MILLENNIALS, MOBILES & MONEY

The Forces Reinventing
Financial Services

IT'S HOW
WE CONNECT

CONTENTS

FOREWORD

MILLENNIALS HAVE BECOME A LEAD INDICATOR TO DISRUPTION IN FINANCIAL SERVICES

WELCOME

Over the past eight years, I've researched and reported on how demographic changes and technology are affecting the financial services industry. This year, I'm pleased to present the eleventh in my series of thought leadership reports: Millennials, Mobiles and Money – The Forces Reinventing Financial Services.

This report is a window into how the enigmatic Generation Y (now the largest demographic group), will transform the financial services industry as employees, customers, investors and policy makers, according to the role these self-styled entrepreneurs want finance to play in their digitally driven lifestyles, business and society.

2014/15 was an inflection point with four significant developments propelling the financial services industry onto a new trajectory.

1. Millennials moved in – In 2014/15, Millennials (aged 18 to 34 years) overtook Baby Boomers as the largest global demographic group and emerged as the number one source of global income, spending and wealth creation. Their representation became the largest in history with a population of one in three persons globally (two billion) – 86 per cent of whom live in emerging markets[1].

Millennials dominate employment and are predicted to make up as much as 42 per cent of the workforce in Australia by 2020[2], and 75 per cent in the USA by 2025, generating more than US$8 trillion in annual income[3]. They are the most highly educated, media-saturated and ethnically diverse generation ever. Their economic power is greater than in any previous era. Their spending power alone is estimated to be US$10 trillion globally[4]. Furthermore, inter-generational wealth transfer from their Baby Boomer parents will see the personal wealth of this generation of digital heirs increase by an estimated US$59 trillion over the next several years[5]. This will create the largest spill of wealth and financial relationships we have ever seen. Looking further out, their share of global financial assets is predicted to climb to 28 per cent by 2030[6].

Millennials will cause seismic political, economic and social shifts as they permeate society.
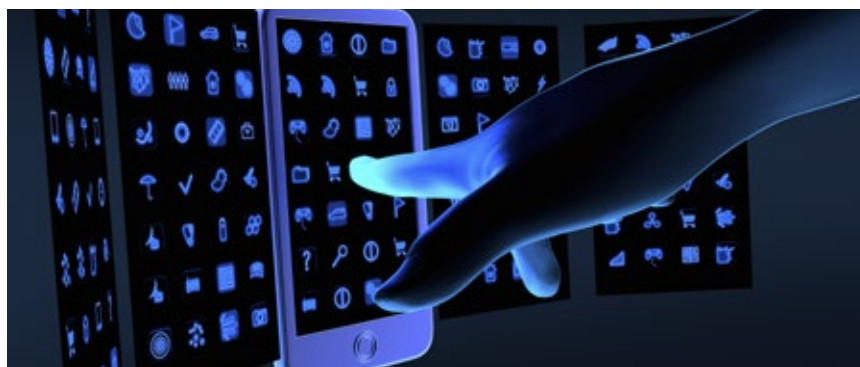
2. Mobile-first financial services – In 2014/15, the mobile device became the primary technology used by consumers to access financial services in many developing and developed nations with more than 50 per cent of interactions with banks conducted through mobile devices[7]. While there are more than one billion mobile banking users today, it is now forecast that by 2020, 37 per cent of the global adult population (over 15 years) will be mobile banking users[8]. In its 2014 annual review, the Bill and Melinda Gates Foundation predicted that by 2030, two billion people in unbanked and under-banked communities will be storing money and making payments using mobile devices[9].

Social media has become the theatre for Millennials to discuss money matters. In 2015, Millennials drove 40 per cent of the financial conversation on Facebook – 76 per cent of which occurred on mobile devices[10].

The industry crossed into a mobile-first financial services world with 'financially mobilised consumers' accessing value propositions and advice only through mobile devices and delivered by mobile-led players – many of which have existed for five years or less.

Millennials may be the first generation to live their lives never requiring, nor engaging with, a traditional institution and only ever associating the word 'branch' with a tree.

3. Mobile app economy augments 'fintegration'[11] – Mobile applications and services are rapidly overtaking the World Wide Web as the key digital channel. Revenues from these mobile apps and services are predicted to reach US$100 billion[12] with a staggering 180 billion apps downloaded. The mobile development community has exploded globally too with more than 2.3 million mobile developers – 91 per cent of whom are in Asia, North America and Europe[13]. Spending on mobile enterprise applications by financial institutions reached US$752 million (Banking $436 million, Insurance $148 million and Securities & Investment $168 million) in 2014/15, with growth expected to be a whopping 21 per cent CAGR through to 2019[14].

Over the past five years, fintech start-ups targeting Millennials attracted 16 per cent (US$3.7 billion) of total fintech venture capital funding with more than 150 deals spanning mobile banking, crowd funding, payments, personal investing, wealth management, loans and credit risk type apps[15].

Convergence of financial and lifestyle services fused by digital technology will blur the boundaries between industries, product lines and the actual providers of services.

FOREWORD

4. Fintech fraternisation: the collaboration conundrum – Digital partnerships have split financial services institutions down the middle. Investment in fintech grew at three and a half times the rate of the overall venture-capital market (201 per cent versus 63 per cent), hitting the US$13.8 billion mark across 730 deals[16]. But the key question is: who will profit from this investment in innovation?

The answer is likely to be those who execute strategies and models based on sharing critical assets, rather than restricting access to them. Collaborative institutions know how to leverage the innovation horsepower of fintech, which is not easily imitated by incumbents or competitors. They leverage their complementary assets (e.g. balance sheet capacity, capital, scale, customer base, distribution channels, regulatory compliance and risk management). Yet today, only 50 per cent of financial services executives we surveyed reported that their digital tie-ups with

partners inside and outside their industry have already proven their value 'beyond doubt'[17]. Still more studies indicate that 90 per cent of bankers believe that fintech will have a significant impact on the future of the industry – one third believe that fintech will win an equal share of, or even dominate the market[18]. This collaboration gap illustrates the significant 'platformification' opportunity (referred to in this report also as 'finance-as-a-service') for traditional players, as the convergence of digitally-fused financial and lifestyle services accelerates.

The key risk for traditional institutions is that there's no shortage of players from adjacent industries prepared to share critical assets to close the innovation gap – and win the value from doing so.

This study across eight countries within the Asia-Pacific region, the United Kingdom and the United States of America provides a 360-degree review of disruption within the industry and a glimpse of the next generation of financial services. Our insights suggest that 'trust, relationships and technology' is the new trinity for Millennials, who have chosen the smartphone as their connection between the physical and digital worlds.

First, we explore five mega trends changing the financial services industry and the pressure points and prizes that are resulting in emerging clusters of innovation. Second, we present new research on Millennials – their app behaviour and their attitudes to disruptive experiences at major life stage events and in financial activity categories (save, spend, borrow and invest) when they control their personal data. Thirdly, we take a look at fintechs and how they are responding to this unmet demand by identifying those disruptors specifically targeting Millennials, as well as who is financing them. Lastly, we look at technology through life's remote control – the mobile phone – and where, in order to digitally transform, institutions will need to adapt to create new networked ecosystems for the provision of transaction, risk management, investment and financing services.

The insights presented in this report were only made possible through the generous participation of industry, contributions from research partners and the many wonderful Millennials I interviewed; to all I am sincerely grateful.

We welcome the opportunity to provide you and your management team with an in-depth briefing on what these insights mean to your institution. At the back of this document, we've provided a list of contact numbers. Please also visit **telstraglobal.com/millennials** for further information.
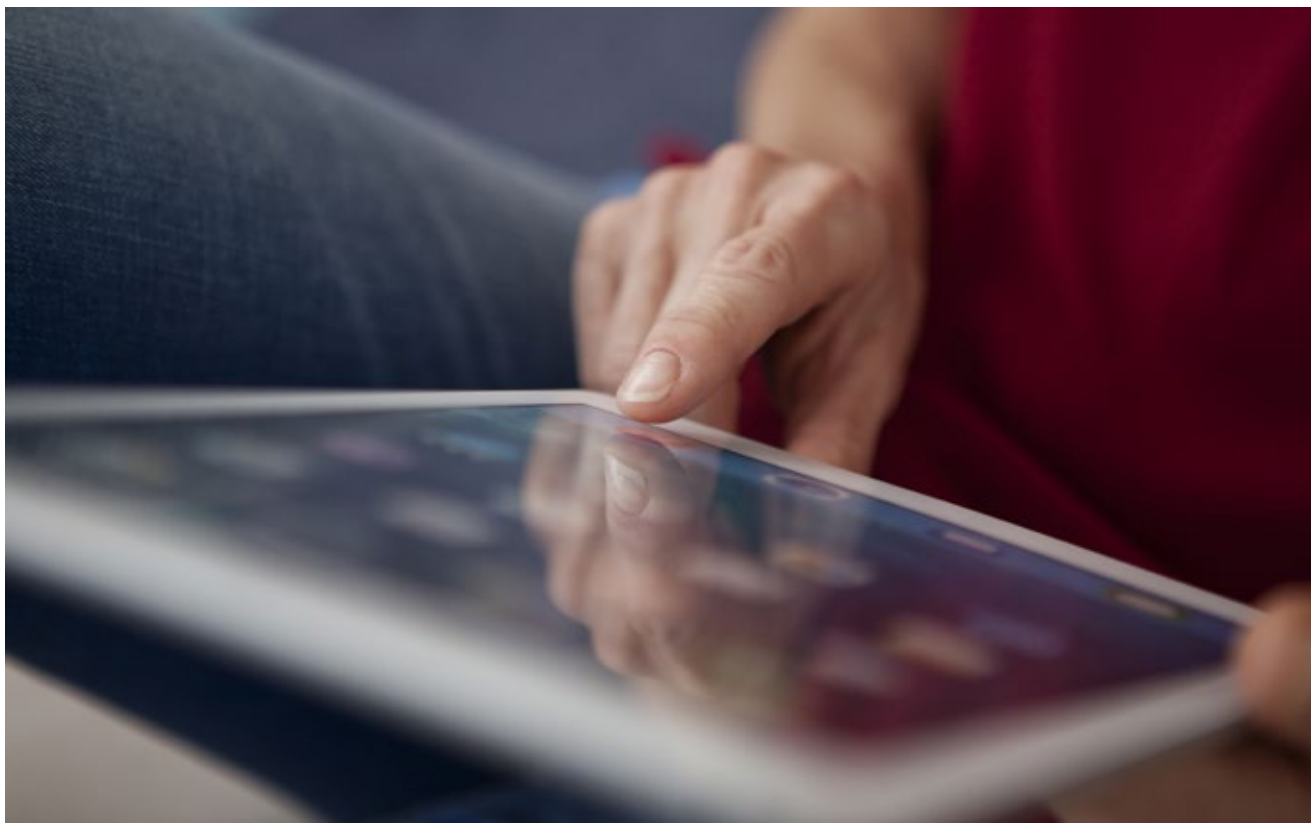
Rocky Scopelliti

Global Industry Executive
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Telstra Global Industries

1.0 EXECUTIVE SUMMARY

The spectacular growth in digital communications technology creates a huge opportunity for institutions to become more embedded in their customers' lives. But it also represents a threat. The very same technologies offer new players a way to disrupt the market either as new entrants or as enablers.

The key elements that customers require from their financial services providers are evolving. Millennials, the group aged 18 to 34, are lead indicators of these shifts, and an exploration of their attitudes is a window into the future.

Our research suggests that trust, relationship and technology is the new trinity for connecting to Millennials. Transactional competence is still critical. But the 'always-on', automated and hyper-personalised online world of the Internet and mobile devices has created a new set of expectations in the minds of Millennials. They demand speed, convenience, flexibility and customisation. The optimum trade-off between privacy and personalisation is changing daily, and institutions need to continuously balance those competing imperatives to become and remain relevant.

Paradigm-breaking technologies such as artificial intelligence, distributed ledgers, cybersecurity and digital mobility threaten to change the financial services industry beyond all recognition. In this report, we explore what's changed and what has not, and how institutions can evolve to succeed in this changing world.

In early 2016, we undertook this study across Australia, Singapore, Indonesia, Malaysia, Hong Kong, China, the United Kingdom and the United States of America. The comprehensive research involved studying the mobile financial services application behaviour of 30,000 Millennials. In a separate survey of 2,817 Millennials that were representative of the online population across seven countries, we explored in greater detail their attitudes and behaviours when it comes to financial services providers (traditional and non-traditional) and their reactions to a range of disruptive concepts relating to how they save, spend, borrow and invest.

Here are the top ten insights that we believe financial institutions need to consider:

1. Trust matters – Banks are overwhelmingly seen as the most trusted institutions

When asked which platforms (or types of organisations) they trust with personal information, 76 per cent of Millennials nominated banks. No other provider came close. This suggests the historical reputation for security and privacy – earned by the industry over generations and embodied by the traditional financial providers – has translated into the digital age. Banks are seen as a safe haven for personal information. In a world of constant threats to privacy, such a reputation is a huge asset for banks (see figure 1).

When it comes to choosing a provider for financial services, trust factors are the most important driver of choice for Millennials. Trust to them means four things:

1. **trust that finances are secured (critical for 50 per cent);**
2. **trust to keep personal data secure (critical for 49 per cent);**
3. **confidence in the security and privacy of financial interactions (critical for 47 per cent); and**
4. **reputation of the provider for data security (43 per cent).**

Despite the importance of these factors to Millennials (irrespective of the country in which they live), less than half are satisfied with the performance of their main financial services provider, paving the way for alternatives (see figure 2).

