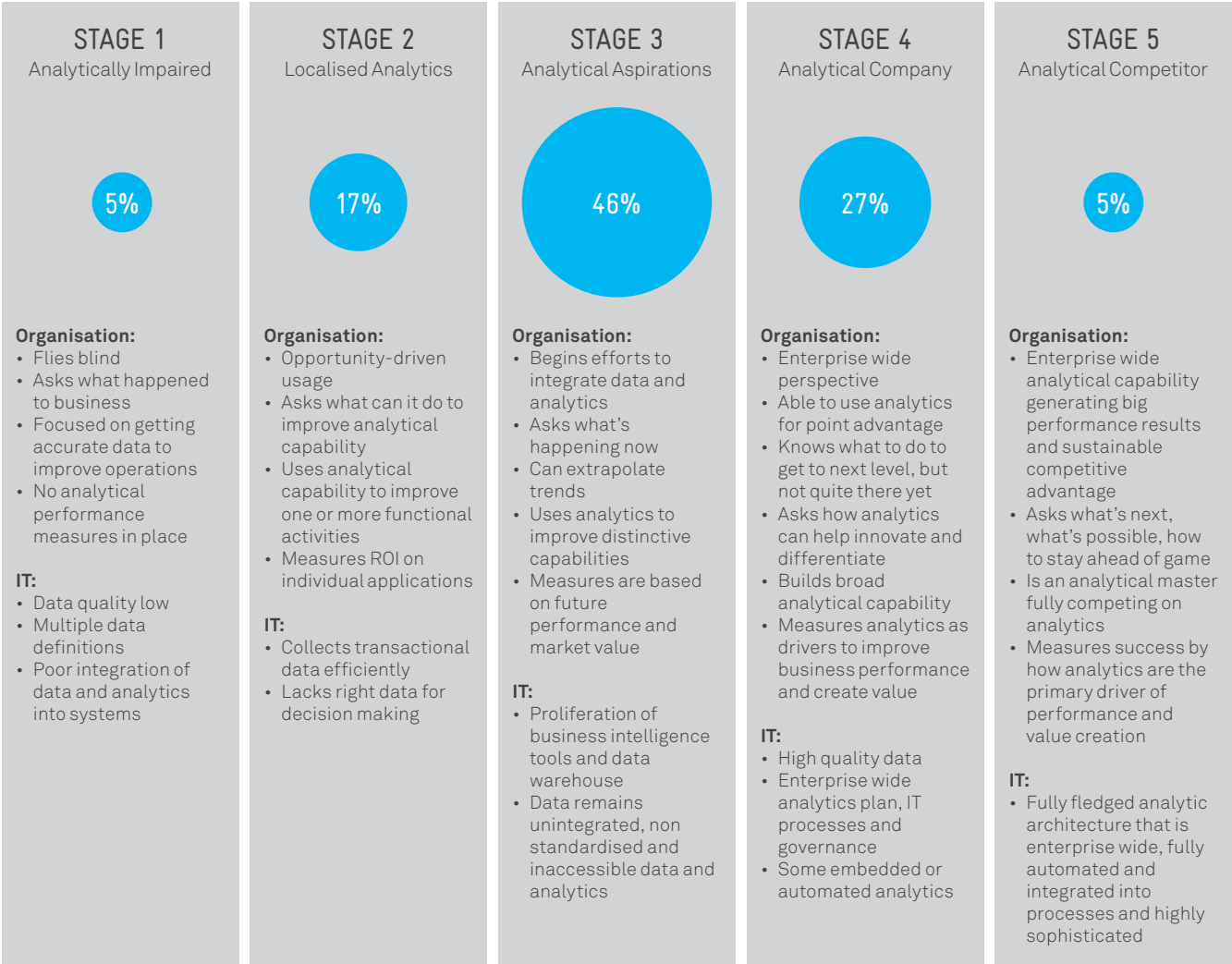**Figure 3: Four Pillars of Analytical Competition**

Distinctive capability — 32%
Enterprise-wide analytics — 49%
Senior management commitment — 83%
Large-scale ambition — 16%

Source: Reproduced with permission from Harvard Business School Publishing Corporation and Telstra Research, 2014

3.2.2 Assessing the Degree of Analytical Competitiveness
Davenport & Harris (2007) also detail a maturity model that outlines five stages on the path that an organisation follows – from having virtually no analytical capabilities (Stage 1) to being an analytical competitor (Stage 5). Figure 4 summarises these stages.

Figure 4: The Five Stages of Analytical Competition

STAGE 1 Analytically Impaired	STAGE 2 Localised Analytics	STAGE 3 Analytical Aspirations	STAGE 4 Analytical Company	STAGE 5 Analytical Competitor
5%	17%	46%	27%	5%
Organisation: • Flies blind • Asks what happened to business • Focused on getting accurate data to improve operations • No analytical performance measures in place **IT:** • Data quality low • Multiple data definitions • Poor integration of data and analytics into systems	**Organisation:** • Opportunity-driven usage • Asks what can it do to improve analytical capability • Uses analytical capability to improve one or more functional activities • Measures ROI on individual applications **IT:** • Collects transactional data efficiently • Lacks right data for decision making	**Organisation:** • Begins efforts to integrate data and analytics • Asks what's happening now • Can extrapolate trends • Uses analytics to improve distinctive capabilities • Measures are based on future performance and market value **IT:** • Proliferation of business intelligence tools and data warehouse • Data remains unintegrated, non standardised and inaccessible data and analytics	**Organisation:** • Enterprise wide perspective • Able to use analytics for point advantage • Knows what to do to get to next level, but not quite there yet • Asks how analytics can help innovate and differentiate • Builds broad analytical capability • Measures analytics as drivers to improve business performance and create value **IT:** • High quality data • Enterprise wide analytics plan, IT processes and governance • Some embedded or automated analytics	**Organisation:** • Enterprise wide analytical capability generating big performance results and sustainable competitive advantage • Asks what's next, what's possible, how to stay ahead of game • Is an analytical master fully competing on analytics • Measures success by how analytics are the primary driver of performance and value creation **IT:** • Fully fledged analytic architecture that is enterprise wide, fully automated and integrated into processes and highly sophisticated

Source: Reproduced with permission from Harvard Business School Publishing Corporation and Telstra Research 2014

The results of our study indicate that, to this point in time, 5% of financial institutions across Asia Pacific consider themselves to be analytical competitors (Stage 5). This result was consistent with the study by Davenport & Harris, who identified that analytical competitors in their US study were from information-intensive services firms – four of whom were financial services firms. Of interest in our study was that one of these organisations was an online-only institution born in the 21st century; another was a 20th century institution that had transformed.

The results indicate that approximately one in three (27%) are on the verge of competing analytically (Stage 4). We can expect that these organisations are likely to have already made the large investments in the requisite technology, people and processes and are now progressing to embedding the capability into strategy, products and systems. A survey by Gartner[16] found that the Big Data hype was translating into increased investments in, and adoption of, Big Data technology. The industries furthest along the adoption curve came from the banking sector, with 13% already deployed.

Nearly one in two (46%) respondents perceive themselves as having analytical aspirations, but still require major investments in capability (Stage 3). They are most likely to still be developing strategy rather than capability. They are also likely to be developing business cases to support capability investments across the organisation. This result is consistent with the broader findings of a study by SAP and Bloomberg of 100 banking executives in 2013. That study found that only 46% of banks can analyse external data about customers, only 32% could analyse social media activity, and only 29% could analyse share of wallet[17].

Approximately 17% of respondents perceive their capabilities as being more localised (Stage 2). They are more likely to be using analytics to support tactical activity, such as reporting, but do not use the capability to compete. Only a small proportion (5%) perceives their organisations as analytically impaired (Stage 1) (see Figure 4).

The overall results indicate a significant gap of 68% in the data and analytics and competitive organisational readiness, with only 32% perceiving that they are on the verge of (Stage 4), or ready (Stage 5) to compete using data and analytical capability.

> Nearly half the organisations surveyed have analytical aspirations, but still require major investments in capability. They are most likely to still be developing strategy rather than capability.

3.2.3 Level of Strategic Importance
Respondents were asked where data analytics ranked in their organisation's strategic priorities for FY14. The result of '4th' was an average across the sample, but it was reported that it has made a very rapid entry onto the corporate strategic agenda (see Figure 5). In a global retail banking study by PwC, 90% of executives agreed that ensuring they can harness the power of Big Data is one of the six key priorities for leading banks today. Of interest in that same study was that only 20% feel well prepared or are investing to address those priorities[18].

Figure 5: Ranking in Top 10 Strategic Priorities

4th
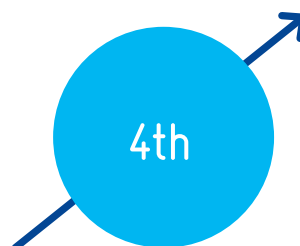
Source: Telstra Research, 2014

3.2.4 Expectation on Improving Results
Respondents were asked to what percentage performance improvements they were expecting from the introduction of analytics capabilities. The result of 6.3% was an average across the sample, and reflects how the majority of institutions reported being Stages 3, 4, and 5 in their degree of competitiveness, with a clear understanding of benefits (see Figure 6).

Figure 6: Results Performance Improvement Expectations (%)

6.3%
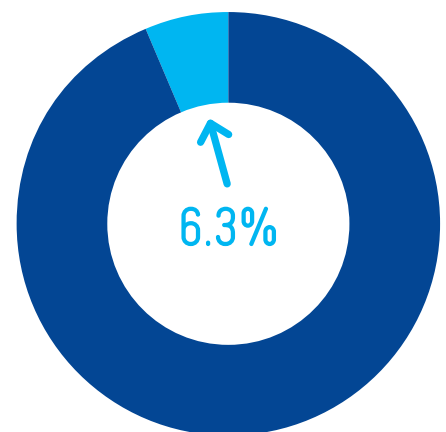
Source: Telstra Research, 2014

> Companies that invest in Big Data analytics outperformed their peers by 5% in productivity and 6% in profitability.

3.2.5 Level of Investment

Respondents were asked what percentage of their organisation's budgets was allocated toward analytics projects. The result of 6% again reflects the level of strategic importance and benefit realisation that this area now occupies in the organisational program (see Figure 7). This result is consistent with Ovum's findings that investment by retail banks is expected to accelerate between 2014-2018, with the growth rate ranging between 5.3% and 6.4%[19]. Gartner further reported that 34% of bankers and 26% of insurers have already invested in Big Data, with 24% of bankers and 40% of insurers planning to invest within the next two years. Gartner also noted that 44.7% of organisations across many industries in the Asia Pacific region have ambitious plans to invest over the coming two years[20]. In another study by McKinsey and Massachusetts Institute of Technology, it was reported that companies that invest in Big Data analytics outperformed their peers by 5% in productivity and 6% in profitability[21].