Figure 1: Trusted platform for personal information

Most trusted organisations with personal information – average rank	
1	Your bank or financial institution
2	Mobile operator/communication services provider
3	Internet retailers eg. eBay, Amazon
4	Retailers/Post Offices/Utilities
5	Online services
6	Social media networks
7	Fintech (non-traditional provider)
8	Online search eg. Google
9	Government
10	Other

Source: Telstra Research 2015 & 2016

Figure 2: Drivers of choice of financial service provider
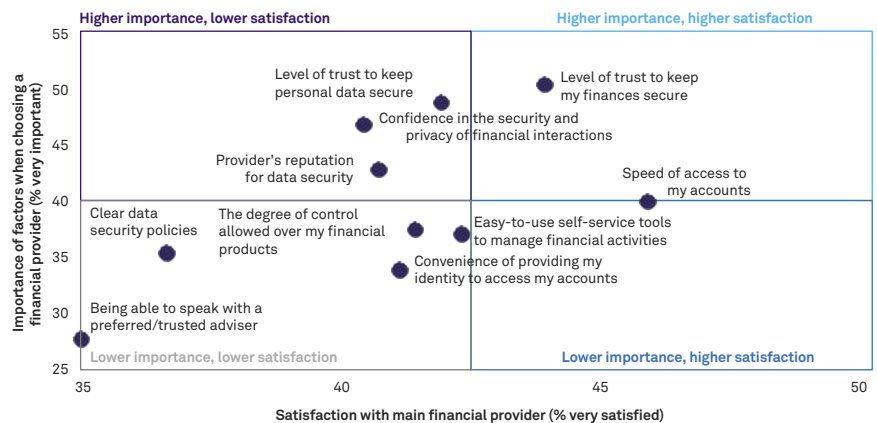
Source: Telstra Research 2015 & 2016

Banks have a massive amount of 'trust capital'. This is a major competitive advantage for the traditional financial institutions to leverage, but trust is perishable.

2. From transactional to partnership-based relationships
– From being a main financial institution to main financial app.
The relationship is available for redefinition and those that want
it desire it to be authentic

Confidentiality, privacy and security are only part of the picture. Transactional competence and operational efficiency are givens for most Millennials. They have been conditioned to expect instant fulfilment of requests; every question answered without pause and regular ground-breaking service innovations. This generation, more than any other, expects that partnerships deliver genuine value, tailored advice, support and true interoperability should be available to everyone. This is a hard expectation to meet and, indeed, many Millennials feel it is not being met. Figure 3 illustrates the gap between where they believe their relationship with their financial provider is compared with where they believe it ideally should be. Nineteen per cent of Millennials report that they are not getting the value partnership they would like.

This high proportion of value partnership seekers represents a major threat to the industry – even more so are those one in two that are neutral.

Those who want a value partnership with their provider have stronger needs for security, privacy, customisation and personalisation (see figure 4). The ability to customise/tailor offers, connect at an emotional level and automate will be strong levers that financial services providers can use for differentiation.

Figure 3: Ideal relationship with financial providers
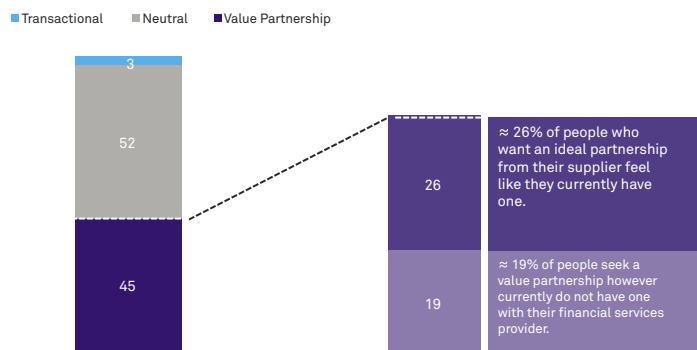
Source: Telstra Research 2016

Figure 4: Perceived relationship requirements from financial services/institutions
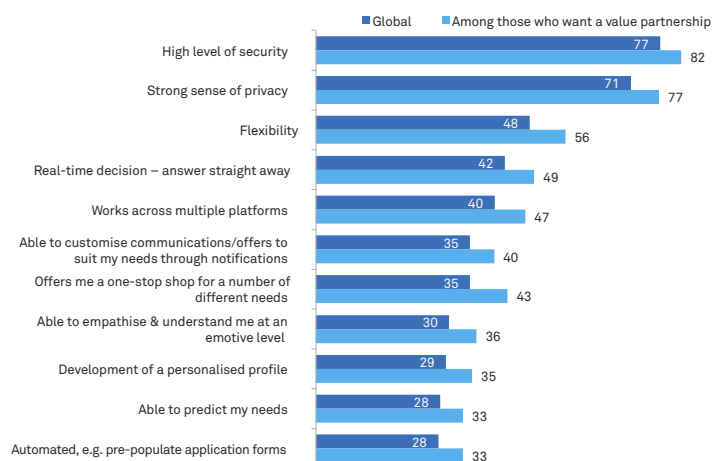
Source: Telstra Research 2016

They value relationships grounded in security, privacy, flexibility, real-time, multi-channel, customised, emotionally connected, personalised, predictive and automated – and they're open to whoever provides it.

3. Technology confluence – Their personal aspirations and their financial priorities are fused through a trusted value relationship

Technology has had an impact on financial services in exactly the same way that it has had an impact on every other aspect of Millennials' lives. This was consistent in every country we researched.

Figure 5 highlights that Millennials in the emerging markets of Indonesia and China are more reliant on technology to achieve both personal and financial goals, compared with those in the mature markets included in the study.

Apart from having slightly more conservative attitudes towards finance compared with other aspects of their lives, the way Millennials approach life tends to be aligned with their approach to finances (saving, spending, borrowing and investing) as seen in figure 6.

Figure 5: Importance of technology in achieving personal/financial priorities

- Technology is very important/important in helping me achieve my personal priorities
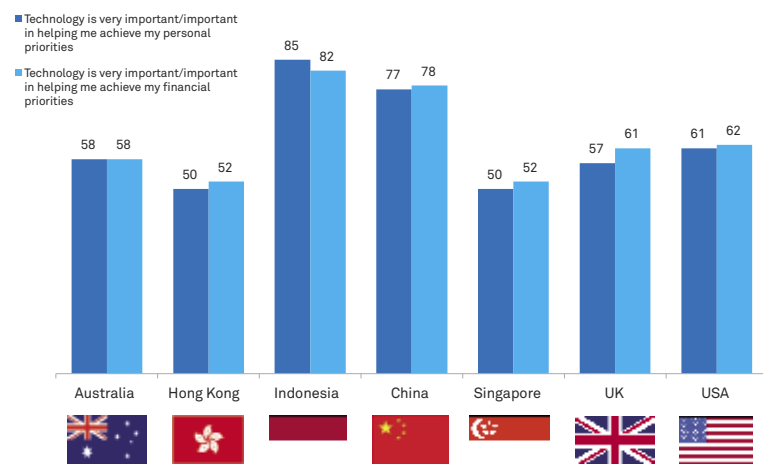- Technology is very important/important in helping me achieve my financial priorities

	Australia	Hong Kong	Indonesia	China	Singapore	UK	USA
Personal	58	50	85	77	50	57	61
Financial	58	52	82	78	52	61	62

Source: Telstra Research 2016

Figure 6: Attitudes – General priorities vs. approach to finance

	Conservative	Neutral	Risk-taker
Attitude towards life	14		32
Attitude towards finances	25		22

	Planner	Neutral	Spontaneous
Attitude towards life	31		19
Attitude towards finances	35		17

	Reflective	Neutral	Forward-focused
Attitude towards life	22		26
Attitude towards finances	20		24

	Mainstream products/services	Neutral	Customised products/services
Attitude towards life	12		26
Attitude towards finances	19		22

Source: Telstra Research 2016

Financial services are increasingly embedded in Millennials' broader lifestyles – and both are hugely driven by technology.

4. Save first, wealth later – Financial needs remain the same as those of previous generations but, technology is central to how they plan to address these

While they have grown up and now live in a world of fast-paced technological change, when it comes to their financial priorities the needs of Millennials for financial services are as strong as ever. The core needs to spend, save, borrow and invest remain unchanged.

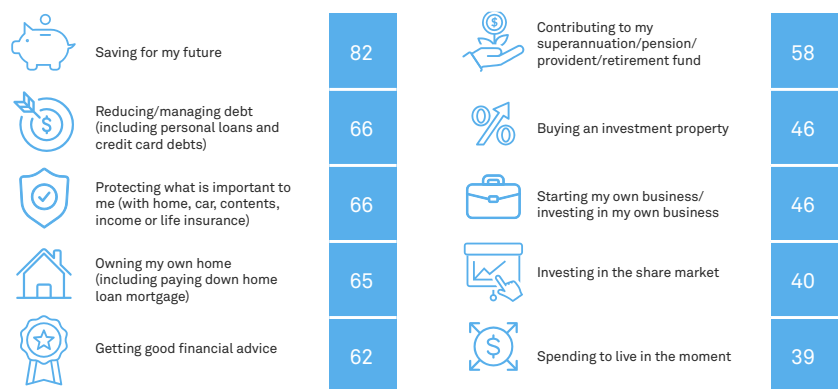Saving for their future was the primary concern (for 82 per cent), followed by debt reduction (66 per cent) and owning their own home (65 per cent). Insurance (66 per cent), getting good financial advice (62 per cent) and contributing to super (62 per cent) are also on the minds of Millennials. We also note that one in two wants to start their own business (46 per cent) as seen in figure 7. Interestingly, in many ways the Millennials we surveyed are fairly conservative – for them saving and investing is more important than spending (see figure 8).
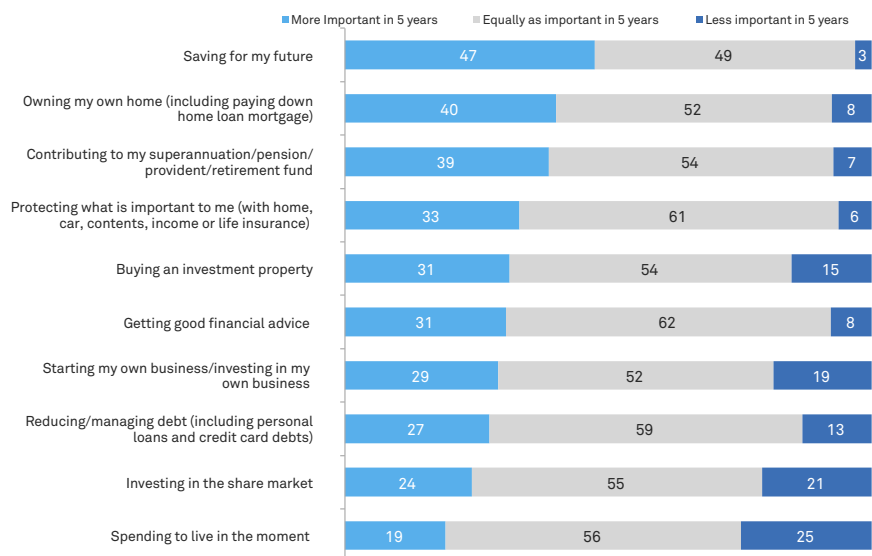
The need for financial services is as strong as ever – and is fully appreciated by Millennials.

Figure 7: Importance of planning for financial future this year

Saving for my future	82	
Reducing/managing debt (including personal loans and credit card debts)	66	
Protecting what is important to me (with home, car, contents, income or life insurance)	66	
Owning my own home (including paying down home loan mortgage)	65	
Getting good financial advice	62	
Contributing to my superannuation/pension/provident/retirement fund	58	
Buying an investment property	46	
Starting my own business/investing in my own business	46	
Investing in the share market	40	
Spending to live in the moment	39	

Source: Telstra Research 2016

Figure 8: Perceived requirements from financial services/institutions

Legend: ■ More Important in 5 years ■ Equally as important in 5 years ■ Less important in 5 years

	More Important in 5 years	Equally as important in 5 years	Less important in 5 years
Saving for my future	47	49	3
Owning my own home (including paying down home loan mortgage)	40	52	8
Contributing to my superannuation/pension/provident/retirement fund	39	54	7
Protecting what is important to me (with home, car, contents, income or life insurance)	33	61	6
Buying an investment property	31	54	15
Getting good financial advice	31	62	8
Starting my own business/investing in my own business	29	52	19
Reducing/managing debt (including personal loans and credit card debts)	27	59	13
Investing in the share market	24	55	21
Spending to live in the moment	19	56	25

Source: Telstra Research 2016

However, the way Millennials plan to meet their financial needs may have fundamentally changed. When searching for information regarding these core needs, mobile apps are heavily used, particularly by males (see figure 9). Millennial Savers are those who are more likely to save money through recognised applications and Millennial Spenders are those more likely to spend money on various leisure activities.

Figure 9: Mobile app search – Average across all countries
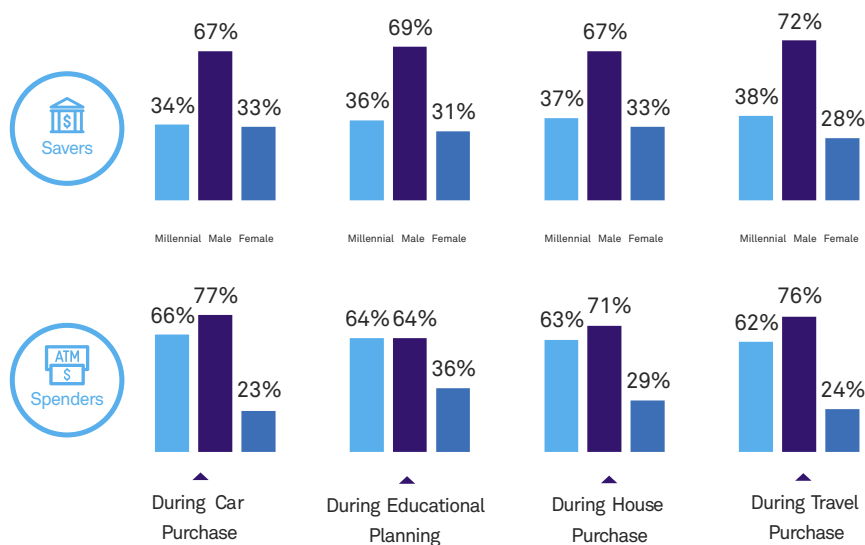
Source: Near Research 2016

Spending comes before saving – From the study, it is evident that across all geographies, Millennials are great 'Spenders'. The 'Spender' to 'Saver' ratio among the Millennials is 2:1. Millennial 'Savers' are usually seen on their mobiles during late evenings. Insights such as commonly active times of the day and repeat browsing patterns on mobile can help guide strategies to maximise reach and engagement. They can also be used to lead customers from simple transactional behaviour to the more consultative and higher value wealth-creation saving services.

Males research and plan to spend and save – Among Millennials in both the 'Savers' and 'Spenders' categories, males dominate. Across all geographies, males exhibited more extensive mobile research behaviour prior to a financial decision than females. Their mobile behaviour suggests they plan as they save and they plan as they spend. Planning and research is prominent behaviour among Millennials, therefore customising or personalising information services is a key strategy to engaging them.
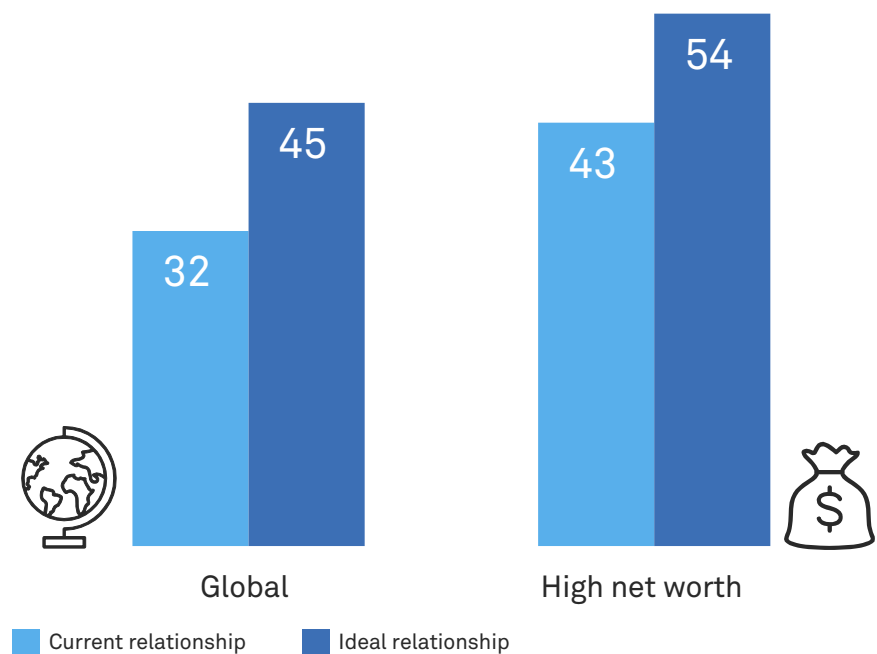
2:1 ratio
'Spenders' to 'Savers' ratio **among Millennials**

Male
Across geographies, **males dominated** in 'savers' and 'spenders'

5. Mind the relationship gap – Most don't feel the relationship is currently ideal and as their affluence increases, so too does the gap increasing risk of defection

Not surprisingly, affluent Millennials are the most demanding – they are seeking a true value partnership with their financial services provider and less than half (43 per cent) believe they are receiving one (see figure 10).

The implication for traditional financial services institutions is that their most valuable Millennial customers are at risk. Fintechs that can offer what is perceived as better value could be poised to steal the relationship.

Figure 10: Current and ideal relationship with financial provider

Global	High net worth

Current: 32 / Ideal: 45 (Global)
Current: 43 / Ideal: 54 (High net worth)

■ Current relationship   ■ Ideal relationship

Source: Telstra Research 2016

Delivering to their aspirations and retaining them will need to be anchored on the relationship.

6. Do-it-yourself digital advice – This is preferred and more valued, particularly by affluent Millennials. A third prefer Siri or Google for advice, rather than a finance professional

Two thirds (67 per cent) of Millennials prefer to receive advice on financial products and services via a digital platform. This figure was even higher for affluent Millennials (70 per cent), as shown in table 1. This finding has significant consequences for the traditional banking industry as much of their advice infrastructure (which they see as a source of advantage over non-traditional financial service businesses) is less relevant to the majority of Millennials. Millennials are comfortable receiving advice from digital platforms – and mobile platforms in particular.

Table 1: Preferred delivery platform for financial advice on products and services

How do you prefer to receive financial advice?

	All %	HNWs % ($500k-$1m+)
Digital (e.g. technology generated by completing details online or through apps)	67	70
More traditional platforms (e.g. in person from bank manager, insurance provider, financial adviser)	33	30

Source: Telstra Research 2016

The single biggest reason for preferring digital advice is a perception of greater independence, followed by an expectation of a faster response.

More than half the affluent Millennials we spoke to saw digital financial advice as more independent than that given by human financial advisers.
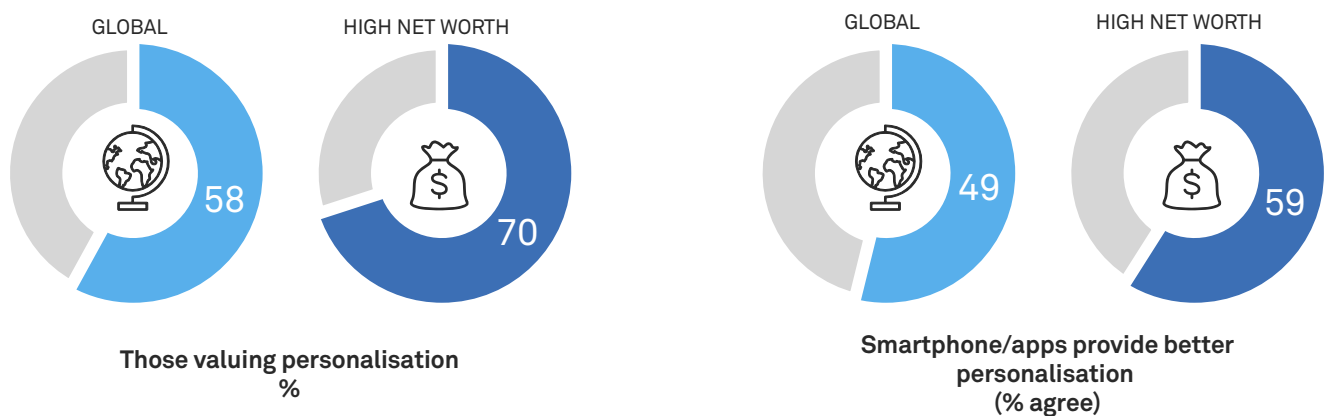
Automated robo/digital financial advice is perceived to be independent and preferred, and a real threat to traditional advice models.

7. Bespoke banking makes digital personal – Personalisation is valued and expected through smartphone apps

Personalisation is valued by Millennials, particularly the affluent. Half of the respondents (and more in the affluent category) prefer this advice to come via their smartphones (see figure 11).

Figure 11: Importance of personalised financial services

GLOBAL	HIGH NET WORTH
58	70

Those valuing personalisation %

GLOBAL	HIGH NET WORTH
49	59

Smartphone/apps provide better personalisation (% agree)

Source: Telstra Research 2016

We have seen that Millennials have the same financial services needs as other generations. Moreover, there's no question that they retain an enormous level of trust in traditional banks.

However, this generation has grown up in a world of technology that puts them at the centre of everything. They see the world of finance as being closely woven into the everyday fabric of their lives, and mobile technology is the enabler and driver of both.

Mobile is the platform to create a personalised relationship - The average time spent on mobile by the general population is 2.4 hours per day. However, Millennials spend on average 2.9 hours on mobiles – one and a half times more than all the generations combined (highest is in Malaysia and Singapore – see figure 12). With advancements in digital technology, increasing affinity with personal mobile devices and the higher proportion of Millennials opting for mobile services, it would seem logical for financial institutions to choose mobile as a preferred medium to target Millennials.
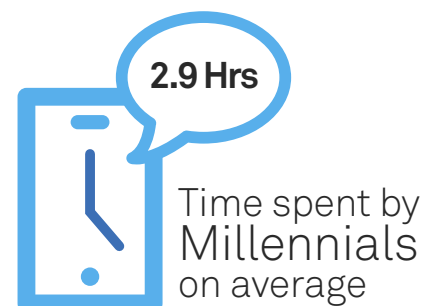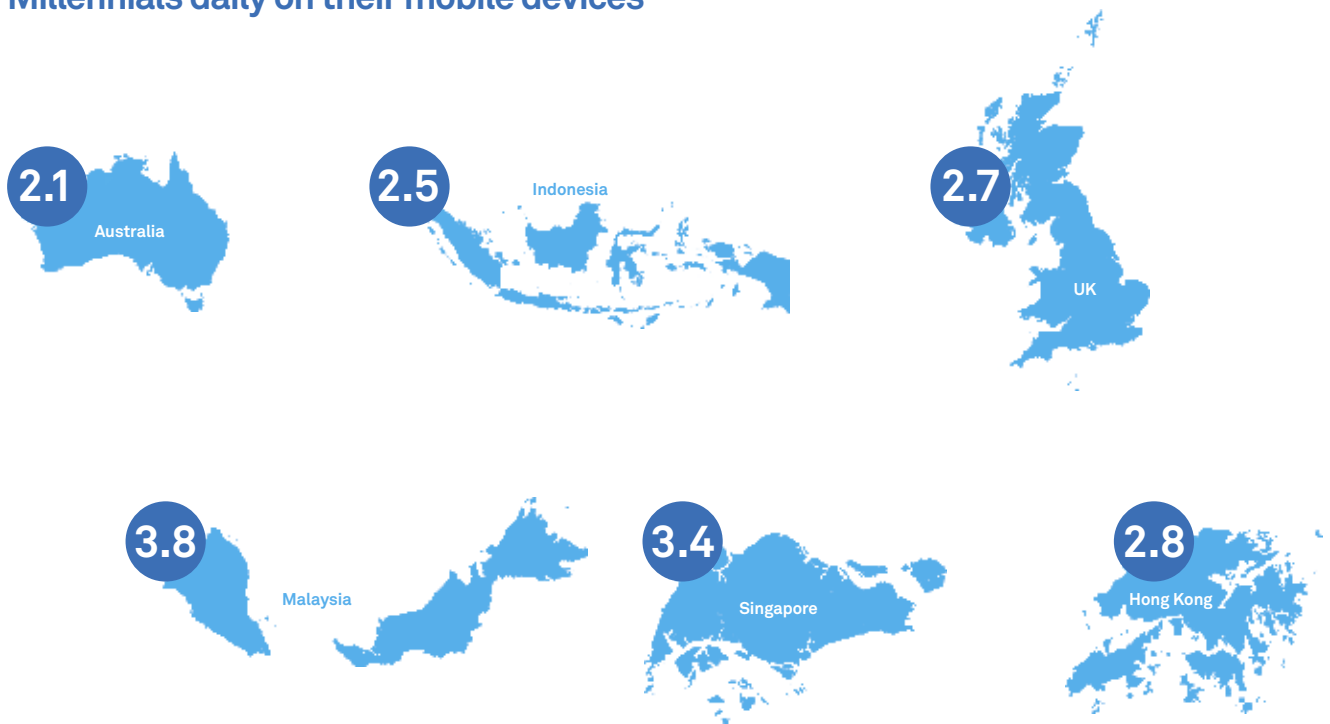
2.9 Hrs

Time spent by Millennials on average

Figure 12: Average number of hours spent by Millennials daily on their mobile devices

2.1 Australia

2.5 Indonesia

2.7 UK

3.8 Malaysia

3.4 Singapore

2.8 Hong Kong

Source: Near Research 2016

Millennials believe in using digital technology that can be customised according to their needs. Location intelligence and mobile application analytics are two of the technologies that can provide financial institutions with the insights they need to create personalised services. Both technologies have the potential to help institutions build a strong customer relationship with Millennials and deliver better consumer experiences.

In every country we covered, the Millennials surveyed expected and demanded a value relationship with their finance provider – rather than a simple transactional one. That value relationship means fast, independent, personalised advice and service. It does not necessarily require branches, call centres or even human advisers.

Affluent Millennials are the most at risk of seeking greener pastures. Apps are the personalised gateway to a valued relationship.

1.0 EXECUTIVE SUMMARY (CONT.)

8. Fintech tasting (with many feasting) – Millennials are using or considering using non-traditional providers - and the affluent ones have the greatest appetites

The threat from fintech is significant. One in two Millennials are currently using or would consider using a non-traditional provider. Among affluent Millennials, this figure rises to seven in ten (see figure 13).

Figure 13: Use of non-traditional providers

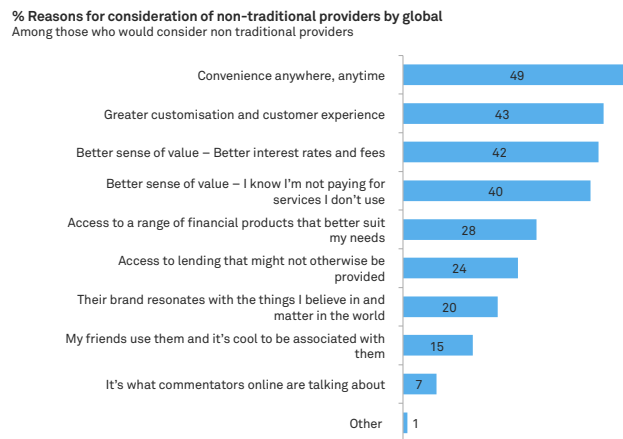**Currently using or would consider a non-traditional provider for financial services (%)**
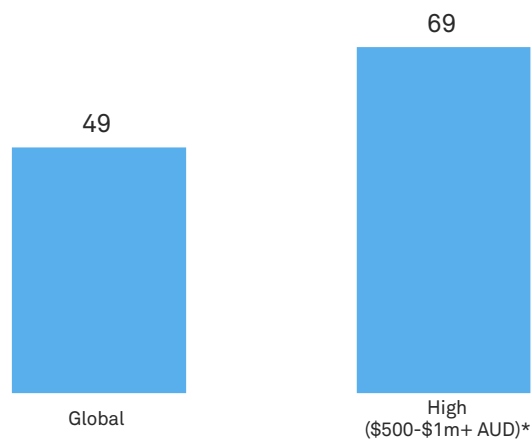
Source: Telstra Research 2016

The scale of demand for non-traditional providers is very significant.

9. The convenience customer – Convenience, customisation and value are the key reasons why Millennials consider using fintechs

Technology inflates Millennials' expectations. Millennials report that convenience, customisation and value rather than branding are the primary drivers for using non-traditional providers (see figure 14). Customisation and value are most important for affluent Millennials (see table 2).