Figure 7: Data Analytics FY14 Budget Proportion (%)

6%
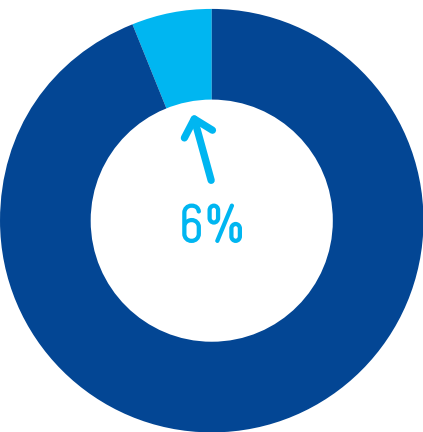
Source: Telstra Research, 2014

3.2.6 Departmental Stakeholders

Respondents were asked to select which departments were stakeholders in analytics capabilities. What we found was that 66%-85% of respondents are using analytics for sales, marketing and service-related activity with marketing (at 39% of respondents) now emerging as the clear leader in driving strategy, requirements and investments in this area (see Charts 4 and 5).

Chart 6: Departments Using Data Analytics (%)

Department	%
Human Resources	32%
Logistics	27%
Operations	85%
Marketing	83%
Sales	78%
Customer Service	66%
Executive Management	78%
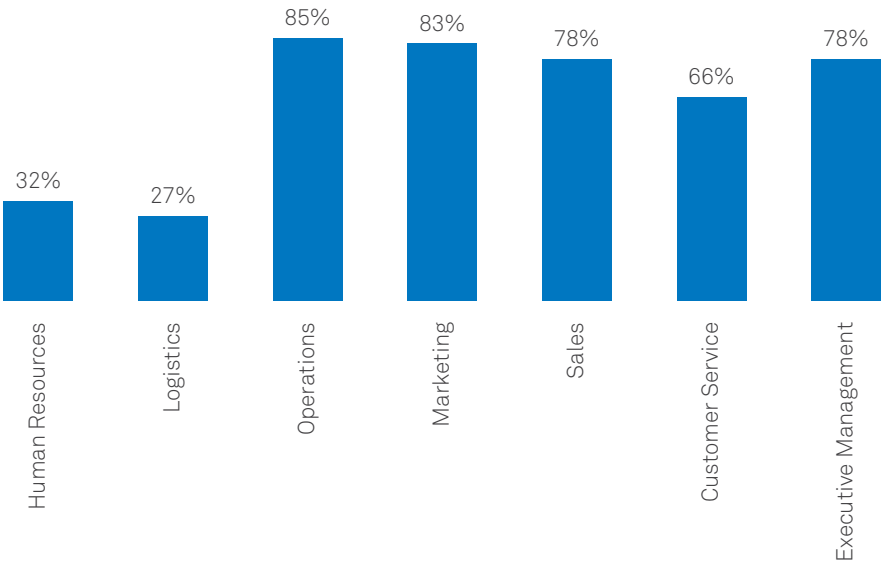
Source: Telstra Research, 2014

Chart 7: Department Leading Data Analytics Strategy, Requirements, Investment (%)

YES

- Operations
- Marketing
- Sales
- Executive Management
- Other

10%
39%
19%
24%
8%
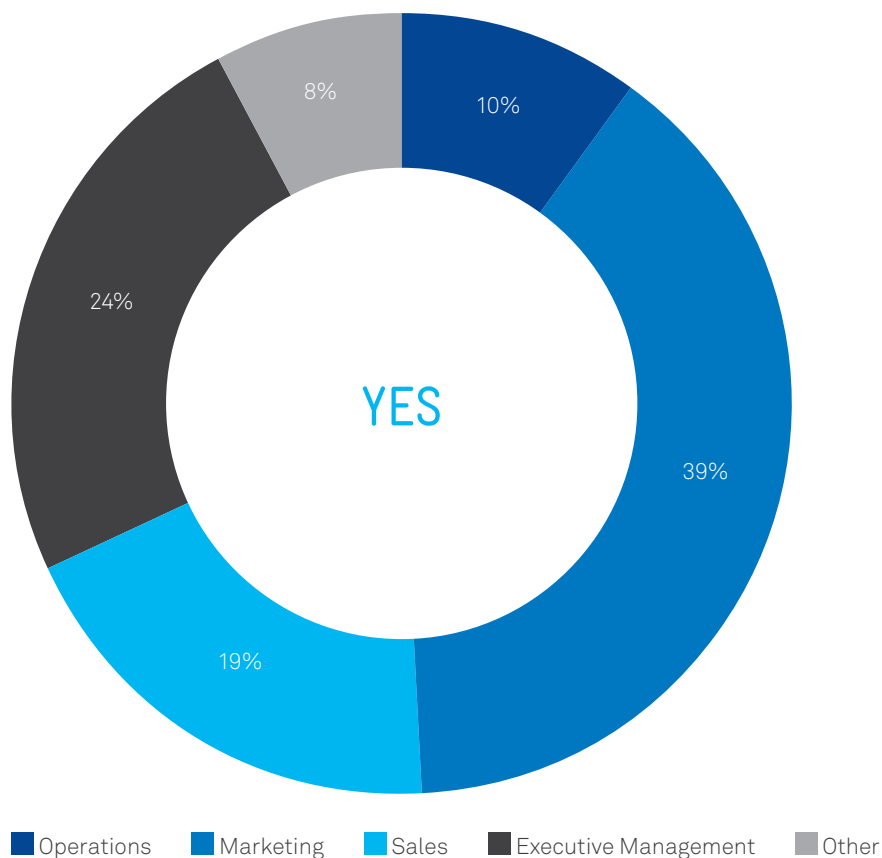
The overall results indicate a significant gap of 68% in the readiness of institutions to compete on data analytics, with only 32% perceiving that they are on the verge of competing, or ready to compete, using data analytical capability. Further, there was a 17% strategic priority gap identified with only 83% reporting to have senior management commitment to data analytics. These gaps explain the significant investments (averaging 6% of organisational budget in FY14) being allocated for data analytics projects. Corresponding expectations for performance improvements averaged approximately 6.3%. Clearly, growth is the major driver of investment, with 68% of Sales and Marketing departments now driving the data analytics strategy, requirements and investment programs.

Source: Telstra Research, 2014

3.3 Analytics-Enabled Consumer Experience Study

Respondents across Australia, Singapore, Malaysia, Indonesia and Hong Kong were asked to evaluate a series of analytics-enabled service concepts. The concepts were shown to respondents in a random sequential order in order to ensure a reliable analysis of all concepts. Descriptions of each concept are provided in 3.3.1.

For each concept, respondents were asked to indicate the level of appeal of that concept, as well as the likelihood of using this service if it were offered by their main financial service provider.

Those who indicated they found the concept appealing and were likely to use it, were also asked to indicate how the concept would impact on their satisfaction levels, likelihood to recommend their provider to friends and family, the impact on consideration when switching financial services provider and the impact on consideration when opening new accounts with their current financial services provider.

As well as these metrics, respondents were also asked about the likely impact of each concept on their perceived banking experience. Nine items were tested as baseline (i.e. 'pre') measures prior to the concept evaluation; for example, one of the tested items was: 'Knows me and my financial situation, irrespective of how I use the bank or financial institution (e.g. in person, in a branch, contact centre or online)'. The full list of items is shown in Table 1. Respondents were asked to indicate how well their main financial institution performed on each item.

During the evaluation of each concept, respondents who had indicated they were likely to use that concept were then asked to rate how well or poorly each concept would deliver on these same experience measures if provided by a financial institution (i.e. a 'post' measure). Not all metrics were rated for each concept, only those experiences that were appropriate for that concept.

For the analysis of this data, the difference between the pre measure and the post measure was calculated to create an impact score. The impact scores were then averaged out across the five countries to provide a single experience impact score for each of the nine attributes. In this report, we highlight which two experiences are most impacted (across all countries) for each concept.

3.3.1 Concept Descriptions and Perceived Banking Experience

A	Personalised In-Branch Experience

An in-branch experience that is personalised and customised to your needs.

This is a service you would opt-in to use which would allow bank branch staff to receive a notification as soon as you arrive at a branch. This notification would contain information about your recent interactions with the bank and your financial history, allowing the branch staff to offer a more customised and personalised experience in your visit to the branch without you having to explain it.

B	Personalised Contact Centre/ Telephone Experience

A contact centre/telephone experience that is personalised and customised to your needs.

This is a service you would opt-in to use which would allow your call to a bank call centre to be personalised and customised based on the financial products you hold, or have enquired about with that bank. For example, the menu options you hear once you have identified yourself when waiting on the phone would be customised so that you only hear options that are relevant to you.

C   Personalised Digital Banking Experience

Personalised digital banking experiences.

This service would allow you to access digital tools and insights to help manage your finances such as saving, spending, borrowing or investing. These tools and insights could include things like calculators, tracking of your spending and savings in real time with relevant ads, alerts, recommendations and notifications sent to you based on your financial behaviour. This service would be accessed online on any device (e.g. a smartphone, tablet or computer).

D   Digital Advice

Integrating banking, financial and insurance services advice.

This service would allow you to access specialist advice on banking, financial and insurance services. This service would offer advice in a number of different ways: virtual/digital advice (e.g. advice accessed using speech/voice recognition technology or online), access to a specialist/expert in person, via video chat or over the phone and advice via social networking with customers who have similar banking and financial services needs to you.

E   Insurance Customised to Behaviour and Lifestyle

Insurance customised to your behaviour and lifestyle.

Insurance where your premium is calculated according to your specific usage patterns. Because you are only paying for what you use, the key benefit of this concept is that it will result in a fairer premium.

EXAMPLES

- Comprehensive motor insurance where your premium is calculated based on how often you use your car, how far you drive, and where you drive or park your car. This information is accurately captured by a GPS type device installed in your car and transmitted back to your insurer.

- Private health insurance where your premium is calculated according to your specific lifestyle, such as how often you exercise and receive medical check-ups. This information may be captured via an application (app) you install on your smartphone or another device.

- Home and contents insurance where your premium is calculated according to the monitoring devices installed on windows and doors throughout your home. This information is accurately captured by a monitoring device installed in your home and transmitted back to your insurer.

- Life insurance where your premium is calculated and adjusted according to your lifestyle - for example whether or not you use public transport, exercise regularly and receive medical check-ups. This information may be captured via an application (app) you install on your smartphone or another device.