Figure 14: Reasons for consideration of non-traditional providers

% Reasons for consideration of non-traditional providers by global
Among those who would consider non traditional providers

Reason	%
Convenience anywhere, anytime	49
Greater customisation and customer experience	43
Better sense of value – Better interest rates and fees	42
Better sense of value – I know I'm not paying for services I don't use	40
Access to a range of financial products that better suit my needs	28
Access to lending that might not otherwise be provided	24
Their brand resonates with the things I believe in and matter in the world	20
My friends use them and it's cool to be associated with them	15
It's what commentators online are talking about	7
Other	1

Source: Telstra Research 2016

Table 2: Reasons for consideration of non-traditional providers – by customer net worth

% Reasons for consideration of non-traditional providers by net worth

	Global	Low ($0-$500k AUD)*	High ($500-$1m+ AUD)*
Convenience anywhere, anytime	49	49	49
Greater customisation and customer experience	43	39	51
Better sense of value – Better interest rates and fees	42	38	48
Better sense of value – I know I'm not paying for services I don't use	40	37	45
Access to a range of financial products that better suit my needs	28	26	32
Access to lending that might not otherwise be provided	24	23	28
Their brand resonates with the things I believe in and matter in the world	20	18	23
My friends use them and it's cool to be associated with them	15	14	17
It's what commentators online are talking about	7	6	9
Other	1	1	1

There is comfort for traditional providers here. The demand for alternative providers is not being driven by some desire to radically change paradigms or to sweep away outdated models. Rather, it is a demand that traditional financial services institutions catch up with the rest of the Millennials' world that they offer Millennials a better experience and better value equation.

While the consideration of alternative providers is alarming, the unmet needs are not insurmountable – particularly in light of the huge trust asset held by traditional institutions.

Affluent Millennials desire customisation more than the average and are driven by customisation slightly more than convenience.

10. Removing information asymmetry friction and making personal data portable – This empowers Millennials' digital lives and unlocks disruption

To unpack this desire for real-time customisation, personalisation and convenience, we explored four disruptive service concepts. Each of the concepts removes the friction of information asymmetry in the experience and empowers Millennials through control of their personal data when used through mobile apps while they make highly significant financial decisions.

Concept A	**Lending (Loan)** Imagine you are in the market for a car, holiday or some other expensive item and for whatever reason you need to finance it. Thinking about a new car as an example, you are at the car dealer and have found a new car you like, you pull out your phone and connect to an app where companies and individuals bid to offer you the best finance deal. You review the offers to find the best one for your needs, check the ratings and reviews from other members of the digital community, you accept the best offer, the financing is processed digitally in real-time and the dealer receives confirmation of finance and you can walk away with the car.
Concept B	**Lending (Mortgage)** Imagine that you want to buy a home and need a home loan. Rather than gathering lots of paperwork and going to see your bank to get their approval (which could take weeks), imagine if you could just click on an app and add key pieces of information about yourself/partner (to determine your ability to repay in the future) and be connected to a range of lenders (banks, credit unions, individuals). The lenders compete for your business based on the loan details (rates, fees, loan terms). You review the offers in addition to ratings and reviews that other members of the online community have given the lender and make your selection through the app. You upload proof of income and savings history documents and in a matter of minutes have the finance so you can buy.
Concept C	**Saving** You are saving-up your money for a big purchase – car, holiday, house, etc. You want to get the best return on your money so you can get there sooner and might want the flexibility to access your money when you need it. You click on app where a range of financial institutions, businesses and individuals compete to manage your savings with the best offer. You check the community ratings, make your choice and digitally transfer your funds. When you need your money you access the app and transfer it to your traditional bank account including the interest.
Concept D	**Investing** You are accumulating wealth for your future or your retirement. You might have a mix of shares, property, cash, superannuation/pension. You click onto the app to access a huge range of wealth and investment managers from around the world who can help you access all types of investments. You enter your risk preferences and any asset allocation preferences you might have plus your wealth goals. The wealth managers compete by offering you a range of alternatives at different expected yields. You review past and projects returns plus community reviews. When you have considered the options and are ready you transfer your assets across digitally and use the app to monitor your investments.

These four concepts challenge the core activities of the financial services industry. They can be seen as substitutes, rather than competitors. Each of them delivers on the desires of Millennials' for mobility, convenience and speed. However, in doing so, they require financial institutions to change their thinking. The traditional focus areas–risk assessment, underwriting and payments infrastructure–become less important than speed, agility and user experience. Equally, investments in marketing, communications and relationship-building may be superseded by an ability (and a willingness) to compete in real time and on a level playing field with other providers.

The new concepts appeal to Millennials. In fact, around three out of five Millennials were attracted to at least one of the offers (see table 3).

Table 3: New concept appeal

Appeal of concept	A. Lending (Loan)	B. Lending (Mortgage)	C. Saving	D. Investing
Extremely/Somewhat appealing %	62	64	63	56

Source: Telstra Research 2016

This presents a threat to the traditional models of service provision, but not necessarily to traditional institutions. Millennials are clear that these concepts could be delivered equally well by either existing players or non-traditional providers (see figure 15).

Figure 15: Preference for concept service provision

Who would you consider to deliver new concepts in FS (%)

Don't have a preference

?

36

44 Traditional Financial Institute

20 Non-Traditional Provider
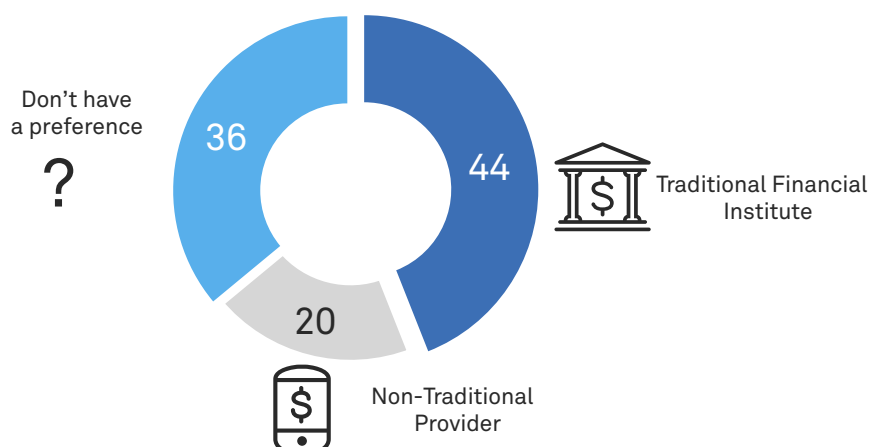
Source: Telstra Research 2016

Millennials' desires to control their digital lives (and personal data) and their appetite for innovative, real-time service offers present risks to existing business models, as they're open to whoever provides them.

SUMMARY

Investors can clearly see the appetite Millennials have for new ways to save, spend, borrow and invest. Fintechs targeting Millennials have already attracted US$3.7 billion in funding, with one in two targeting savings and spending (Millennials' top priorities) and one in three targeting investing/wealth management (Millennials' longer-term priorities).

The challenge now is determining how best to innovate and build platforms that support innovation through speed of delivery, the ability to scale rapidly and the ability to deliver functionality with extreme agility (while simultaneously managing an increasing array of cybersecurity threats). A new generation of digital platforms and services is enabling institutions to meet these challenges (see 'Anatomy for next generation, distributed, autonomous digital financial services'):

- **Next-generation cloud networks** that can be reconfigured in real-time by applications to dynamically provide the features and access they require;

- **Next-generation analytical platforms** that provide the broader business with access to data and tools that provide real-time new insights into the customer and then turn them into operational actions;

- **Next-generation security and identity platforms** that are designed from the ground up to protect highly distributed, composite services, that limit personal data disclosure and can evolve to address new and emerging threats for both Millennials and institutions, and;

- **Next-generation digital platforms** that reduce the cost, time and complexity of building, deploying and maintaining applications. These platforms also allow institutions to expose data and services to ecosystem partners in a manageable and highly usable way.

Diagram 1: Anatomy for next generation, distributed, autonomous digital financial services
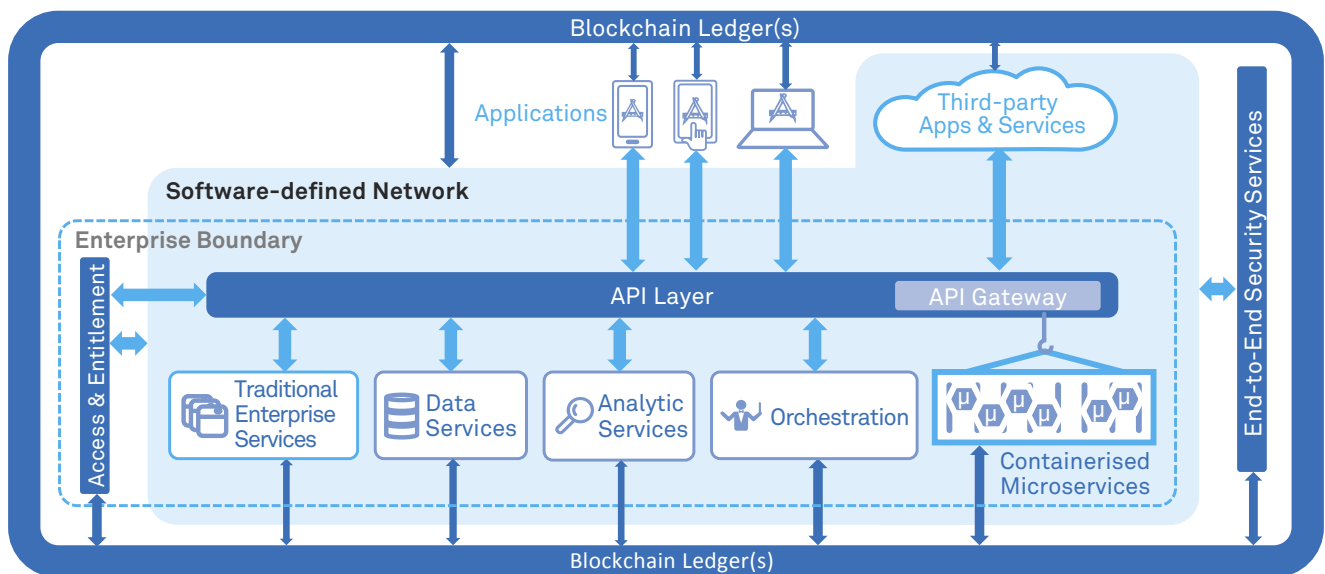
Source: Telstra Research 2016

Millennials only see one application provider fulfilling their lifestyle processes. Behind the scenes a wide variety of financial, social, technical and analytical services are orchestrated in real time. Software-defined Networks (SDN) ensure security and user quality experience, and distributed Blockchain Ledgers ensure the integrity of data and services.

This Millennial research delivers a stark message to traditional financial services institutions. Trust, security and data expertise are vital prerequisites for today's digital, mobile technology world. However, these attributes are not unique to institutions (although they are over overwhelmingly associated with banks), and they are not enough to guarantee success. The Millennial generation demands innovation – new solutions that deliver greater convenience, value and personalisation in a

world characterised by 'personal data portability'. Institutions have permission from Millennials to offer this innovation. The question is whether traditional institutions have the skills and the capabilities required and the willingness to adapt. One possible option is partnership, where the solid, trustworthy brand and critical assets of the traditional player complement the innovation and agility of the non-traditional fintech. If the right match can be made, the rewards are potentially enormous.

2.0 FIVE MEGA TRENDS IMPACTING FINANCIAL SERVICES

"Any one of the six innovation clusters has major implications for incumbents and their customers, and for the overall financial services ecosystem. Benefits of scale will erode. The universal banking model is becoming unbundled. New sources of capital are appearing. The disruption is being felt first in banking, with the hardest impact in insurance hot on its heels. Old ways of measuring risk just won't work anymore."

Katherine Milesi – Partner, Deloitte Digital and Board Member, Deloitte Australia and Joel Lipman – Partner, Financial Services Innovation Leader, Deloitte

We've seen from the research in the executive summary that Millennials seek more value from their relationships with their financial service providers. We've also seen that their personal aspirations and financial priorities are fused by technologies that enable customisation and personalisation, and deliver perceived value. Let's now take a look at innovation in financial services.

As we respond to the convergence of financial services, lifestyle services and digital technologies, to the realities of delivering great customer experiences it's becoming increasingly difficult to both navigate uncertain markets as we pitch for the future and need to keep delivering the present.

That makes the research on the Future of Financial Services from Deloitte and the World Economic Forum[19] so useful.

By combining their analytic smarts with deep, iterative global research, they have built a comprehensive and contemporary taxonomy of disruption in financial services. It is focused on how rapid technological change is reshaping traditional definitions of value. And despite many 'unknown, unknowns', the research finds that innovation in financial services is both deliberate and predictable.

2.1 Five mega trends

The megatrends are:

1. Innovation occurs in **clusters**, despite often appearing to be isolated;

2. The business models with the greatest disruptive impact are **platform based**, **data intensive** and **capital light**;

3. Innovation occurs where real **customer friction** meets large **profit pools**;

4. Incumbent institutions employ **parallel strategies** to manage disruption. They aggressively **compete with new entrants** as well as leverage legacy assets to provide new entrants with **infrastructure** and **access to services**; and

5. Disruption is not a one-time event. A **continuous pressure to innovate** is shaping customer behaviours, business models, and the long-term structure of the financial services industry.

Deloitte and the World Economic Forum also found that – in order to understand how new innovations are altering the risk profile of the industry – collaboration between regulators, incumbents and new entrants, is critical. The reality is that the disruptions tearing down the barriers to entry that once seemed impenetrable are now challenging the business models of incumbent institutions.

2.2 Functions of financial services and innovation clusters

The research is structured around the six core functions of financial services and identified eleven clusters of innovation (see figure 16).