3.0 THE DATA ANALYTICS INDUSTRY AND CONSUMER RESEARCH (CONT.)

Table 1: Perceptions of Banking Experiences

1. Provides easy-to-understand, digital explanations of products
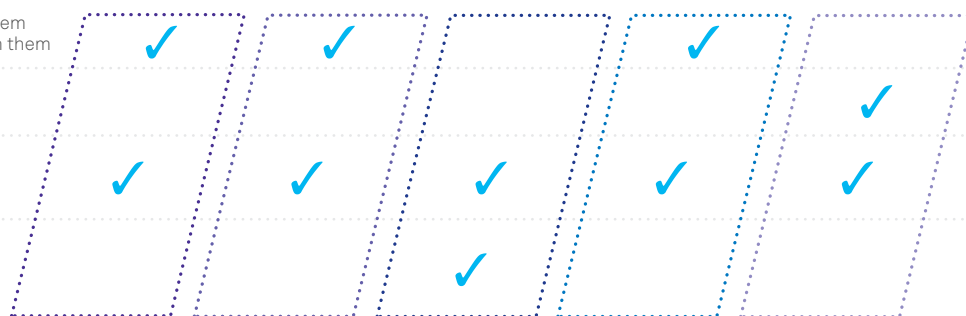
2. Access to banking experts when I need them, through my preferred way of interacting with them

3. Proactively recommends products and services that are relevant to me with enough information on the product for me to make decisions

4. Provides information on products in an engaging way

5. Provides information in a way that is easy for me to access

6. Provides information that helps me achieve my goals, such as saving, spending, borrowing or investing

7. Knows me and my financial situation, irrespective of how I use the bank or financial institution (e.g. in person in a branch, via a contact centre or online)

8. Provides me with tools and insights to help me manage and control my finances, specifically saving, spending, borrowing and investing

9. Alerts me when something relating to my finance occurs that I need to know about

The following section outlines the research findings of the concept evaluation. Please note that throughout the analysis, the scores in Asian countries are consistently higher than those in the Australian market. While this is the case, it does not necessarily mean that all of these concepts will perform better in these Asian online markets than in the Australian market, as there could be several reasons for this, two of which include:

1. Cultural factors can encourage some respondents to indicate more positively when evaluating potential market concepts; and

2. The Internet may be less integrated into the general population in some Asian markets. As a result, the online population in these countries may represent a more 'early adopter' orientation than in more mature markets such as Australia, where the online population is now considered to be broadly representative of the total population. This will result in Asian consumers being more open to trying new market concepts.

As such, specific results should always be viewed in the context of all concepts within each country (i.e. what is the highest ranked concept as opposed to the lowest ranked concept in Australia?) rather than across countries.

3.3.2 Appeal and Impact of Concepts

Each of the five digital service concepts achieved high appeal levels in all countries.

Chart 8 shows the appeal ratings for each concept by the individual countries, as well as the experiences most affected for each concept, across all countries.

Chart 8: Appeal and Experience Perception Impact by Country

Perceptions Changed | **Impact on Experiences with Financial Institutions**

Access to banking experts when I need them through my preferred way to interact with them

Proactively recommends products and services that are relevant to me

Knows me and my financial situation, irrespective of how I use the bank or financial institution

Provides me with tools and insights to help me manage and control my finances, specifically saving, spending, borrowing and investing

Appeal Score Card
(%) (total population)

		A. Personalised In-Branch Experience	B. Personalised Contact Centre/ Telephone Experience	C. Personalised Digital Banking Experience	D. Digital Advice	E. Insurance Customised to Behaviour and Lifestyle
Australia		41	43	38	28	50
Singapore		57	56	62	45	61
Hong Kong		57	60	58	51	50
Malaysia		64	60	70	57	61
Indonesia		82	78	86	78	78

✔ Indicates top two experiences per concept   ▮ Indicates two highest concepts per country

Source: Telstra Research, 2014

27

Australians found the customised insurance (50%) and personalised contact centre (43%) concepts most appealing. Singaporeans found the personalised digital banking experience and customised insurance concepts most appealing, with around six in ten indicating that they found each appealing (62% and 61% respectively).

Amongst Hong Kong consumers, the personalised contact centre (60%) and personalised digital banking (58%) concepts were considered the most appealing.

In the Malaysian market, the highest level of appeal was achieved by the personalised digital banking experience (70%) and the personalised in-branch experience (64%). Indonesians were generally positive, with 86% indicating that the personalised digital experience was appealing, and 82% finding the personalised in-branch experience appealing.

These results show quite clearly the value of a personalised digital banking experience for the various markets across the Asia-Pacific region, with this concept ranked in the top two most appealing in all Asian markets.

Alternatively, those who did find the digital advice concept appealing in any country showed strong support for the concept in terms of satisfaction and advocacy scores. This would suggest that it could develop a strong niche position with the Asia Pacific region and provide a useful customer acquisition tool.

> The personalised digital banking experience was highly valued across all markets in the Asia-Pacific region. The digital advice experience could also help with customer acquisition and retention. Interestingly, in all countries the personalised in-branch experience concept appears in the top three concepts.

All nine experience metrics achieved positive results (for every concept for which they were measured – note, some experience metrics were not relevant to the concept and therefore were not measured).

This indicates that each concept has the potential to improve consumer perceptions of financial institutions.

With that in mind, the 'Knows me and my financial situation, irrespective of how I use the bank or financial institution' experience achieved strong positive results across all five concepts (in the top two for all concepts). The ability to access banking experts when needed was also a common benefit across personalised in-branch experience, personalised contact centres and digital advice. Finally, the provision of tools and insights that inspire and help consumers to manage their finances was a strong theme across the personalised in-branch experience and personalised contact centre experiences.

3.3.3 Incremental Appeal
Analysis was conducted to identify the optimal number (and combination) of concepts. This analysis looks to identify the combination of concepts that obtain the greatest number of people who find at least one of the concepts appealing. Chart 9 shows the incremental appeal levels for each market as concepts are added to the concept portfolio.

Chart 9: Incremental Appeal of Concepts (based on five concepts)

IMPORTANT NOTE:
These levels of appeal are based on specific concept combinations as shown in Table 2.

Legend: Australia, Singapore, Hong Kong, Malaysia, Indonesia
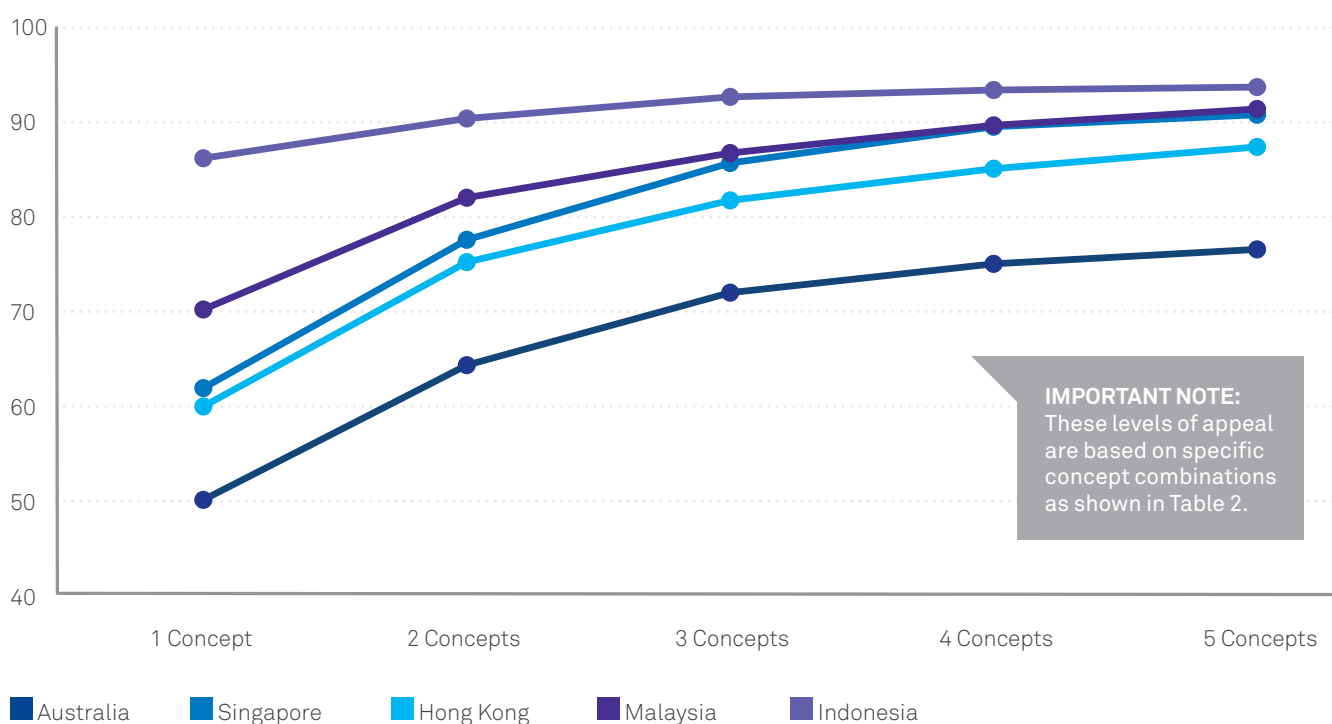
Source: Telstra Research, 2014

Appeal generally begins to plateau at three concepts in Australia, Singapore, Hong Kong, Malaysia and Indonesia. In Indonesia, marginal appeal is relatively limited as new concepts are added to the portfolio. This is a result of the overwhelming appeal levels of all concepts (NB. this may be a result of the low penetration of digital financial solutions in the market as whole, which would mean that these concepts are relatively foreign to the Indonesian online market and therefore potentially represent a new and somewhat exciting prospect for financial services in the country).

To achieve the maximum appeal in each country, a specific combination of concept should be utilised. Table 2 shows the ideal combination of services in each market.

Table 2: Concept Combinations (based on five concepts)

	Australia	Incremental Appeal	Singapore	Incremental Appeal	Hong Kong	Incremental Appeal	Malaysia	Incremental Appeal	Indonesia	Incremental Appeal
1 Concept	E	50	C	62	B	60	C	70	C	86
2 Concepts	E B	64	E A	77	C B	75	E C	82	C B	90
3 Concepts	E B A	72	E C A	85	C B A	81	E C A	86	D B A	92
4 Concepts	E C B A	75	E C B A	89	D C B A	85	E C B A	89	D C B A	93
5 Concepts	E D C B A	76	E D C B A	90	E D C B A	87	E D C B A	91	E D C B A	93

A. Personalised In-Branch Experience	B. Personalised Contact Centre/ Telephone Experience	C. Personalised Digital Banking Experience	D. Digital Advice	E. Insurance Customised to Behaviour and Lifestyle

Source: Telstra Research, 2014

Personalised digital banking and customised insurance appear in the top two concepts for each country (with the exception of Indonesia). Interestingly, in all countries the personalised in-branch experience concept appears in the top three concepts. This finding may contradict the suggestion by some commentators that the in-branch experience is dying and will eventually be replaced by the online mode. Instead, it suggests that the in-branch experience is still a fundamental part of what makes a financial services provider appealing to consumers in the Asia-Pacific region.

3.3.4 Impact of Concepts on Retention
Chart 10 shows the impact of each concept on retention amongst those who indicated they would use the concept.

Chart 10: Impact of Concepts on Retention by Country

Retention Score Card (%)
Average of impact on satisfaction and impact on recommendation scores amongst those who find concept appealing and are likely to use

	A. Personalised In-Branch Experience	B. Personalised Contact Centre/ Telephone Experience	C. Personalised Digital Banking Experience	D. Digital Advice	E. Insurance Customised to Behaviour and Lifestyle
Australia	82	80	82	86	78
Singapore	92	88	62	90	89
Hong Kong	90	88	85	87	87
Malaysia	94	91	95	91	93
Indonesia	97	97	97	96	96

Indicates two highest concepts per country

Source: Telstra Research, 2014

In Australia, the digital advice concept has the greatest impact on customer retention amongst those who would use the concept (86%). Within the Singaporean market, those who would use the personalised in-branch experience give it a retention value of 92%. In Hong Kong, the personalised in-branch experience drives customer retention with a factor score of 90% amongst those who would use the service. Malaysian consumers who would use the personalised digital banking service gave it a 95% retention score, while the digital advice and personalised contact centre offerings were both scored at 91%. Finally, Indonesia was split with the personalised in-branch, contact centre and digital banking concepts all achieving the strongest retention scores (97%) amongst those who would use them.

These results show the ongoing importance of a good in-branch experience. While digital services have proven to be an appealing and useful supplement for financial services, the strong retention scores achieved by the personalised in-branch concept indicates that there is no surrogate for high quality in-branch service.

3.3.5 Impact of Concepts on Acquisition

As well as measuring the impact on customer retention, the research also measured the impact on customer acquisition for each concept. Once again, the questions were asked of those that indicated they would use a concept. Chart 11 shows the results for each concept by country.

Chart 11: Impact of Concepts on Acquisition by Country

Acquisition Score Card (%)

Average of impact on consideration when opening a new account and impact on consideration when switching amongst those who find concept appealing and are likely to use

		A. Personalised In-Branch Experience	B. Personalised Contact Centre/ Telephone Experience	C. Personalised Digital Banking Experience	D. Digital Advice	E. Insurance Customised to Behaviour and Lifestyle
Australia		72	67	78	80	75
Singapore		83	79	81	88	87
Hong Kong		83	78	80	86	85
Malaysia		92	86	88	88	93
Indonesia		94	93	94	96	93

Indicates two highest concepts per country

Source: Telstra Research, 2014

Amongst those Australians who would use each concept, customer acquisition was highest for the digital advice concept (80%). Singaporeans who would use digital advice indicated an acquisition score of 88%. The Hong Kong market showed similar results to Australia and Singapore, with the digital advice concept achieving an acquisition score of 86%. In Malaysia, those who would use customised insurance gave it a 93% acquisition factor, while Indonesians who were inclined to use the digital advice concept gave it a 96% acquisition score.

Across all countries, the personalised contact centre service does not appear to be as effective as other concepts at generating customer acquisition, receiving the lowest acquisition score of all concepts in each country. Given that this service also did not perform as strongly as other concepts in the retention analysis in several countries, the results would suggest that a customised call centre concept should be adopted in certain countries only if it achieves better outcomes for the financial service operator in terms of reduced costs or some other strategic benefit.

These results indicate that, in general, analytics-enabled digital financial services may provide consumers across the Asia Pacific region with a deeper feeling of connection with their bank or financial services provider. By integrating these services, banks and other financial service providers can provide a more customised service to the modern consumer that can help promote customer acquisition, engagement and retention. However, as these digital services can only be enabled by large-scale analytics, it is now becoming clear that modern financial services providers need to have well-developed analytical information gathering capabilities.

4.0 TECHNOLOGY FOR THE ANALYTICS-DRIVEN BUSINESS IN A SMART CONNECTED WORLD

The research now leads us to consider the technology environment from both a consumer and financial institution perspective.

Here, we present our vision for a Smart Connected Financial Services World. We then provide guidance on how analytics and communications technologies can be used to respond to the changing competitive environment, and how the design of experiences that are valued by consumers can deliver growth.

4.1 The Consumer Environment - A Smart Connected World

'Smart networks, smartphones and smart software are putting technology right at the heart of the Australian economy and connection at the heart of the Australian way of life. Technology is connecting everyone and everything - and creating new opportunities for all of us'.

David Thodey, CEO Telstra Corporation Limited[22]

The Smart Connected World has many pseudonyms: the Internet of Things, the Internet of Everything, and the Industrial Internet. However, in each version this vision is essentially underpinned by five basic premises:

- **Everyone is connected**
  We are near the end of one phase of the connectivity revolution where the focus has largely been on connecting people to the Internet, typically via 'traditional' devices such as PCs, smartphones and tablets. In developed economies, we are rapidly reaching a point where, for most purposes, we can assume all those wishing access to the Internet can have it. The ITU estimates 77% of people in the developed world use the Internet today[23]. At current growth rates, this will reach 95% in 2020. Of course, one of the headline stories of personal connectivity

Figure 8. Growth in connected devices

30-75 Billion devices

10-12 Billion devices

2013   2020
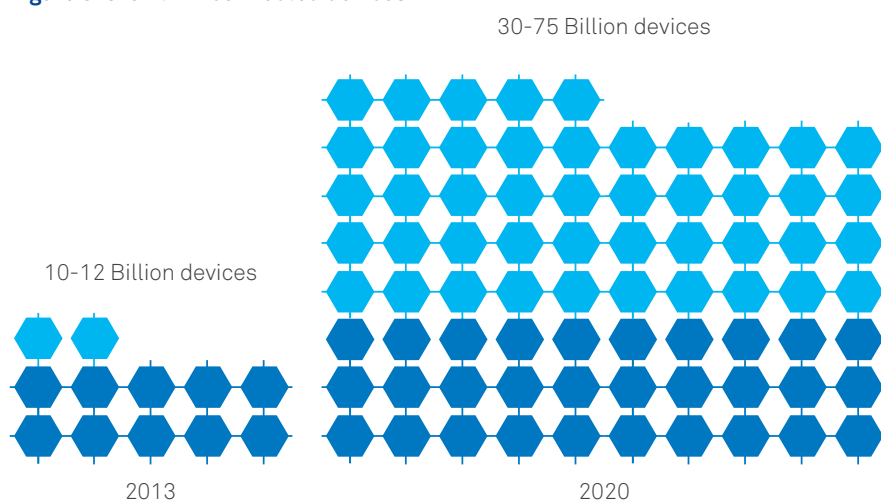
has been the ability for people to connect with each other more readily, with almost two billion active social platform users globally and more than 6.5 billion mobile phones in a world of about 7.2 billion people[24].

- **Everything is connected**
  The next phase of the age of connectivity focuses on connecting devices and exposing data from those devices, primarily for consumption by other devices (i.e. not humans). Underpinning this machine-to-machine connectivity is a range of high-bandwidth, low-latency, short-range communications technologies, such as Fibre, Bluetooth 4.1, IEEE 802.15.4 and WiGig. Various sources predict the global ecosystem of connected devices will increase to 30-75 billion devices by 2020[25] - that's between 4-10 connected devices for every person on the planet. In fact, Cisco estimate almost 3% of all 'things' on earth will be network-connected by 2020 – up from 0.6% in 2012[26]. Of course, the trend to pervasive high-speed connectivity isn't restricted to people and individual devices – it applies equally to more complex abstract entities such as markets. The high-frequency trading (HFT) market has now become globalised. The Bank of England estimated that

in 2010, HFT accounts for 40% of equity order volumes in Europe, over half of volumes in the US and for Asia about 5-10% with potential for rapid growth[27]. Others report that algorithmic trading accounts for half of all trading on the New York and London exchanges[28]. Demand for 'trading at the speed of light' and the need for shaving nanoseconds of latency has seen organisations like Telstra make significant investments in cable systems linking global markets and exchanges.

- **Everything is intelligent**
  Intelligence is being built into an ever-increasing range of devices, infrastructures and environments. Looking at the consumer space, every day we see announcements for intelligent appliances[29], intelligent vehicles[30], home automation products and even intelligent toothbrushes[31]. For signs of the rise in embedded intelligence, we only need to look at shipments of the processors used to control consumer devices, where 32-bit microcontrollers and System-on-Chips are rapidly supplanting the relatively dumb 8-bit microcontrollers traditionally used to power appliances, etc. It's clear that this is being driven by the need to provide the network connectivity described above[32].

- **Everything that can be measured will be measured**

  As we interact with the world, whether physically or digitally, we leave footprints. In the digital world, for example, our trail includes clickstreams on websites we visit, our search queries, the content we view and much more. Technologies such as Micro Electro-Mechanical Systems make it possible to deploy arrays of highly advanced sensors both widely and very cheaply. Janusz Bryzek from Fairchild Semiconductor talks of a trillion sensors deployed by 2020[33] – that's about 140 sensors per person. In fact, of all the connected devices mentioned above, IDC predict that 14% will be fully autonomous devices largely devoted to collecting data[34].

- **Analytics will remove friction from business and lifestyle processes**

  The final and key premise of the Smart Connected World is that analytics will be used to improve decision-making and to remove friction from existing processes of all kinds. In Section 3, we saw consumers' thirst for personalisation. We saw that customers believe financial services providers have more than enough information to be able to tailor products and customer service to suit them. The first four premises above ensure that financial service providers have more data available than ever before to understand their customers' needs and their context. There are also substantial operational economic benefits to be had. GE estimates the dividend of the Smart Connected World for industrial applications alone to be over US$32 trillion annually[35]. And when IT consulting group Tata conducted a broad survey on Big Data activity, they found that financial services organisations had the second highest expected return on investments in Big Data, with an expected mean ROI of 69%[36].

Infographic: Vision for the Smart Connected Financial Services World

- Application processor shipments grew 47% in 2013
- Shift from micro-controllers to general purpose CPUs and System-on-Chip.

- 30-75 Billion connected devices by 2020
- 3% of all "things" on earth will be connected in 2020

- Amount of data in the world doubles every seven months
- Over four Zettabytes in storage currently

- 1.5B smartphones globally
- Smartphone penetration: Hong Kong/Singapore 87%, Malaysia 80%, Australia 75%, China 71%, Indonesia 23%

Sensor Cloud

Interconnected Cloud Storage

- 177M wearables by 2018
- 515M health/ fitness/ wellness sensors shipped annually by 2017

Sensor Cloud

Interconnected Cloud Analytics

3rd Party Aggregators

- 60-100 sensors in new cars now - 200 by 2020
- 50% of new cars network connected by 2015, 100% by 2025

Sensor Cloud

- 5.7 connected devices & sensors per home in 2013 growing to 30 by 2018

Sensor Cloud

Marketing

3rd Party Aggregators

- Over 6.5M free Wi-Fi hotspots
- Nokia has mapped the interior of over 50k buildings and Google more than 10k

Sensor Cloud

Multichannel Contact Management

Alerting

- Over half of all trading on the NYSE and LSE is HFT
- Every millisecond lost in HFT, results in $100m pa opportunity loss

Anything that can be measured will be measured

Everything is intelligent

Dynamic Pricing

Operational Management

- 500M Tweets daily
- 189B emails daily
- 400M Snapchat "snaps" daily
- 4.75B items shared on Facebook daily

Fraud & Risk

Product Design & Selection

- 2.5B Internet users globally
- 131k person*years* spent online daily

Electronic Trading

- In Australia: 14.5M card transactions, 7.4M direct entry & 2.2M ATM transactions daily
- Globally 9M PayPal transactions daily

Analytics removes friction

Everything is connected

Everyone is connected

4.2 The Financial Service Provider Environment – Data, Infrastructure Analytics and Actioning

'Data helps us form a picture of the customer's life journey, the next step they will take and how we can help.'

Karen Ganschow – Westpac, Head of Customer Relationship Marketing

The first and most obvious impact of the Smart Connected World is data and lots of it! Financial services organisations already deal with large volumes of customer data – although this is typically transactional in nature. However, the Smart Connected World poses significant challenges to even the most capable data teams and advanced information architectures. One useful way to think about some of these challenges is the V7 model shown in Figure 9.

The data challenge posed by the Smart Connected World does not stop at organisational boundaries. It is important to recognise that in an area such as financial services, which touches on so many aspects of people's lives, much of the data required by analytics-driven competitors cannot be sourced internally. In fact, a survey by Tata indicated that 30% of the data used by financial services organisations across Big Data initiatives has been sourced outside the organisation[37].