Figure 16: Taxonomy for disruptive innovation in financial services
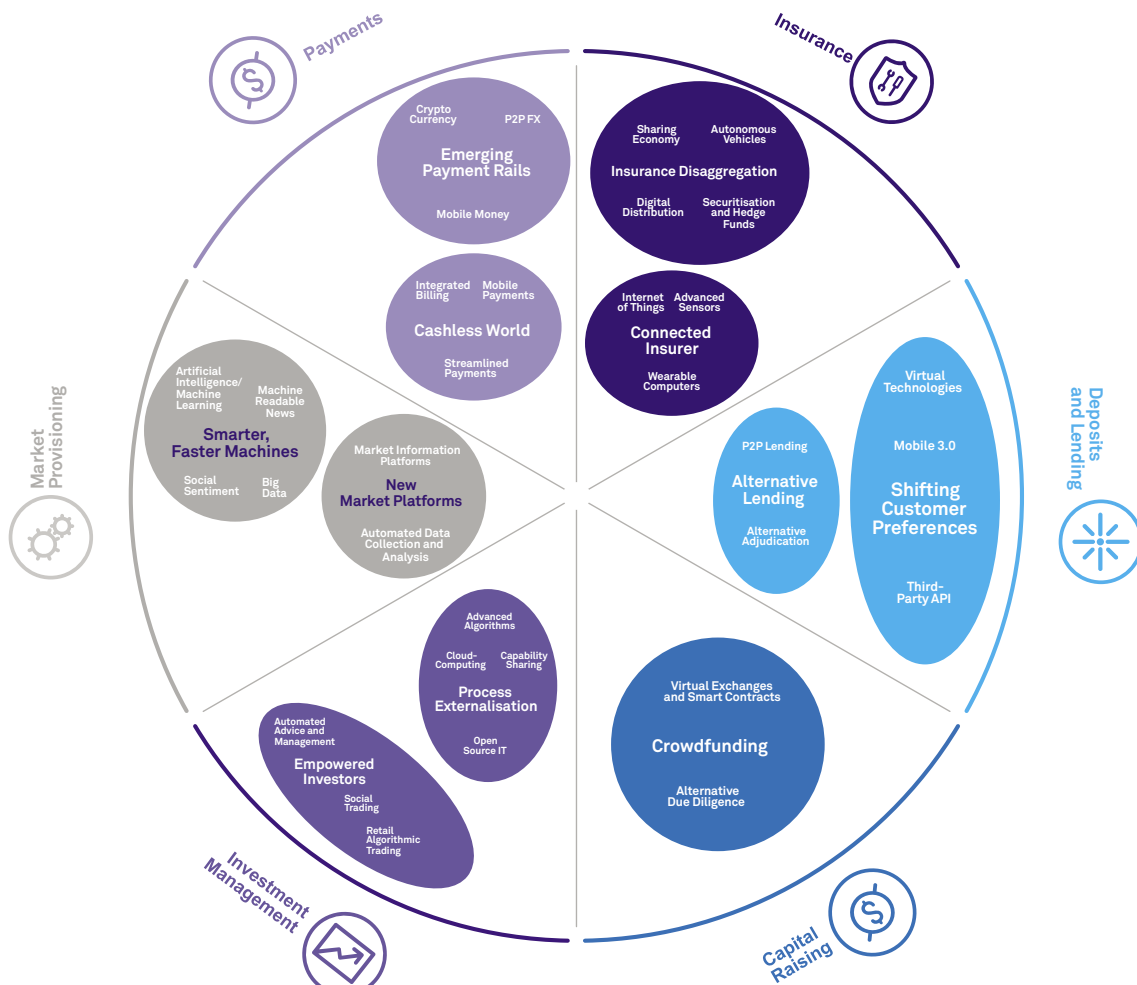
Source: Deloitte 2015

2.3 Financial services impact – innovations, key disruptions, pressure points and the prize by cluster

Below are the key pressure points for each of the 11 innovation clusters and the 'prize-drivers' for each of the core six functions of financial services.

Functions	Innovations, key disruptions and pressure points by cluster						
Payments	**Cashless World**				**Emerging Payment Rails**		
	Mobile payments	Streamlined payments	Integrated billing	Next-gen security	Cryptographic protocols	P2P transfers	Mobile money
Pressure Points	• Mobility and connectivity make a cashless world real • Issuers are challenged to differentiate as branding declines • Streamlining pushes transactions to a single default card • Retail banks will need to replace credit card profit • Digital wallet services and integrated billing mean financial institutions must rethink their interactions with customers				• Banks and stock exchanges consider Blockchain-based open or permissioned distributed ledgers for settlement, currency and remittance exchange, reducing back office costs, risk and friction • For regulators the balance is pace of change vs. security/control • For financial institutions investing in data sharing and boosting merchant partners is key, while navigating uncertainty and consistency of purpose • The appetite for P2P transfers also challenges the status quo		
The Prize	Minimised friction and cost; increased speed and transparency; and greater access to valuable customer data on lifestyle choices						
Market Provisioning	**Smarter, Faster Machines**			**New Market Platforms**			
	Machine accessible data	AI/machine learning	Big data	Fixed income	Funds/ funds of funds	P.E./VC shares	Private company shares	Commodities and derivatives
Pressure Points	• Algorithmic trading incorporating real-world data, news and social media feeds, will automate manual activities, heralding radical changes for the current workforce • With end-to-end trading activities automated, a small error in data integrity and execution will have a big impact, just like the 'White House explosions' tweet wiped $136 billion from the S&P 500 in 2015 • Machine learning and artificial intelligence are likely to tighten the gap between large players and small, and their intermediaries			• As new information platforms improve connectivity for markets, making them more liquid, accessible and efficient, incumbents will need to build different market specialisations and services • As platforms and decentralised technologies aggregate and analyse information, institutions will need to make significant ongoing investment to maintain market advantage • As services become commoditised, the shift to providing trusted advice, which is likely to be the new currency, will need to happen			
The Prize	Increased speed, efficiency and accessibility; greater sophistication and competition; more quantifiable and comparable metrics						

Investment Management	Empowered Investors			Process Externalisation			
	Social trading	Automated advice and wealth management	Retail algorithmic trading	Advanced analytics	Natural language	Process as a service	Capability sharing
Pressure Points	• As robo-advisors create sophisticated financial management offers, margin pressures tighten, pushing down incumbents' profits • Wealth managers will have to revamp their value propositions to stay relevant and turn up services to the high net-worth set • Social trading platforms that let individuals share and trade their expertise can and will place traditional reputations on the line • Investors even with limited technical ability, can easily build, test and execute trading algorithms			• Automated processes mean more entrants can use low-cost infrastructures, reducing the competitive advantage of scale • As customers turn to self-management fewer wealth products will be sold through proprietary advisory channels • Advanced analytics return tailored customers' finance positions and recommendations at a fraction of former costs and speeds • Customer interaction and service delivery will increasingly take place on demand via online and mobile channels			
The Prize	Better access to mass affluent and mass market customers; transparency and cost effectiveness; personalisation and convenience						
Insurance	Insurance Disaggregation				Connected Insurance		
	Disaggregated distribution	Sharing economy	Self-driving cars	Third-party capital	Smarter, cheaper sensors	Wearables	IOT/Internet of things	Standardised platforms
Pressure Points	• Active management around an insured's risks will put pressure on current channels like brokers, and insurers will need new skills for direct interaction • The dynamics will alter as insurers will need insurees' trust, not vice versa • Self-driving cars will change motor insurance cash cows pressurising profits • The sharing economy blurs boundaries, letting customers be suppliers and everyone able to share their expertise regardless of ability or experience				• The devices that connect cars, people and homes are the web that brings the telematics insurance model, and challenges traditional providers • When policies and premiums are personalised, the current model of cross-subsidisation across customers will no longer be feasible • As old competencies commoditise, attractive new competitors can poach formerly sticky customers with empowering and powerful experiences			
The Prize	More accurate, iterative risk profiles; personalised and event protection; broader cost effective eco-systems for healthier, happier clients							

2.0 FIVE MEGA TRENDS IMPACTING FINANCIAL SERVICES (CONT.)

Deposits and Lending	Alternative Lending			Shifting Customer Preferences		
	P2P	Lean automated processes	Alternative adjudication	Virtual banking 2.0	Banking as platform API	Evolution of mobile banking
Pressure Points	• Alternative offerings are flipping lending propositions – unbundling traditional services and empowering borrowers to accept or reject lenders' best offers • Intensified competition is narrowing the spread between deposits and loans, decreasing financial institutions' profitability • P2P and alternative offerings challenge financial services' legacies as the end-to-end owners of the customer experience; new relationships need developing • Evolving channels and services raise risk and compliance issues for ADIs, slowing market delivery and creating missed opportunities • Distributed customers' credit portfolios across multiple platforms will transform credit evaluation, making measuring customer's creditworthiness difficult			• Non-traditional players' convenient, iterative mobile offerings threaten existing financial services' customer relationships as well as distribution • Application programming interfaces (APIs) are create banking as a platform, broadening market reach, and demanding a sharper competitive edge from all • Light virtual financial institutions specialising in account management can offer the full suite of financial products by partnering with niche alternative providers • Financial institutions will need to choose their specialties and where to leverage external partners (e.g. product manufacturing vs. creating customer experience) • Unfamiliar, ambiguous, volatile market complexity requires flexible, innovative, sophisticated cultures and comfort with continuous change		
The Prize	Competitive, customised services; new alliances/partnerships; simplification and growth; potentially stronger customer relationships					
Capital raising	Crowd Funding					
	Empowered angel investors			Alternative adjudication		
Pressure Points	• The rapid rise in start-ups and business ventures needs increased investment • The maturing of angel investors is putting more pressure on current margins • Distributed platforms compete with traditional intermediaries for investments • Need to consider value that isn't directly tied to financing			• As barriers to entry fall, accessible crowd-funding suggests lenders will need to compete against alternative platforms for a share of their current markets • As choices change opportunities and appetites, customers are challenging their traditional product offerings and services mix • Regulatory requirements are not yet global – alternative due diligence abounds		
The Prize	Increased access to capital raisings; flexible, larger ecosystems; more efficient, speedier early funding; revamped concepts of value					

Smarter, faster, more cost-effective, convenient, customised and personalised – we aspire to create and deliver such services. Our power cohort, the Millennials, demand it. Digital technology (increasingly mobile) has blurred the boundaries of industry sectors, blurred the definition of who actually provides a service, and has turned the tables on providers and buyers. One constant, however, is the heightened expectations of tech-savvy customers sporting a greater propensity to 'just walk away' than ever before – even more so as their net worth increases.

We know that disruption is no one-off event, but rather a continuous pressure to meet customer aspirations, build new business models, and reframe financial services. The World Economic Forum/Deloitte consolidated framework will help us to better understand these disruptive clusters of innovation around the core functions of financial services. As we continue to explore the demand for change globally and how it is shaping markets and ecosystems, we also know that innovative disruption is most likely where customer friction butts up against large profit pools.

3.0 THE MOBILE MILLENNIAL RESEARCH

So far, we've determined that 'trust, relationship and technology' is the new trinity to bring to Millennials. Their expectations are focused on convenience, customisation, personalisation and value – especially as their net worth increases. Having considered the five mega trends shaping innovation across the financial services industry, and noting the clusters coalescing around these trends, let us now meet the disruptors. We'll take a deep dive into understanding the mobile app behaviour of Millennials, and then gauge their reaction and preferences to a range of disruptive app-delivered experiences that equip them to navigate common and priority life-stage events.

3.1 Millennials – both 'Savers' and 'Spenders'

In this section we explore insights into the digital mobile behaviour of Millennials. As with other generations, the behaviour of Millennials isn't homogenous due to the size of the age range (18 to 34 years) and the multiple life stages typically found within that demographic. However, general insights can be observed.

With their employment, spending power and wealth (through inter-generational transfer) increasing by the day, they are considered to be among the quickest decision makers. Millennials' dependence on mobile devices is also rapidly increasing, often through the use of social media and entertainment/lifestyle based applications.

Mobiles play an influential role in the way in which Millennials make day-to-day decisions and Millennials will influence the ways in which other generations make decisions. Therefore, value can be gained by targeting Millennials on mobile that cannot be captured by targeting them on any other platform. This is one of the reasons why location intelligence and mobile application analytics can play a critical role in the design, creation and delivery of personalised service experiences – leading to the deeper relationship Millennials desire with their financial service providers.

In the following section 3.1, we use those technologies to investigate the following questions:

- How much time do Millennials spend on mobile devices?

- What percentage of Millennials are 'Savers' (engaging saving-related apps) and 'Spenders' (engaging spending-related apps)?

- What time of the day are Millennials active on financial services applications?

- What percentage of Millennial 'Savers' and 'Spenders' are males/females?

- How many times do Millennials use financial applications daily for decision-making purposes?

- And most importantly, how can institutions exploit these insights?

3.0 THE MOBILE MILLENNIAL RESEARCH (CONT.)

This study provides insights into the behaviour of Millennials in the digital mobile world. It will help show financial institutions how to use mobile analytics to design and execute their specific personalisation strategies. Let's begin by looking at the technology.

In 2014, Telstra Ventures made an investment in Near, a leading location intelligence platform. Near provides real-time information on places, people and products. The platform fuses various data including proprietary location data, app data, navigation data, telco data, geographic data, demographic data and various third-party data.

The platform is currently being used to generate consumer insights, enhance business operations, targeted marketing, attribution measurement, and for broader business and marketing intelligence.

Refined Location Data

Behavioural data

Interest data

Demographics data

Third-party data
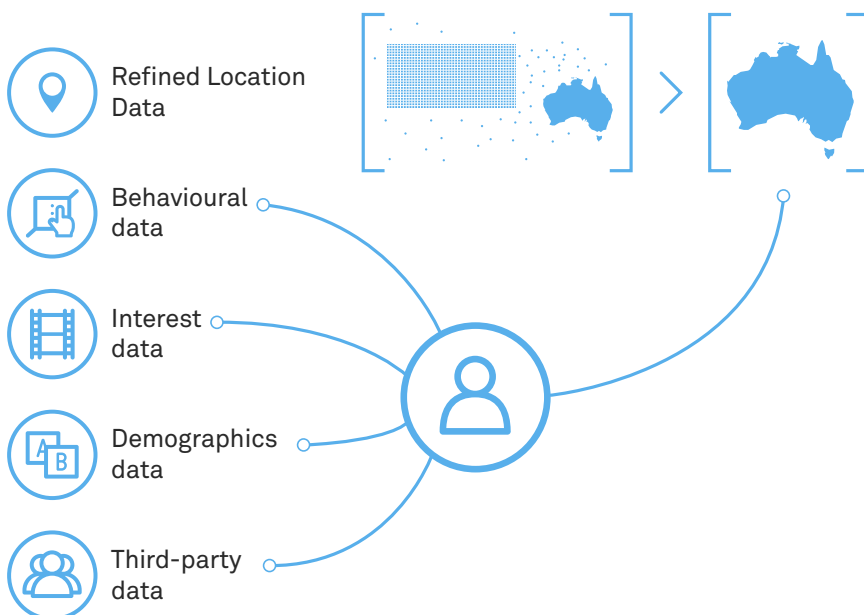
Institutions can use the Near platform to create a custom audience by defining rules that could vary by real-world location footprints, consumer interests, visit frequency around a particular location and geo demographic attributes. This audience can be studied further to derive insights, create real-time actions from them, and to measure the impact of the targeting. Institutions can also integrate their own data with Near's to create a private audience cloud for customised business intelligence. Let's now take a look at the insights generated from Millennials and financial services

3.2 Methodology – Millennial mobile application behaviour

The mobile application behaviour of 30,000 Millennials from Australia, Hong Kong, Indonesia, Malaysia, Singapore and the United Kingdom was analysed (with permission) over one month (January 2016). Patterns of users were mapped based on their presence at several locations including shopping malls and banks. All these locations were geo-fenced[20]. Individuals were classified as either Millennial 'Savers' or Millennial 'Spenders'. Millennial 'Savers' are those who are more likely to save money through recognised applications and Millennial 'Spenders' are those who are more likely to spend money in various leisure activities – for example shopping, travelling, etc. Post-classification, Millennials were studied to derive insights on their digital mobile behaviour before buying and financing decisions were required for a car purchase, a house purchase, higher education and investment planning – some of the most significant decisions Millennials will make.
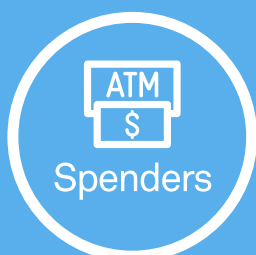
Spenders

From the Millennials in a particular geography, 'Spenders' are classified as the Millennials who:

- Were seen at shopping malls with a high frequency every month, and excluded people who were seen daily (to exclude people working at shopping malls);

- Were frequently seen at movie theatres, restaurants and retail outlets;

- Were frequently seen on shopping apps; and

- Were not seen frequently at banks.

Savers

From the Millennials in a particular geography, 'Savers' are classified as the Millennials who:

- Were not seen frequently at shopping malls;

- Were seen frequently on banking and investment apps; and

- Were seen frequently at banks, excluding the people who visited daily (to exclude people working at banks).

Life stage uses cases:

Car purchase: Apps for purchasing a car, searching for car insurance schemes, searching for various car-financing options.

House purchase: Apps for purchasing a house, searching for house insurance schemes, searching for various house-financing options.

Education purchase: Apps for planning higher education and distance education, student portals, paying tuition fees, buying books, searching for education loans, researching for best interest rates on various education loan providers, searching for various financing options.

Travel purchase: Apps for purchasing tickets, searching for travel insurance schemes, searching for various travel financing options.

3.0 THE MOBILE MILLENNIAL RESEARCH (CONT.)

3.3 Country insights and analysis (all data presented as an average)

3.3.1 Australia

With the growing economy, low interest rates and a rise in consumer spending it's clear that Australian Millennials are 'Spenders'. On average, among the total Millennials analysed, we observed that nearly 72 per cent were 'Spenders' and 28 per cent were 'Savers'. While twice as many males as females were 'Savers', three times as many males as females were 'Spenders'.

On average, Australian Millennial 'Savers' were seen on financial services applications once per day during early evenings, while Millennial 'Spenders' were seen on financial applications more than twice per day predominantly during late evenings. It is most likely that Millennial 'Spenders' in Australia research more, discuss with peers, take inputs and then make informed decisions (see tables 4-7).

3.3.2 Hong Kong

Hong Kong is an emerging market with enthusiastic mobile users. With one in four people using location based search, institutions have a greater likelihood of reaching Millennials via location intelligence. In the study, it was observed that nearly 64 per cent of Hong Kong Millennials were 'Spenders' and 36 per cent were 'Savers'. There were twice as many males as females in both Saver and 'Spender' categories.

While 'Savers' were observed researching using financial services apps twice a day, 'Spenders' were seen using financial services apps three times or more in a day, and mostly during night hours (see tables 4-7).

3.3.3 Indonesia

With higher consumer spending power and an increase in mobile downloads, Indonesia has witnessed rapid development of mobile services. In the study, it was observed that nearly 67 per cent of Millennials were 'Spenders' and 33 per cent were 'Savers'. While male 'Savers' outnumbered female 'Savers' by two-to-one, male 'Spenders' outnumbered female 'Spenders' by three-to-one. 'Savers' were seen on financial services apps once in a day while 'Spenders' were seen on financial services apps for more than two times in a day (see tables 4-7).

3.3.4 Malaysia

Millennials make up the largest consumer segment in Malaysia. In the study, it was observed that nearly 68 per cent of Millennials were 'Spenders' and 32 per cent were 'Savers'. There were three times more males in both categories than females. This may be due to the high ratio of males-to-females generally across the Millennials category. Overall, 'Savers' were seen on financial services apps three times in a day (usually during early evenings), while 'Spenders' were seen more than four times per day (typically during late evenings for their decision making purposes). It is clear that Millennials research on multiple apps. Ease of use and convenience are the driving factors for their usage behaviour (see tables 4-7).

3.3.5 Singapore

Singapore has a high smartphone penetration. As a result, Millennials are spending more time on mobile in this geography compared to other locations in the Asia-Pacific region. In the study, it was observed that nearly 60 per cent of Millennials were 'Spenders' and 40 per cent were 'Savers'. Among both the 'Spenders' and 'Savers', males were three times as common as females. Overall, 'Savers' were seen on financial services apps twice a day, usually during early evenings, while 'Spenders' were seen on financial services apps more than three times a day mostly during late afternoons and evenings (see tables 4-7).

3.3.6 United Kingdom

The United Kingdom has the second largest economy of Europe. It is a mature market. In the study, we observed that nearly 69 per cent of Millennials were 'Spenders' and 31 per cent were 'Savers'. While there were more than twice as many males to females in the 'Savers' category, they were three times as numerous as females among 'Spenders'. Overall, 'Savers' were seen on financial services apps only once per day, typically during late evenings while 'Spenders' were seen on financial services apps more than twice per day mostly during late evenings for their decision-making purpose. They appear to use apps frequently to gain a deeper understanding of financial products and services (see tables 4-7).

Table 4: Millennials by category, key decision and country

Breakup of Millennial Savers and Spenders							
Key Decision	Savers / Spenders	Australia	Hong Kong	Indonesia	Malaysia	Singapore	UK
During Car Purchase	Savers:Spenders Ratio	20:80	45:55	18:82	23:77	58:42	34:66
During Educational Purchase	Savers:Spenders Ratio	22:78	42:58	31:69	27:73	60:40	35:65
During House Purchase	Savers:Spenders Ratio	59:41	45:55	34:66	29:71	21:79	29:71
During Travel Purchase	Savers:Spenders Ratio	21:79	25:75	64:36	66:34	19:81	34:66

Table 5: Millennials by category, key decision, gender and country

Breakup of Millennial Savers and Spenders by Gender							
Key Decision	Savers / Spenders	Australia	Hong Kong	Indonesia	Malaysia	Singapore	UK
During Car Purchase	Savers Male:Female Ratio	65:35	64:36	58:42	84:16	73:27	62:38
During Car Purchase	Spenders Male:Female Ratio	67:33	78:22	81:19	88:12	78:22	70:30
During Educational Purchase	Savers Male:Female Ratio	64:36	68:32	82:18	66:34	70:30	66:34
During Educational Purchase	Spenders Male:Female Ratio	78:22	70:30	70:30	61:39	35:35	72:28
During House Purchase	Savers Male:Female Ratio	80:20	72:28	58:42	63:37	71:29	55:45
During House Purchase	Spenders Male:Female Ratio	75:25	68:32	75:25	59:41	69:31	82:18
During Travel Purchase	Savers Male:Female Ratio	60:40	72:28	62:38	81:19	69:31	86:14
During Travel Purchase	Spenders Male:Female Ratio	75:25	65:35	80:20	86:14	70:30	79:21

Table 6: Millennial 'Savers' by key decision, time on mobile, frequency of search on mobile and country

Digital Behaviour Millennial Savers							
Key Decision	Savers / Spenders	Australia	Hong Kong	Indonesia	Malaysia	Singapore	UK
During Car Purchase	Peak time on Mobile	16:00 to 19:00	18:00 to 21:00	17:00 to 20:00	19:00 to 22:00	17:00 to 20:00	18:00 to 21:00
During Car Purchase	Research Frequency on Mobile	1	2	2	3	3	1
During Educational Purchase	Peak time on Mobile	17:00 to 20:00	16:00 to 19:00	17:00 to 20:00	17:00 to 20:00	17:00 to 20:00	18:00 to 21:00
During Educational Purchase	Research Frequency on Mobile	1	1	1	1	1	1
During House Purchase	Peak time on Mobile	17:00 to 20:00	18:00 to 21:00	16:00 to 19:00	17:00 to 20:00	17:00 to 20:00	18:00 to 21:00
During House Purchase	Research Frequency on Mobile	1	2	1	2	3	3
During Travel Purchase	Peak time on Mobile	15:00 to 18:00	10:00 to 13:00	16:00 to 19:00	16:00 to 19:00	17:00 to 20:00	11:00 to 14:00
During Travel Purchase	Research Frequency on Mobile	2	1	1	4	2	1

Table 7: Millennial 'Spenders' by key decision, time on mobile, frequency of search on mobile and country

Digital Behaviour Millennial Spenders			Australia	Hong Kong	Indonesia	Malaysia	Singapore	UK
Key Decision	Savers	Spenders						
During car purchase	Peak time on Mobile		19:00 to 22:00	20:00 to 23:00	18:00 to 21:00	15:00 to 18:00	18:00 to 21:00	15:00 to 18:00
	Research Frequency on Mobile		2	3	4	5	2	1
During Educational Purchase	Peak time on Mobile		12:00 to 15:00	18:00 to 21:00	22:00 to 01:00	20:00 to 23:00	18:00 to 21:00	19:00 to 22:00
	Research Frequency on Mobile		2	1	1	2	1	1
During House Purchase	Peak time on Mobile		19:00 to 22:00	19:00 to 22:00	12:00 to 15:00	18:00 to 21:00	16:00 to 19:00	17:00 to 20:00
	Research Frequency on Mobile		2	3	2	3	5	5
During Travel Purchase	Peak time on Mobile		18:00 to 21:00	12:00 to 15:00	18:00 to 21:00	17:00 to 20:00	16:00 to 19:00	18:00 to 21:00
	Research Frequency on Mobile		3	2	1	5	4	2

Key takeaways

- On average, Millennials spend over 2.9 hours daily on their mobile phones.

- For Millennials, ease of use and convenience are the most important factors for apps.

- Millennials are great 'Spenders'. The ratio of Millennials 'Spenders' to 'Savers' is 2:1.

- Millennials usually use their mobile phones for research purposes during late evenings.

Key opportunities

- Millennial 'Spenders' research on mobile multiple times a day, especially during the late evening before making purchases. Institutions need to be present where Millennials are researching and at the right time to be considered in the purchasing decision.

- Millennials are highly active on social media apps. Institutions should study their social and location graphs to understand Millennials' usage trends and behavioural patterns so they can design their engagement strategies accordingly.

- With the increasing adoption of technology and higher smartphone penetration among Millennials' institutions should be digitally focused and look to the mobile as a source of actionable data from the consumer as well as a channel to the customer.

Millennials, affinity with mobile devices is increasing at a rapid pace – often driven by social media and entertainment content. Institutions can use location technology and data analytics to help personalise offers and deliver greater convenience to customers.

3.4 Methodology – personal data portability and frictionless mobile application concept appeal

With an understanding of the mobile behaviour of Millennials, their search behaviour and the role that location intelligence and analytics can play in creating valued personalised experiences across savings and spending activities, we now take a closer look at what happens when traditional and non-traditional service providers compete through apps and in real-time for specific saving, spending, borrowing and investing services when Millennials control their personal data.

The concepts tested were designed from insights from section 1 and the innovations listed in section 2.3. Beyond examining appeal, we specifically sought to understand whether Millennials preferred to have these services delivered by traditional or non-traditional financial service providers.

A total of 2,817 surveys were conducted with a representative online population across seven countries. Consumers were selected for the survey according to the following recruitment criteria:

1) equal split of male and female;

2) Millennials;

3) mix of net worth levels;

4) live in a metropolitan area;

5) spread of interviews across regions within each country;

6) have at least one financial product from the list provided;

7) have at least some involvement in decision-making regarding financial products; and

8) own and use a smartphone.

All data has been weighted to represent the total population of each country according to gender

3.5 Personal data portability and frictionless mobile application concept appeal by country

The results indicate a very robust level of appeal across all countries for all four concepts, ranging between one in two and up to eight in ten of respondents finding these concepts appealing. China and Indonesia demonstrate the highest levels of appeal across all concepts tested. The lending and saving-related concepts were most appealing (see figure 17).

Figure 17: Personal data portability and mobile application concept appeal by country

Appeal scorecard		A. Lending (Loan)	B. Lending (Mortgage)	C. Saving	D. Investing
Australia		61	62	61	49
Hong Kong		41	47	49	48
Indonesia		73	78	70	63
China		77	80	76	76
Singapore		59	55	58	50
UK		59	60	61	48
USA		68	65	63	57

Source: Telstra Research 2016

These results reflect the pressure points and innovations outlined in section 2.3. As we noted in section 1, while Millennials overwhelmingly trust traditional providers, a significant proportion (two in three) are open to non-traditional service providers. This also reflects that technology (particularly mobile) is inextricably linked into Millennials' personal and financial lives. As technologies evolve to enable more dynamic, contextual and personalised modelling of risk, mobile applications have the ability to flip the purchasing decisions of Millennials. We now take a detailed look at each concept by country and provider preference.