The ability to manage and effectively integrate not just internal data, but also externally sourced data and insights, is a key capability for analytics-driven organisations and is only likely to become more important into the future.

Analytics-driven business in a Smart Connected World requires access to unique and often-rare skill sets that are increasingly in short supply[38]. This fact was highlighted in a study by The Economist Intelligence Unit, which showed lack of in-house skills was considered the most reported hindrance to adopting such business models globally. Indeed, 45% of respondents in the ASEAN region saw lack of in-house skills as the biggest blocker to adopting analytics-driven business models[39].

Today, financial service providers hold a unique and hard won position of trust with customers. However, increasing public scrutiny regarding how potentially sensitive information about individuals can be mishandled, means that trust can dissipate very quickly if constant and vigilant focus is not maintained on information and data security.

Maintaining such focus in the face of the challenges described in Figure 9 is no easy task, even for the most capable financial service organisation. Similarly, many organisations are challenged to strike an optimal balance between the agile and innovative analysis and uses of data with the security and governance of data, required to maintain consumer trust and meet regulatory requirements.

Today's financial institutions also have an enormous advantage over likely competitors in terms of the quality of the data that they hold. More than a decade of focus on data governance and quality by the Australian Prudential Regulatory Authority and similar regulators internationally has provided an advantage that flows through to analytics. The better the data you start with, the more reliable the results of your personalisation, contact and marketing analytics.

Today's financial institutions have an enormous advantage over likely competitors in terms of the quality of the data that they hold. The better the data you start with, the more reliable the results of your personalisation, contact and marketing analytics.

Figure 9: The V 7 Model
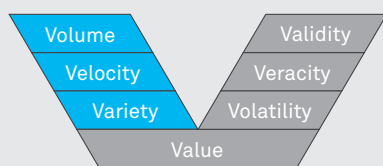
The first three Vs talk about the flow of data. Obviously the Smart Connected World generates vast volumes of data about customers and prospects. Soaring volumes are accompanied by increased velocity – a growing demand for real-time and near-real-time analytics driven by ever increasing service expectations from customers. This has been one of the key drivers of demand for high-speed, low latency networks, particularly for trading environments. Finally, the sheer variety of data types, sources, structures and formats is also increasing rapidly. Deciding how to best handle a particular single customer call may involve analysing structured data (e.g. traditional CRM and transaction records), unstructured data (e.g. speech analytics of the in-flight call) and semi-structured data, such as customer comments on social media.
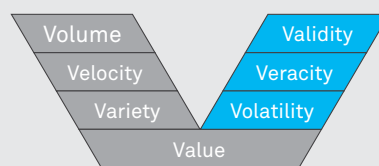
The next three Vs refer to properties of the data we use and the insights we infer from it. Data and the insights we infer from it are not absolute and immutable things. They exist in a spectrum of validity (how correct, accurate and precise it is) and veracity (how complete, how relevant and how up-to-date it is), which must be continuously managed if we are to understand the applicability of those insights. What is more, both the data and the insights age – they are volatile – and the levels of volatility are highly variable.
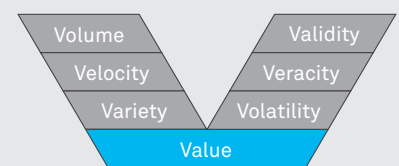
Finally, one major data challenge posed by the Smart Connected World is not technological. Obviously data and the insights derived from it have intrinsic value. However, organisations typically have not yet developed the tools to treat them alongside other classes of assets whose value is actively measured and managed. In fact, value is often not ascribed to data and insights at all, but rather to the infrastructure hosting them or to the processes they impact. This is one possible factor driving the fragmented organisational approach we saw in Section 3 of this report. This issue has seen the rise of a new discipline, often referred to as infonomics, which is the study of the economic value of data and information. The Electronic Trading part of the financial services market is one exception. Real world mining companies understand the value of geological data; for institutions, the equivalent is their customer data.

4.2.1 Key Infrastructure Technologies

How best can we manage and interact with the vast amount of data available, so we can find new and useful relationships and ways of using that data?

Now let us examine just some of the key technologies that are being used by organisations to enable analytics-driven business in the face of the challenges posed by a Smart Connected World.

Advanced SQL – No SQL

Advanced SQL is a technology and market that is ready for prime time, with major IT platform players having in the past year planted their flag in this space through acquisition. The key question here is one that applies to any market that is in a consolidation phase: which players will get successfully integrated into their new parent companies and leverage the larger go-to market presence that big players provide? Advanced SQL platforms, such as those provided by IBM Streams, tend to be considered more enterprise grade and to have an appropriate resource pool.

No SQL is an early adopters' market where the brunt of technology is open source, tooling is crude (where it exists), and the vendor ecosystem is only beginning to establish itself. For early adopters of No SQL that can get access to previous skill sets (Hadoop skills are rare), it's time to look at pilots and prototypes. No SQL platforms such as Hadoop, DataStax, MongoDB are based on open source software and are not known to be enterprise grade. There is an acknowledged worldwide shortage of data scientists conversant with these platforms (see the Data Analytics Framework below).

Data Analytics Framework
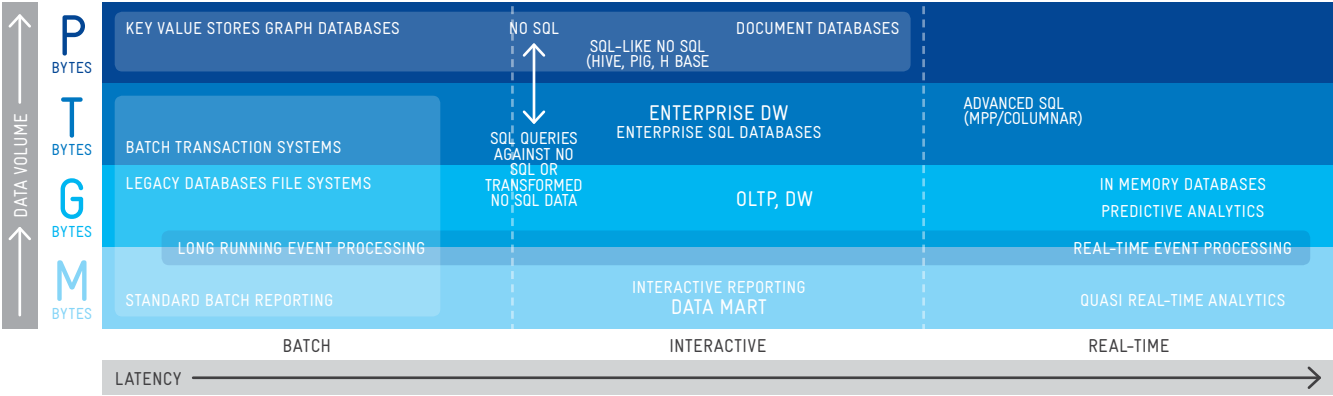
Source: Ovum, Big Data Strategy Report, 2012

Hadoop & Co.
Hadoop and a number of competing platforms are actually frameworks that consist of a number of items:

a) A way to distribute data and objects across massive networks of computers yet still retain the ability to access that data quickly;

b) A way to efficiently manage and distribute computing tasks across the network; and

c) Libraries and APIs, simplifying the task of writing programs to run across the network.

These frameworks have gained popularity for complex analytical tasks across large, and often distributed, farms of computing resources. Many of the major cloud platform providers offer Hadoop or alternative frameworks on their infrastructure.

In-memory Databases
Data stored in primary storage (typically called RAM) can be accessed much more quickly than data stored on secondary storage (e.g. spinning disks or Solid State Drives [SSDs]). So, logically, a database residing entirely in RAM will be substantially faster. Improvements in memory density and reductions in the cost-per-gigabyte of dynamic RAM (the most common type of RAM) make it economically feasible to keep much larger data bases entirely in primary memory. This is the concept of the in-memory database. Rapid developments in SSD technology and forthcoming memory technologies such as memristors[40], magneto-resistive RAM[41] and Restive RAM[42] promise interesting changes in the way data is stored and analysed.

Complex Event Processing
Complex Event Processing (CEP) involves combining streams of data from multiple (typically high volume) sources stream to look, in real-time, for priori patterns that indicate a particular event has just occurred or is likely to occur. For example, a particular pattern of withdrawals across the ATM network may indicate a fraud 'blitz attack' is underway; or a pattern of interactions across channels coupled with a pattern of transactions may indicate a particular customer has reached a critical decision point about whether to churn; or instructions based on a set of variables such as price, quantity or timing to execute an algorithmic trade without human intervention. By utilising large in-memory databases and statistical decision trees, CEP systems allow organisations to define patterns of interest and to trigger particular actions when those patterns are observed.

4.2.2 Key Analytics Technologies

Discovery Technologies
One of the key problems with vast streams of heterogeneous data is how best humans can interact with them to understand their structure and explore them to find new and useful relationships and ways of looking at that data. Probably the highest bandwidth channel human brains have to the outside world is our visual cortex. Many people find it easiest to think and communicate visually. Over the last decade, there has been significant research focus on tools and environments to help explore large data sets using the power of the visual cortex.

Some of that focus has been on new display paradigms from simple word clouds to graphical representations. Others have focused on the environment itself, creating large case immersive facilities.

Human language is also a very high bandwidth channel for our brains to interact with the outside world. Classical speech interfaces are typically simple command-response. Natural language interfaces fronting cognitive systems enable much richer and more flexible aspects of language such as abstraction, which can be helpful when interacting with large and complex sets of data. What is more, cognitive systems can shoulder some of the discovery load themselves – learning the types of relationships and features that are useful and interesting, and proactively identifying them.

Speech and Text Analytics
The conversations that customers have with staff and that customers have with each other are an enormously rich source of information about the customer's needs, interests and their attitude to the organisation. Text (and speech transcribed into text) can be simply mined for keyword 'triggers' or, using the types of technologies mentioned in this section, can be analysed holistically in the context of a complete conversation. More advanced speech analytics also look at features like pacing, tone and vocal stresses to estimate the customer's emotional state. Are they confused? Angry? Eager? Is their sentiment becoming more or less positive as the conversation progresses? This is potentially critical information to help inform how the customer should be treated.

Social Analytics

While conversations are extremely rich sources of information, knowledge of the personal connections and social structures through which they occur is also extremely valuable. Social Network analytics typically use information exposed by social platforms such as Facebook, Twitter and Snapchat to understand the structure and dynamics of these relationships. It seeks to answer questions such as which individuals are influential regarding a particular topic and who do they influence? Which customers are genuine advocates and which are detractors? Another branch of social analytics – social monitoring – looks at the content of publicly available posts on popular social platforms to identify artefacts such as rapidly emerging news or trends and shifts in public sentiment.

Predictive Analytics

Predictive analytics is the overarching term for a wide variety of techniques aimed at predicting an individual customer's needs or actions based on data about their previous actions, the actions of their peers and their current context. Increasing the accuracy of predictions generally involves sourcing extensive and accurate records of the previous behaviour of the customer population (to create better predictive models) and instrumenting interactions with the individual customer to provide better data to feed into those models. The use of predictive analytics in an area as wide ranging and with decision points as critical as financial services obviously requires access to varied and extensive customer data. This reinforces the point made previously in this section that the ability to effectively integrate internally and externally sourced data will become an increasingly critical capability.