3.5.1 Concept A – Lending (loan) for a car

One in two Australian and American Millennials prefer traditional institutions for this concept. As illustrated in the global results, a significant proportion (one in two) of Millennials from Hong Kong, Singapore, and the UK don't have a preference, while Indonesians prefer non-traditional providers. Australia and British Millennials hold the lowest preference for non-traditional providers for this concept (see figure 18).

Figure 18: Preference for provider of concept A

■ Traditional Financial Insitution   ■ I don't have a preference   ■ Non-traditional provider

Country	Traditional Financial Insitution	I don't have a preference	Non-traditional provider
Australia	45	42	13
Hong Kong	40	41	19
Indonesia	35	30	36
China	36	35	29
Singapore	38	41	21
UK	38	48	14
USA	45	37	18
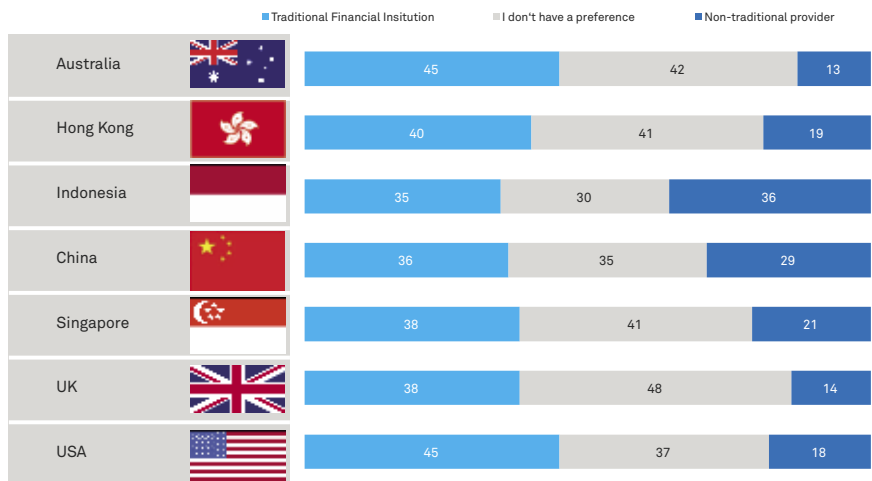
Source: Telstra Research 2016

Themes of convenience, speed and ease of use appeal in the lending (loan) concept. Instant access to information and loan approval also drives the appeal of this concept to Millennials (see figure 19).

Figure 19: Preference for provider of concept A thematically analysed and verbatim

Source: Telstra Research 2016

DRIVERS OF APPEAL

"Convenient, on the spot approval. I have a preference for speaking to people at financial institutions but not having to prepare extensively beforehand. I always seek reviews regarding any type of service or product that I am contemplating."

"Convenience – save the hassle of physically going to each car dealer shop to compare the prices one-stop service – settle the payment on the spot"

"Everything looks fast and I can walk away with the car fast."

"Getting comparison prices to get the best deal is very appealing, also the ability to check ratings is a bonus."

"It would ensure you get the best deal available and great how simple and easy it would be."

"You can settle everything on your phone and walk away with the car that fast, save time."

"It's convenient – all the information is available with a touch of a finger to allow for a quick yet thorough decision."

3.5.2 Concept B – Lending (mortgage) for home purchase

It's unanimous. When buying a home, one in two Millennials across all countries preferred traditional financial institutions for this concept. That said, a significant proportion (one in three) of Millennials from Australia, Hong Kong, China, Singapore, the UK and the USA report not having a preference. Millennials from Australian and Hong Kong hold the lowest preference (one in ten) for non-traditional providers for this concept, but one in three Indonesian Millennials preferred them (see figure 20).

Figure 20: Preference for provider of concept B

	Traditional Financial Insitution	I don't have a preference	Non-traditional provider
Australia	51	40	10
Hong Kong	48	37	16
Indonesia	40	26	34
China	46	31	23
Singapore	46	36	18
UK	43	39	18
USA	42	41	17

Source: Telstra Research 2016

Reducing the inconvenience, complexity and time associated with the mortgage process underlies the appeal of the lending (mortgage) concept. Simplifying the mortgage application process resonates with Millennials (see figure 21).

Figure 21: Preference for provider of concept B thematically analysed and verbatim
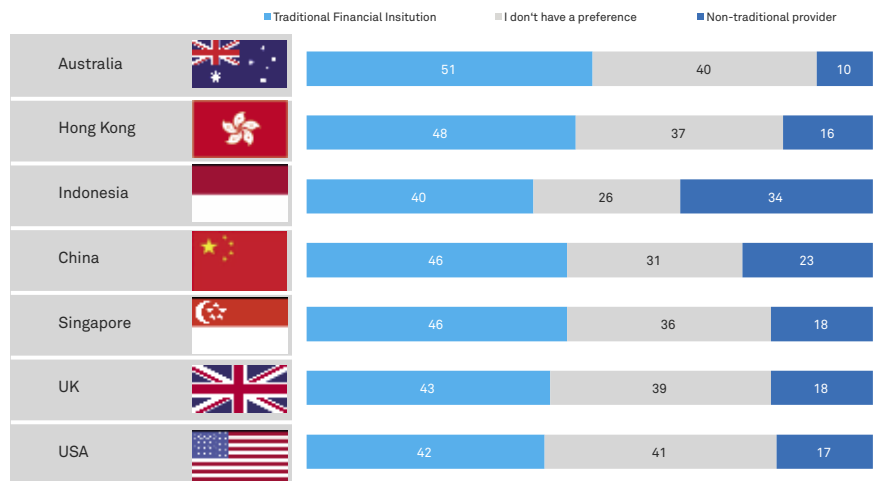

Source: Telstra Research 2016

DRIVERS OF APPEAL

"Because the home loan application process can take a very long time and it can cause a lot of stress."

"Easier process as well as quicker with less paper work and nonsense overall."

"Easy and all the work is done for you. Convenient"

"It saves a lot of hassles that a person will need to go through and save a lot of time."

"It saves the trouble and paperwork needed to get loans approved. More importantly, I know that I'm getting the lowest interest rate charges as it shows me the comparison between various plans by different banks."

"It seems to simplify the mortgage process, don't need to shop around as much if all providers see the details and make their "best offer"."

"It would be nice to not have to gather all the paperwork and take to each lender. it is nice that the lenders can look at the info in one centralised location and then they can tell me their information."

3.5.3 Concept C – Saving for a big purchase

One in two British Millennials don't have a provider preference when it comes to saving. Millennials across all countries preferred traditional financial institutions for this concept (one in two). However, a significant proportion (one in three) of Millennials across all countries don't have a preference. Australia, Hong Kong and the USA had the lowest preference for non-traditional providers (see figure 22).

Figure 22: Preference for provider of concept C

■ Traditional Financial Insitution ■ I don't have a preference ■ Non-traditional provider

Country	Traditional Financial Insitution	I don't have a preference	Non-traditional provider
Australia	53	36	12
Hong Kong	48	36	17
Indonesia	38	30	32
China	42	35	23
Singapore	49	33	18
UK	39	43	18
USA	48	35	17

Source: Telstra Research 2016

Flexibility and convenience in accessing and transferring funds resonates strongly here, as does increased interest-earning potential. Millennials find the convenience aspect of the concept highly appealing (see figure 23).

Figure 23: Preference for provider of concept C thematically analysed and verbatim

Source: Telstra Research 2016

DRIVERS OF APPEAL

"Because the app makes it easy to see what is happening to your money in real-time."

"Easy to get money and digitally transfer."

"There's much flexibility in this concept. It's also convenient and appealing to have different proposals housed under one roof."

"Very convenient and seems very flexible, comparing for fixed deposits from banks. must be secured and competitive interest rates."

"It sounds like a good way to accrue interest and still be allowed to take out your money whenever you need it."

"It sounds like a fairly easy way to make money, who doesn't want a higher interest rate on savings?"

"This should provide higher interest rates than putting money in the banks."

"When you need your money you access the app and transfer it to your traditional bank account including the interest."

3.5.4 Concept D – Long term investing

One in two British Millennials do not have a preference when it comes to investing. One in two Millennials across Australia, Hong Kong, China, Singapore and the USA preferred traditional financial institutions for this concept. A significant proportion (one in three) of Millennials across all other countries expressed no preference. Millennials from China indicated a clear preference for non-traditional providers (see figure 24).
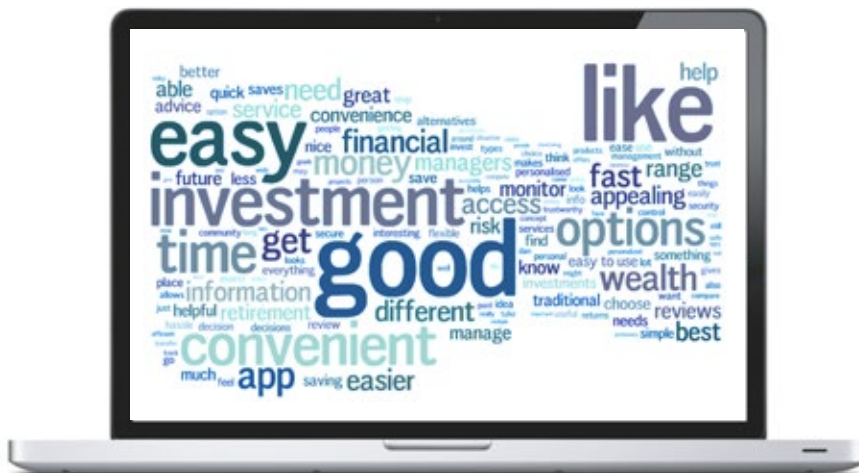
Figure 24: Preference for provider of concept D

	Traditional Financial Institution	I don't have a preference	Non-traditional provider
Australia	48	41	11
Hong Kong	49	35	16
Indonesia	34	32	35
China	42	35	24
Singapore	50	33	17
UK	37	47	16
USA	47	40	13
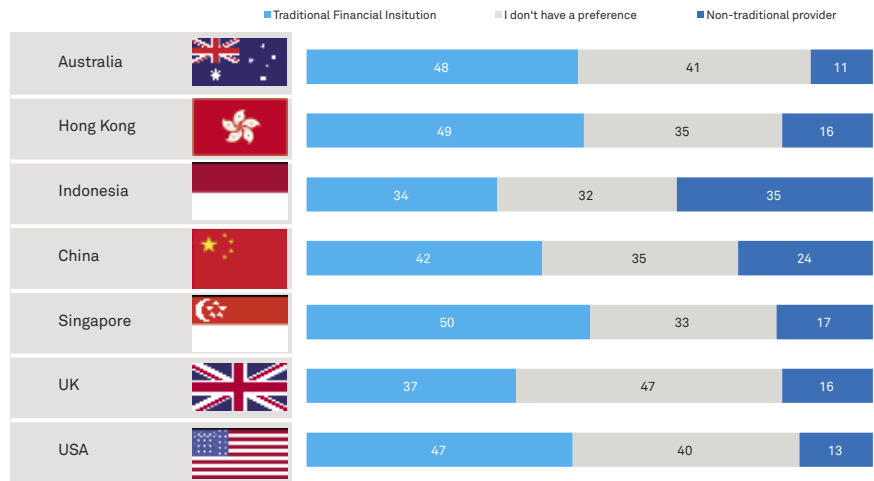
Source: Telstra Research 2016

Access to investment information and options interests consumers, who are also drawn to the time-saving and ease-of-use benefits. Millennials appreciate the convenience of not needing a face-to-face meeting (see figure 25).

Figure 25: Preference for provider of concept D thematically analysed and verbatim

Source: Telstra Research 2016

DRIVERS OF APPEAL

"Being able to keep track of multiple investments in one easy app sounds like a good idea."

"Easier, all options are given to you upfront, ability to monitor investments whenever."

"It's convenient and adds competition into the financial sector."

"It allows me to understand without meeting a financial planner. I can read up and review on my own before seeking more information."

"Seems convenient that you have someone who's more an expert to help you with the decisions."

"This is straightforward and easy, save the hassle and time needed to meet up with wealth managers/advisers. I can also make the decision on my own time without feeling the pressure from wealth managers."

"A range of alternatives, able to simply click on an app to review the options and input my preferences."

"It is easier to access any time. No appointments, no giving up work etc."

We can see that, across all concepts, Millennials are either open to non-traditional providers, or do not have a preference for providers when they are in control of their personal data. We will now take a look at the supply side and how innovative developments in fintech are responding to the overall needs of Millennials.

4.0 FINTECHS – MADE FOR MILLENNIALS

"Fintech start-ups targeting Millennials have attracted US$3.7 billion in funding more than 150 deals over the past five years. Whether in stock trading, consumer lending, personal savings or buying insurance, start-ups are innovating with the importance of this demographic in mind and it's clear investors are paying attention."

**Matt Wong,
Senior Analyst at CB Insights 2016**

Millennials are investing, lending and sharing money quite differently to the generations before them, assisted by a growing set of tech-driven tools.

The changing ways that Millennials manage their money, their use of mobiles and their openness to alternative providers are top of mind for many of the largest financial institutions in the world.

In response, a host of fintech start-ups and fintech investors are focusing on Millennials as a key demographic via mobile-first neo-banks, robo-advisers offering low-cost alternatives to brokerages, lending firms innovating in credit-risk analysis, and stock-picking and automated savings apps.

Many of the fintech start-ups are leveraging existing technologies already popular among young adults, such as social networks, apps and mobile messaging. Project crowdfunding sites GoFundMe and the Andreessen-Horowitz backed Tilt, for example, either mirror or take advantage of social networks and are very popular among college audiences. Google Ventures and the General Catalyst-backed HelloDigit transfer money directly via text message.

Figure 26 breaks down the set of primarily US-based fintech companies appealing to the Millennial generation including Robinhood, Acorns, Wealthfront, Earnest and more. Separately, start-ups in the digital banking market have attracted more than US$10 billion since 2010. Note – since CB Insights first published this graphic, nearly two-dozen new companies have been added and a few such as Square and Venmo have progressed to IPOs or have otherwise exited and been removed.

Figure 26: Fintech for Millennials graphic

Source: CB Insights 2016

4.0 FINTECHS – MADE FOR MILLENNIALS (CONT.)

4.1 Fintechs for Millennials

Below is a list of the companies illustrated in the graphic (figure 26), further detailing their major early-stage investors and service category. We note that of the 63 fintechs, one in two target the savings and spending categories and one in three target the investing/wealth management categories – highlighted in previous sections aligned to Millennials' financial priorities.