Case Study 1. Bloomberg uses social analytics to support traders

To help traders using its professional desktop trading tool, Bloomberg provide tools to help traders understand the flow of social commentary regarding current or prospective investments. Traders are provided with a stream of content and trending topics, mined from Twitter, related to the investment. Additionally, sentiment analysis of the content stream gives an indication of the state of public sentiment regarding that investment[43].

4.2.3 Key Technologies for Actioning Insights
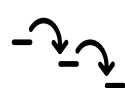
Next Best Action

Next best action (NBA) technology (also known as next best offer technology) primarily focuses on guiding a contact centre agent or staff member on the best course of action to take with this customer. In reality, most organisations simply limit the recommendations to the most likely products that could be successfully up-sold or cross-sold to this customer. More mature organisations use NBA systems as the basis for personalised advice and recommendations. NBA systems are used primarily on inbound contact channels. Ideally, the analytics should be dynamic, including information about the state of the current in-flight contact; however, many organisations limit NBA advice to predetermined recommendations.

Intelligent Contact Management

One of the major levers financial services organisations possess to influence the choice of their customers is by directing inbound contacts to the right person to handle that contact. In some cases, the rules for routing the contact are straightforward, as would be the case for a customer with a designated relationship manager. For other customers, a more detailed understanding is required, including factors such as the likely intent of the customer, the likely impact of current contact on customer value and customer satisfaction, the previous history of contact regarding the likely subject, the costs associated with the various options for routing the contact, current resourcing and staff availability, the sensitivity of this customer to levels of service and much more. Modern intelligent contact management systems give the flexibility to use complex analytical systems to select the best routing strategies for this specific contact from this particular customer.

Targeted Marketing and Outbound Contact Management

A classical use case for analytics-driven decision making is to ensure that marketing messages, offers and content are targeted as tightly as possible at those who are likely to perceive that contact positively. There are many drivers for accurate targeting, including reducing the cost of marketing, decreasing the likelihood the customer will perceive the organisation as prone to spam, and increasing the ability to create highly personalised offers and messaging, which in turn maximises the likelihood of conversion. Ultimately, the desire of the organisation to understand the customer's context and predict their needs must be balanced against the customer's desire for privacy.

Scheduling and targeting of outbound contact beyond marketing is a complex discipline. On the one hand, outbound contacts can be extremely effective at limiting the impact of a poor customer experience and at influencing the customer during critical decision points such as decisions to churn or during major life events. On the other hand, outbound contacts that are mis-targeted – which occur at the wrong time or on the wrong channel – are wasteful and can easily damage a customer relationship. Analytics-driven selection of targets, times, and channels can assist in improving the performance of outbound contacts.

Case Study 2:
Westpac's 'Know Me' Program

Westpac

Westpac's 'Know Me' program uses customer analytics to execute effective customer interactions on a one-to-one basis through every one of the banking group's online and offline touch points. The Westpac Group has more than nine million customers and a multi-brand strategy. Since launching in 2013, Westpac has completed 812,000 next best offer conversations with customers in branches, resulting in a 37% take up rate. Through the call centre, 490,000 customers have been targeted through the program, with 60% taking up an additional product, a significant uplift in Westpac's cross-selling efforts. Targeted online communications that appeared in 80% of online banking profiles also generated incremental revenue'[44].

4.3 Analytics-Enabled Experiences
We now bring the research in previous sections, together with the technology aspects discussed thus far, to provide guidance on how financial institutions can create valued experiences for their customers.

4.3.1 Experience 1: 'Contact.Me'

'It would save time explaining all my circumstances.'

Verbatim – Personalised Contact Centre/ Telephone Experience – Telstra Research, 2014

The relationship manager is one of the most powerful tools available to financial service providers who wish to deepen a customer relationship. The term relationship manager is interpreted very differently by different organisations. We refer to an individual who acts as the major touch point for a given customer into the organisation and its services. Telstra's research in Section 3 demonstrates that there is very strong customer demand for the personalisation and convenience that relationship mangers typically provide. Unfortunately, direct relationship management is relatively expensive and is typically restricted to very high value customers.

Some financial services organisations such as BBVA (see Case Study 3) seek to extend the relationship management functions using a personalised contact centre approach (as tested in Section 3 of this report). Typically, these use existing customer preference data and interaction history data to drive intelligent contact management solutions, allowing the customer to deal consistently with one particular agent who is familiar with their needs and holdings or a current matter. Additionally, this data can be used to prime the agent for an interaction – providing customer summaries, identifying in-flight episodes or providing next best action recommendations (for example cross-sell and up-sell opportunities relevant to this customer).

Other organisations are exploring augmented intelligence (AI) technology – one of the early pioneers being the Australian-born company MyCyber Twin, who use avatar-based web interfaces to create Intelligent Personal Agents (IPAs). Customers ask questions and give instructions using natural language and the virtual agent infrastructure exploits the customer profile and context data to interpret and action the requests. IPAs are software, usually accessed through a smartphone, which tie together:

• Awareness of personal context;
• Deep insights into customer behaviours and intentions, enabled by predictive analytics;
• The ability of natural language interfaces to interpret the user's goals; and
• A highly engaging smartphone interface, often including a speech interface.

The paradigm is that an IPA is always with you, always familiar with your activities, behaviours and needs, and always working to meet and anticipate those needs. Our research indicates that in the relatively brief time Intelligent Assistants have existed, they have been widely and rapidly adopted. Results show Singaporeans leading with 70% of the population using IPAs on smartphones, followed by Indonesia (66%), Malaysia (64%), Hong Kong (63%) and Australia (59%). The best-known IPAs today are general-purpose tools (such as Apple's Siri and Google Now). IPAs targeting specific applications such as banking and finance are emerging, including Lola from BBVA (as described in Case Study 4).

Case Study 3. BBVA Contigo

Contigo is BBVA's approach to providing relationship-centric personalised service to digital and telephone channels via a contact centre model. The initial purpose of Contigo is to replicate the best aspects of the branch experience.

Customers can have preferred Contigo agents with whom they regularly deal. Intelligent contact management is used to steer contacts to the preferred agent (subject to availability).

Contigo agents are highly cross-skilled to be able to support individual customers in a broad range of interactions[45].

Case Study 4. BBVA Lola

BBVA have also worked with SRI (who developed much of the technology used in Apple's Siri IPA) to develop Lola – a virtual agent for financial services. Lola provides a natural language interface to a range of transactions, financial information and educational material[46].

Contact.Me brings together the best of a virtual IPA and a real, but remote, relationship manager in a single, engaging interface.

Contact.Me combines and extends the vision of these two approaches, blending an intelligent personalised virtual financial assistant with a physical (but remote) relationship manager through a single, engaging and consistent interface.

Scenario 1 shows what an interaction with Contact.Me might look like. Note that even this simple interaction features:

- Awareness of accounts and holdings;
- Ability to identify relevant products and provide content relating to them;
- The ability to blend channels including mobile, Internet, email and phone;
- Knowledge of a preferred relationship manager, the ability to estimate their availability and the capability to schedule an outbound contact; and
- The ability to prime the relationship manager about the context of the contact.

Scenario 1: Contact.Me in action

Steve has a mortgage, owns a couple of small businesses and some investments. He's just finished lunch in his van and fires up his Virtual Relationship Manger app.

"What's the balance on the business account"?

"$57,818."

"...and the home loan?"

"$145,612.80 remaining Steve."

"Hmmm...can I use the business account to offset the mortgage?"

"Do you want to see the product description for a mortgage offset account?"

"No – I don't have time. Email it to me. Can I speak to Neil?"

"Neil should be available in about 10 minutes – do you want him to call you back?"

"Yes please."

A few minutes later Steve is on the way to his next job when his phone rings.

"Hi Steve, it's Neil. I believe you're interested in offsetting your mortgage. We've got a new product you might be interested in. Can we talk now or wait until you're not on the road?"

Diagram 1: Thematically Analysed – Personalised Contact Centre/Telephone Experience Concept (Australia)

Source: Telstra Research, 2014

Unlike some other blended channel concepts, Contact.Me does not seek to blur the line between support from virtual assistants and human agents. There is ample evidence (including the evidence reported in Section 3) that customers are not just accepting of self-service, but often actually prefer it. However, some tasks are more amenable to self-service and some are more amenable to mediated support – the boundary between the two varies from person to person and context to context.

Figure 10. Anatomy of Contact.Me
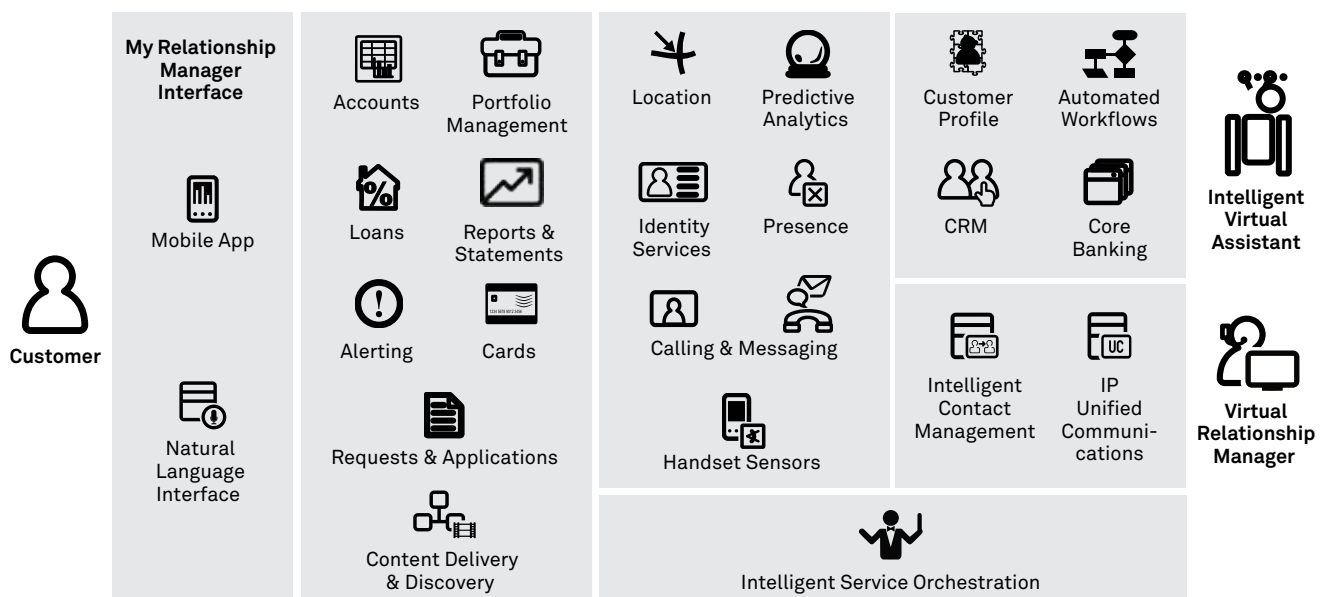
Source: Telstra Research, 2014

4.3.2 Experience 2: 'Branch.Me'

'Knowing that the branch staff know what I need and want and not having to explain myself.'

Verbatim – Personalised In-Branch Experience – Telstra Research, 2014

When we talk about analytics-driven personalised customer experiences, the research demonstrates that the branch can be both an excellent venue to differentiate via personalised interaction and a rich source of customer intelligence. The branch is still a highly preferred channel for relationship-centric activities, such as loan and mortgage applications and financial advice[47]. In fact, of all of the channel-centric concepts tested in Section 3, a personalised branch experience showed the greatest capability to influence satisfaction, advocacy, attractiveness and churn among those customers likely to use the service.

Case Study 5. The Branch as an innovation showcase

DBS

DBS in Singapore make extensive use of intelligent digital signage to engage visitors and passers-by. In-store and shopfront window displays equipped with Microsoft Kinect motion sensors detect people passing and engage them with highly interactive, entertaining, gesture-based content. They also perform analysis of passing traffic and people who interact with the platform. The branch ecosystem includes iPads (to display personalised content and to complete electronic forms), virtual digital queues, and intelligent virtual assistants to help customers[48].

The branch is, to some extent, a captive environment and potentially a highly immersive one. The Branch.Me concept turns the branch into a machine for sensing visitors, gauging how they engage with the branch and, where customers have opted in, for delivering personally optimised content and services.

The Branch.Me concept is underpinned by three key capabilities:

- Identifying visitors to the branch – so we can utilise our existing knowledge of them;
- Understanding the context of their visit to the branch – so we can optimise their experience; and
- Personalising their interactions with branch staff and branch infrastructure.

Obviously, the key enabler for any personalised experience is the identification of the visitor. A variety of approaches can be used – each with strengths and weaknesses:

- **Card check-in:** Existing customers swipe/tap an account card through a reader at the store entry;
- **Social platform or app check-in:** Visitors use either a social platform like Foursquare or a mobile application to check-in at a branch;
- **Video analytics:** Facial recognition is used on branch camera feeds to identify known visitors;
- **Wi-Fi analytics:** Wi-Fi devices (e.g. smartphones) each continually emit a unique signature – even when not connected to a network – which can be used to identify visitors in the branch; and
- **Bluetooth/Wi-Fi/Sonic or visible light beacons:** Beacons emitting a unique signature are placed in the branch. The visitor's smartphone senses the beacons and registers the presence with an app or a back-end service.

> Branch.Me is all about personalising the customer's experience while they are visiting the branch – should they opt in for this level of service.

Once we've established identity (at some level of confidence and with permission), we are in a position to utilise any existing knowledge we may have about the visitor to help tailor their experience in the branch. Case Study 5 demonstrates what this branch digitisation may look like.

Modern front of house systems can offer cues to staff members as to the identity of the visitor, the nature of their relationship with the bank and the branch, and even offer details of any in-flight episodes with the customer. When integrated with next best action systems, they can also prompt staff regarding appropriate cross-sell and up-sell offers for any given customer.

Intelligent signage allows content to be tightly targeted to the current audience – even down to an individual level. Some intelligent signage is audience-aware and can provide valuable data about the audience, for example, embedded cameras can estimate demographics, measure audience dwell times and even track which items on-screen draw the viewer's gaze (and hence their attention).

Staff tablets offer the opportunity to service a given customer anywhere in the branch. Using an approach called clienteling, pioneered in retail environments, staff can utilise tablets to show customers content such as interactive videos and live models to demonstrate the impact of particular choices.

Interactive surfaces have great potential for creating engaging collaborative experiences where, for example, a customer and a staff member can explore different scenarios and visualise the impact on the customer's portfolio.

Figure 11. Anatomy of Branch.Me

Infrastructure Sensing
Smart Signage · Cameras · Motion Sensing · Card Readers

Smartphone Sensing
Wi-Fi Beacons · Bluetooth Beacons · Wi-Fi Monitoring · Location Services · Light Beacons · Sonic Beacons · QR Codes · NFC Tags

Analytics
Video Analytics · Predictive Analytics · Facial Recognition · Speech Analytics · Real-Time Decisioning · Footfall Analytics

Insights
CRM · Customer Profile · Rules · Behavioural Models

Actioning Systems
Staff Applications · Next Best Action · Content Targeting · Messaging

Staff Devices
Staff PCs · Staff Tablet

Customer Devices
Smartphone

Collaborative Devices
Intelligent Surface · Videoconferencing Unit · Staff Tablet

Self-Directed Devices
Kiosks · Digital Signage · Interactive Video Wall

Source: Telstra Research, 2014

Of course, interaction is not limited to branch infrastructure. Most customers already carry capable, highly engaging smartphones, which are capable of playing a key role in an omni-channel branch experience. The smartphone can be used to deliver content such as offers, product collateral, educational material and even details of the collaborative planning scenarios discussed above. It can also be used to facilitate virtual queuing and as a means of secure identification.

We've seen numerous "branch of the future" initiatives focused on digitising the branch and engaging the customer. However, most of these fall short of the Branch.Me concept. The real value is in positioning the branch as a key component of a holistic, blended, and above all personalised omni-channel approach to financial service delivery.

Scenario 2: The Branch.Me in Action

Jalyn visits a flagship branch of her bank. The mobile banking app on her smartphone detects a pre-registered (opted-in) app and notifies the branch's systems of her presence.

She talks to the greeter on the floor, indicating she'd like to talk to an investment specialist. The greeter tells her that one will be available shortly.

As she wanders past a display, it invites her to view a quick interactive video about balancing risk and return. The system notes Jalyn leans towards conservative strategies, consistent with other videos she has viewed on the banks website through her smartphone and tablet devices.

Ben is an investment adviser. His tablet shows him Jalyn's location and indicates she has a term deposit just about to reach maturity. He wanders over.

"Hi Jalyn, I'm Ben. Let's have a look at some investment options."

He takes Jalyn to a bench. As he puts his tablet on the interactive surface, details of Jalyn's deposit and a number of relevant investment products appear on the interactive bench top.

Ben can interactively show Jalyn how her investment behaves as she balances it across different products.

Jalyn doesn't want to commit immediately so Ben drags a couple of the profiles Jalyn is most interested in to her account symbol and they're instantly available for her to read through, either using the mobile banking app or online.

Diagram 2: Thematically Analysed – Personalised In-Branch Experience Concept (Australia)

Source: Telstra Research, 2014

4.3.3 Experience 3: Digital.Me

'Makes me more knowledgeable about my situation.'

Verbatim – Personalised Digital Banking Experience – Telstra Research, 2014

All of the trends reported in the first half of this section point to the growing importance of the distributed body of data and insights that organisations use to form a picture of who we are, how we behave, what is important to us, what we like and what we don't like. This corpus – sometimes called the digital self – is used every day as the basis for decisions about what products and services we will be offered, how they will be priced, how organisations and other people will engage with us, how we will be provided with customer services, and whether we are trusted – it becomes our digital self. Nowhere is the state of our digital self more critical than in financial services.

Digital.Me, shown in Figure 12, conceptualises how the financial service provider can bring together the disparate elements of the digital self in a way that benefits the consumer, and how a highly trusted financial service provider can help customers to manage access to their digital selves. As a consumer, Digital.Me provides:

- One place where I can get a consolidated personalised view of my financial services, and the state of my personal finances, including my saving spending patterns – and some of the factors driving them;

- A place to keep important documents of all types, ranging from the title document for my house to a receipt for the stationery I just bought at the local office supplies store;

- Education, tailored to me, about the behaviours that suit what I want from my financial services, and encouragement to implement them;

- Strong protection from fraudulent use of my financial services or my data; and

- Control over whom I share my data with and how they use it.

There are five key capability areas enabling Digital.Me. The first of these are the aggregation services that gather together the various streams of data that make up the digital self from a financial services perspective (such as transaction and account records, payments and bills). Forrester[49] talks about four categories of data that make up the digital self, all of which Digital.Me must support:

- **Created.** Content explicitly uploaded by you, e.g. a house title, a will or a copy of a birth certificate, or statement of advice;

- **Mutual.** Information mutually held by you and your service providers, e.g. passwords, explicit customer preferences, PINs, Biometrics;

- **Received.** Transaction and activity records, e.g. invoices and bills; and

- **Recorded.** Data generated as part of your day-to-day activities, e.g. payment transaction records.

Secondly, Digital.Me makes extensive use of analytical services. Behavioural models and predictive analytics are used to understand individual spending, saving, borrowing and investing patterns, as well as to understand what drives those activities. Social analytics help to identify peer groups the user can be compared with, as well as to identify events that may change behaviours with regard to financial services. Market analytics deliver insights into the broader economic environment, whether at a macro or micro level.

Digital.Me uses and exposes a wide range of services to establish the identity of the users and to be able to gather and provide evidence regarding that identity, whether to internal systems, or third party-provided services. Globally, the financial services industry continues to struggle with identity paradigms that balance the need for stronger evidence of identity with ease of use and minimal intrusion on transactions such as purchases. Even as adoption of two-factor authentication continues to grow in the industry, many organisations and some domains are seeing a need to push to three and four factor authentication – and beyond that to adaptive multifactor solutions. As the connected device most strongly related to the individual and most frequently on the person of the individual, the smartphone and all its extensive capabilities is a key component of Digital.Me identity services.

Central to Digital.Me is easy-to-use, fine-grained, access control. This enables the customer and their financial service provider to tightly and explicitly control which services and what data regarding the customer is exposed to third party service providers (for example, retailers or other financial service providers) and to other individuals (such as family members or financial advisers).

Finally, at the core of Digital.Me is a range of personal financial management tools to help the customer understand and optimise their finances and their financial services in an intelligent and highly personalised way: tools to assist with effective financial planning; tools to help the customer understand their position in an increasingly complex financial environment; tools to help the customer identify and take advantage of opportunities; and, importantly, tools to help protect finances and sensitive information about themselves and their loved ones (see Case Study 6). Chart 12 features how these smartphone-enabled activities have become pervasive across the Asia Pacific region, particularly in Indonesia and Hong Kong.

Case Study 6. Moven

Moven, a US start-up, provides a mobile personal finance management tool that helps customers understand the impact of their social life on their spending. Moven has no physical branches, but relies on a banking partner (currently CBW Bank) to provide core banking services such as the underlying accounts.

Using a well-designed, modern and engaging user interface, Moven provides an array of features aimed at helping users understand their spending behaviour and encouraging good spending and saving behaviours:

• Users can set saving targets, track their progress against them and even receive rewards for progress against those goals;

• Customers can track and categorise their spending, either by funneling payments through a debit MasterCard provided by Moven's banking partner or from third party accounts;

• Moven provides analysis of how the customer's spending patterns are changing over time; and

• To encourage users, Moven provides gamification features relating to spending behaviour, aimed at encouraging good spending and saving behaviours.

Chart 12: Digital Financial Services Smartphone Behaviour

Those who use a smartphone to do each activity across total population (%)		To Access Financial Services	To Access Updates on Financial Markets	Use Intelligent Assistants	Use Video Calling	Use tools to monitor financial performance on savings, borrowings, investment and spending	Share Trading	Learning how to manage finances on savings, borrowings, investment and spending	To Access Financial News & Information
Australia		42	9	59	40	14	5	8	10
Singapore		63	31	70	55	26	14	21	34
Hong Kong		68	43	63	50	28	30	24	46
Malaysia		53	24	64	64	27	26	20	28
Indonesia		64	36	66	73	36	39	28	37

Average of impact on consideration when opening a new account and impact on consideration when switching amongst those who find concept appealing and are likely to use

■ Indicates the highest penetration across Asia Pacific

Source: Telstra Research, 2014

Digital.Me isn't just about using analytics to help the customer manage their finances more easily and effectively, it's also about creating a platform that will allow providers to offer as yet unthought-of new services that customers will value.

Scenario 3 gives one picture of how a customer might interact with the Digital.Me concept. It also shows how financial service providers can leverage the Digital.Me concept to create new and monetisable services – acting as a trusted party to facilitate transactions and manage the flow of data between the customer and third parties, such as retailers.

Scenario 3: Digital.Me in action

Lianne gets a notification from her bank's Digital.Me application that she's reached the savings target she set for the deposit on a new home entertainment package. The message also tells her that a retailer Lianne has used before is offering triple rewards points at the moment.

Later that day, Lianne visits the retailer, decides on an entertainment package and negotiates a great deal with the salesperson. Lianne opens the Digital.Me app on her smartphone, enters her PIN and selects "Finance a purchase." Digital.Me asks Lianne to say the answer to a secret question. Once her answer and her voiceprint have been verified, Lianne enters a few details. Digital.Me analyses her saving- and spending pattern, including when the family's major bills are expected, and immediately approves a personal loan for her dream system. Digital. Me generates a simple online loan agreement form for the balance, and Lianne applies her digital signature to agree to the loan on the spot.

The salesperson rings up the sale and asks for Lianne's mobile number. Digital.Me draws on several factors – including her smartphone location and the authentication steps she has already taken – to satisfy her bank that Lianne is the person in-store and using the phone. A message pops up on the smartphone: 'To authorise payment of $14,750 to Home Entertainment Palace, reply "OK 77665."' Lianne replies and payment is immediately transferred via the real-time payment network.

A few seconds later the receipt, warranty, loan agreement and loan product disclosure statement appear in Lianne's Digital.Me document safe.

Diagram 3: Thematically Analysed – Personalised Digital Banking Experience Concept (Australia)

Source: Telstra Research, 2014

Today, we are already seeing some aspects of the Digital.Me concept coming to life, with Personal Finance Management (PFM) tools such as those provided by Moven (see Case Study 6) and the recently acquired Simple Bank, American Express' Bluebird and Serve platforms, and Mint from Intuit, perhaps the longest established non-bank PFM.

Additionally, comprehensive identity solutions are emerging from bank consortia and mobile operators, including BankID in Scandinavia[50] and KDDI's Au brand in Japan[51].

Federated identity solutions from global Internet companies such as Facebook and Google offer huge customer reach, but, to some extent, risk displacing the trust relationship between the customer and their financial service provider.

Figure 12: Anatomy of Digital.Me
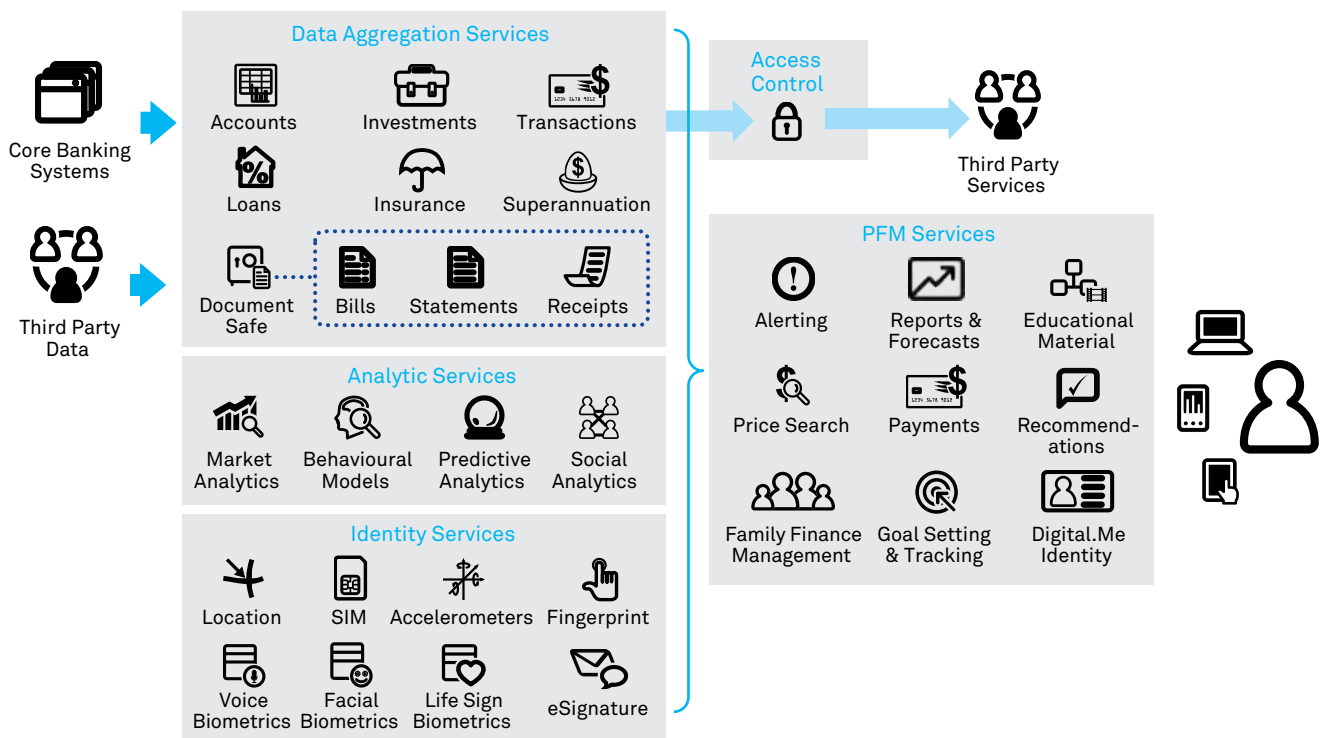
Source: Telstra Research, 2014

In Section 3, we saw that consumers expect their financial service providers to use the data at their disposal to deliver better, more personalised and streamlined customer experiences. We also saw that customers are willing to recognise those providers who do successfully deliver such experiences. Earlier in this section, we also examined how the evolving Smart Connected World makes a much broader array of data available to help us understand the customer, their needs and their current context – each of which is a prerequisite for delivering highly personalised, low friction services. Of course, the practicalities of collecting the required data, analysing it and actioning the resulting insights will challenge many organisations – as will the paradigm shift required to embrace an analytics-driven mode of operation. However, the three customer experiences we portrayed show that this paradigm shift could be game changing.

5.0 CONCLUSIONS

This report has demonstrated that the financial services industry has entered a new era where the pace, intensity and impact of change in how information is used to service customers can easily outstrip the capability of incumbents, creating a gap that is being exploited by new entrants.

Access to data and the ability to effectively manage analytics will decide which financial institutions will prosper and which will be supplanted during this next wave of transformation.

What we have observed is:

- The intensity of competition has increased exponentially. This is only likely to accelerate as the twin mega trends of digital proliferation and inter-generational wealth transfer make traditional financial services markets increasingly attractive for new entrants.

- The epicentre of disruptive innovation is Generations X and Y. Today, these generations are responsible for more than half of all spending and borrowing in Australia (and probably other developed nations too).

- Personalisation, Network Effects, Cloud Business Models and Open Source Artificial Intelligence based Technologies are the forces that are defining where and whether new companies enter the market, and whether traditional players adapt or are out-competed.

- There is a major gap between strategic priority and incumbent readiness to compete analytically. New entrants are already exploiting this gap, so incumbents are seeking to close the gap through major investments in capability.

- Analytics-enabled financial services and experiences have the capacity to radically alter consumer perceptions across the Asia Pacific region and to support customer acquisition, engagement and retention strategies – whether executed through a branch, contact centre or digital channel.

- The results indicate that in all countries, each of the five analytics-enabled concepts we researched achieved high appeal levels, and the nine experience metrics tested achieved positive perceptual impacts for each concept. This means that either incumbents or new entrants have the ability to compete and win on the basis of analytics-driven services.

What do we need to do?

- As these digital services would be enabled by large-scale analytics, it is now becoming clear that modern financial services providers need to have well-developed analytical information gathering capabilities.

- For new entrants, Generations X and Y are seeking offerings beyond traditional financial services products and are prepared to look outside traditional providers to fulfill these needs.

- For incumbents, a limited window of opportunity exists to adapt, close the gap quickly and exploit their existing advantages, namely their unique position of **trust, strong customer relationships** with Generations X and Y and **multiple touch points**.

- We show three analytics-driven customer experiences highlighting how channels can evolve through embracing an analytics-driven approach:

  1. **Contact.Me:** Combines a personalised contact centre and intelligent personal assistant, blending an intelligent personalised virtual financial assistant with a physical (but remote) relationship manager through a single engaging consistent interface.

  2. **Branch.Me:** Turns the branch into an environment for identifying visitors, understanding their intent and how they engage with the branch in order to provide personally optimised content and interactions with branch staff and branch infrastructure.

  3. **Digital.Me:** Shows how providers can combine analysis of saving, spending, borrowing and investing behaviours with social analytics and broader market analytics to create online and mobile tools that help customers more effectively manage and use financial services.

- This vision of truly analytics-driven customer service is underpinned by secure and highly scalable interconnected storage of customer data connected to a wide range of specialised analytics services (often hosted on high-performance cloud platforms) by high-speed, low latency networks.

- For all players in the market, entering into analytics needs to be done so safely and in a way that respects customer privacy, enhances trust, and delivers greater value to consumers.

6.0 ABOUT THE AUTHOR

Rocky Scopelliti is the Group General Manager, Industry Centre of Excellence at Telstra Global Enterprise Services. Rocky is Telstra's thought leader in Banking, Finance & Insurance.

Rocky has more than 20 years' senior management experience in the information technology and financial services sectors, encompassing Product Development, Strategy and Planning, Business Development, Research and Strategic Marketing.

Over the past six years, Rocky has authored a number of thought leadership research reports that provide recommendations on technologies that financial services institutions can leverage in order to better serve customers, improve productivity and drive growth. These include:

- ICT as a Driver to Improve Service to Generation Y for Financial Services
- Servicing Micro Businesses – What Financial Services Need To Know
- Mobile Innovation – The next frontier for growth and productivity for insurers
- 2012 for the Financial Services CIO – Why agile IT strategies are key to meeting the requirements of a new financial age
- The Digital Media Bank – how video can better engage your customers and workers

- Cross Industry Innovation – the secret may well be in another industry (co-produced)
- Towards a Clever Australia – Banking, Financial Services & Insurance Industry Insights Whitepaper
- The Digital Investor
- Analyse This, Predict That – How Institutions Compete and Win with Data Analytics

Educated in Australia and trained in the United States, at Sydney University and Stanford University respectively, Rocky has a Graduate Diploma in Corporate Management and a Masters in Business Administration. He is also a Graduate and Member of the Australian Institute of Company Directors.

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