Company	Select Investors	Category
Tilt	Doll Capital Management, Felicis Ventures, Andreessen Horowitz	Crowdfunding
GoFundMe	Bootstrapped	Crowdfunding
Chime	Crosslink Capital, Forerunner Ventures, Homebrew, PivotNorth Capital	Mobile Banking & Payments
Final	Y Combinator, T5 Capital, Ludlow Ventures	Mobile Banking & Payments
Coin	SoftTech VC, Spark Capital, Redpoint Ventures	Mobile Banking & Payments
Moven	Artemis Group, Ratpor Ventures, SBT Venture Capital, Route 66 Ventures	Mobile Banking & Payments
Verse	Draper Fisher Jurvetson, Bernardo Hernandez	Mobile Banking & Payments
Circle	Accel Partners, General Catalyst partners, Breyer Capital, Goldman Sachs	Mobile Banking & Payments
Xendit	Y Combinator	Mobile Banking & Payments
Abra	American Express Ventures, Arbor Ventures, First Round Capital, RRE Ventures	Mobile Banking & Payments
Hello Digit	Google Ventures, Baseline Ventures, Freestyle Capital, General Catalyst Partners	Savings & Finances Tracking
BoostUp	Detroit Venture Partners, Michigan Pre-Seed Capital Fund, Cornerstone Angels	Savings & Finances Tracking
Prism	Chase Frankling, John Keister, Mark Britto, Rudy Gadre	Savings & Finances Tracking
Splitwise	IDG Ventures, Great Oaks VC	Savings & Finances Tracking
BillGuard (Prosper)	Bessemer Venture Partners, Founders Fund, IA Ventures, Khosla Ventures	Savings & Finances Tracking
Sweep	N/A	Savings & Finances Tracking
Acorns	JAM Equity Partners, Greycroft Partners, e.ventures	Savings & Finances Tracking
Even	Khosla Ventures, Red Swan Ventures, Rothenberg Ventures, Homebrew, Slow Ventures	Savings & Finances Tracking
Qapital	Northzone Ventures	Savings & Finances Tracking
PolicyGenius	AXA Strategic Ventures, Karlin Ventures, MassMutual Ventures, Revolution Ventures, Transamerica Ventures, Susa Ventures	Insurance (Non-Health)
Sure	ff Venture Capital, OVP Venture Partners	Insurance (Non-Health)
Trov	Anthemis Group	Insurance (Non-Health)
Lemonade	Aleph, Sequoia Capital	Insurance (Non-Health)
Homeslice	Matchfire	Savings & Finances Tracking
Loyal3	DNS Capital	Personal Investing
Motif Investing	Norwest Venture Partners, Foundation Capital, Ignition Capital, Goldman Sachs	Personal Investing
Robinhood	Google Ventures, Index Ventures, Andreessen Horowitz, Ribbit Capital, NEA	Personal Investing
Stox	SingulariTeam	Personal Investing
Stash	N/A	Personal Investing
Kapitall	Bendigo Partners, Linden Venture Fund	Personal Investing
Tip'd Off	Raj Parekh, Bill Crane, Shaun Coleman	Personal Investing
DriveWealth	Route 66 Ventures	Personal Investing

Company	Select Investors	Category
Openfolio	Fintech Collective	Personal Investing
eToro	BRM Group, Ping An Ventures, Spark Capital	Personal Investing
Wealthfront	DAG Ventures, Index Ventures, Greylock Partners, The Social+Capital Partnership	Wealth Management
Betterment	Bessemer Venture Partners, Athemis Group, Menlo Ventures	Wealth Management
SigFig	Doll Capital Management, Union Square Ventures, Bain Capital Ventures	Wealth Management
Personal Capital	Institutional Venture Partners, Venrock, Crosslink Capital	Wealth Management
WiseBanyan	VegasTech Fund	Wealth Management
Hedgeable	SixThirty	
Rebalance IRA	N/A	Wealth Management
Blooom	Commerce Ventures, DST Systems, Hyde Park VP, QED Investors, UMB Financial	Wealth Management
Aspiration	Renren, GSV Capital, Capricorn Investment Group, IGSB	Wealth Management
Affirm	Lightspeed Venture Partners, Khosla Ventures, Spark Capital, Andreessen Horowitz	Loans & Credit Risk
Earnest	Atlas Venture, First Round Capital, Maveron, Andreessen Horowitz, Collaborative Fund	Loans & Credit Risk
Tuition.io	Mohr Davidow Ventures, Neu Venture Capital, Fenway Summer, Rothenberg Ventures, MESA+	Loans & Credit Risk
Valore	Flybridge Capital Partners, Atlas Venture, North Hill Ventures	Loans & Credit Risk
Pave	-	Loans & Credit Risk
Upstart Network	Founders Fund, Khosla Ventures, First Round Capital, Google Ventures, Kleiner Perkins, NEA	Loans & Credit Risk
SoFi	Innovation Endeavors, Renren, Baseline Ventures, Doll Capital Management	Loans & Credit Risk
Vouch Financial	Greylock Partners, First Round Capital, IDG Ventures USA, Core Innovation Capital	Loans & Credit Risk
Vested Finance	Sandleigh Ventures	Loans & Credit Risk
CommonBond	The Social+Capital Partnership, Tribeca Venture Partners, Nelnet	Loans & Credit Risk
WeFinance	N/A	Loans & Credit Risk
Credible Labs	Redbus Group, Carthona Capital, Ron Suber, Scott Langmack, Soul Htite	Loans & Credit Risk
Bread	Bessemer Venture Partners, BoxGroup, Cue Ball Capital, Greycroft Partners, Maveron, RRE Ventures	Loans & Credit Risk
Credit Sesame	Inventus Capital Partners, Menlo Ventures, Globespan Capital Partners, IA Capital	Loans & Credit Risk
Credit Karma	Felicis Ventures, Ribbit Capital, Susquehanna Growth Equity, Tiger Global, Google Capital	Loans & Credit Risk
Lenda	China Growth Capital, Rubicon VC, 500 Startups	Loans & Credit Risk
Sindeo	Renren, New Ground Ventures	Loans & Credit Risk
Backed	Cyhawk Ventures, iAngels	Loans & Credit Risk
Lenny	N/A	Loans & Credit Risk
LendKey	DFJ, Gotham Ventures, TTV Capital, Updata Partners	Loans & Credit Risk

Investors clearly see the Millennials' appetite for saving, spending, borrowing and investing services. The overwhelming level of interest in fintech from investors outside the financial services industry also reflects the significant lack of investors from inside the financial services sector. But this is changing. Many large tier-one institutions have now established venture groups with funds and many are supporting fintech incubators, while others are loosely partnering. For example at a recent fintech meeting in Melbourne, ANZ's CEO Shayne Elliott discussed how the bank is set to acquire and invest in emerging fintech companies as the bank seeks to improve its in-house capabilities through partnerships[21]. BBVA recently announced a new independent US$250 million fund manager closing its US$100 million fund that had been in operation since 2013[22].

In the past 12 months to Q4 2015, corporates and their venture capital groups have participated in one in every four fintech deals[23], however this varies by region, with Q4 results showing Asia leading at 40 per cent, followed by America at 25 per cent and Europe at 10 per cent.

4.2 Challenger banks and neobanks

A growing focus on consumer experience and digital services in retail banking has led venture capital investors to put over $250 million in deals with 'neobanks' and, increasingly, digital-only challenger banks. Some of these have evolved from personal financial management apps into money management services.

While neobanks such as Moven and Number26 offer a mobile-first banking experience in partnership with a traditional bank, so-called challenger banks have applied to become fully licensed banks, creating new data-driven banking experiences and pricing models from the bottom-up. The rise of these disruptors has been particularly notable in the UK, where regulators including the Financial Conduct Authority and the Prudential Regulation Authority have approved multiple start-ups for bank licenses. In the past two years, up to twenty start-ups have been thought to be exploring banking licenses.

As Figure 27 highlights, investors are increasingly keen to fund UK-based digital challenger banks amid a wider boom in digital banking. Notably, Atom Bank, the first challenger bank in the UK to receive regulatory approval, took a $128 million minority investment from BBVA in November. Other active and funded digital challenger banks operating in the UK also include Tandem Bank, Mondo and Fidor Bank.

Figure 27: Challenger banks and Neobanks

Notable Digital Challenger Banks & Neobanks
By total disclosed funding

Atom Bank	$167.2
Moven	$24.4
SIMPLE	$15.3
NUMBER26	$12.6
numbrs	$11.5
fidor BANK	$5.0
mondo	$3.1
Rocketbank	$2.0
monese	$1.8
HOLVI	$1.4
KOHO	$1.0
STARLING	*
TANDEM	**

■ Digital challenger bank (applying for/has full license)

■ Neobank

*Starling was reported to be raising $15.7M in August '15
** Undisclosed funding, counts Route 66 Ventures among its investors

Source: CB Insights 2016

BankMobile (a mobile-only division of the Phoenixville, Pennsylvania based Customers Bank) in the United States reports it has reached a staggering 100,000 users in its first year of operation – and expects to have two million accounts by mid-2016. The bank targets students and aims to set new standards of customer experience for first-time banking relationships.

In a more recent development, a Hong Kong mobile banking start-up named Neat announced its intention to launch in Q2 2016, targeting university students and young professionals[24]. Describing itself as an artificial intelligence company that does banking, it claims the service will include facial recognition technology to authenticate users at login and plans to use artificial intelligence to user payment data and geo-location technology to offer personalised and localised offers to users.

5.0 TECHNOLOGY MAELSTROM IN A MOBILE MILLENNIAL-DRIVEN WORLD

"In the future, if a business is not mobile-first and digital to the core, if it does not present on an app or an icon on a customer's handset, then effectively it will simply not exist."

**Andrew Penn,
CEO Telstra Corporation**

In section 2 we examined five mega trends driving disruption in financial services. A few themes reoccurred throughout this examination:

- **A need for greater agility.** Innovative solutions need to be developed, tested and produced quickly and cheaply. Those able to exploit highly capable horizontal platforms for digital service delivery are at a competitive advantage.

- **A need to collaborate with other innovative services and their providers.** Of course, as a corollary, the boundaries between services and providers become blurred.

- **A greater need for intelligence,** preferably in near real time and from customers and their environment, from processes and from the market as well as the ability to exploit that intelligence more quickly and effectively.

These industry mega trends are occurring during the confluence of a number of massive technological mega trends. This confluence goes by many names: SMAC (social, mobile, analytics and cloud), the Third Platform, the Nexus of Forces and many more. Essentially this confluence brings technologies from a number of key areas:

- The rapid maturation of the next generation of platforms on which digital services (and particularly mobile digital services) are being built.

- A seismic change in our ability to ingest, manipulate and analyse massive amounts of data, and to do so at speed.

- The potential of the Internet of Things (IoT) to give us visibility of people and the physical world they inhabit as well as to control that world.

This maelstrom of industry and technology changes also challenges some of the fundamental principles of financial systems – namely trust, security and identity.

Let us examine each of these areas of technology change in more detail.

Digital Mobility

Everything and Everyone is connected

Everything is intelligent

What can be measured will be measured

Analytics removes friction

Big Data

IoT
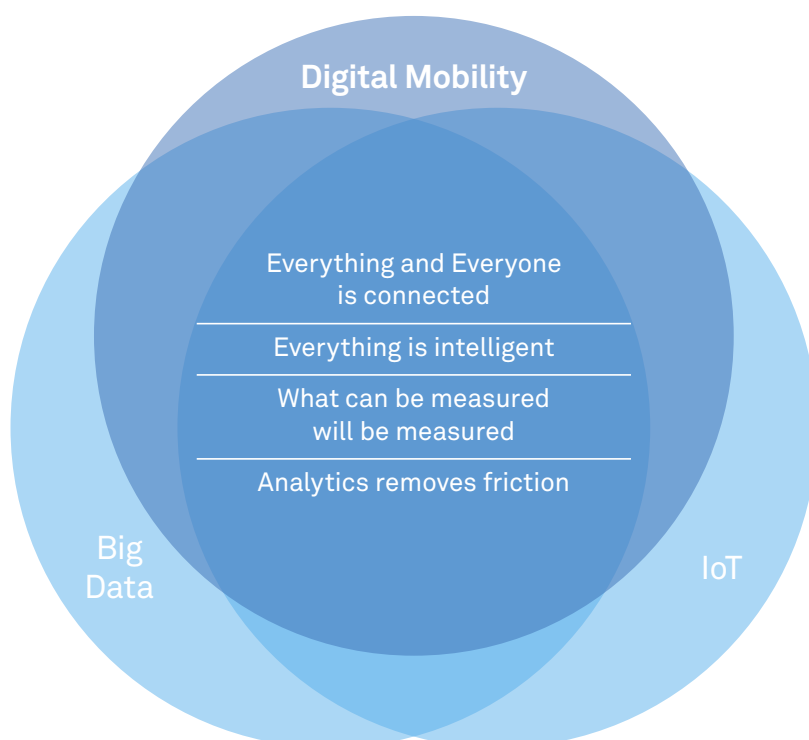
5.1 Digital platform-as-a-service

We've seen that, in a fintech world, both full-stack financial service providers and those focused on particular financial service components increasingly need to seamlessly integrate their offering with those of other service providers, whether financial or non-financial (fintegration). What's more, they need to be able to personalise these services and orchestrate them in a very agile way. Indeed, the ability to personalise and plumb financial services into lifestyle processes stands to become a critical differentiator for institutions.

For many consumers (and particularly Millennials), the smartphone is undoubtedly the gateway of choice to digital services. But when it comes to mobile banking applications, apps aren't apps. Forrester[25] conducted a major global study of 41 large retail banks offering mobile banking services. Forrester constructed a composite measure of functionality by analysing:

- range of touchpoints;
- enrolment and login;
- account information;
- transactional functionality;
- service features;
- cross-channel guidance; and
- marketing and sales.

While Forrester reported an average functionality score of 61, what is immediately apparent from figure 28 is the huge variation in mobile functionality across the institutions studied.

Figure 28: Mobile banking functionality benchmark
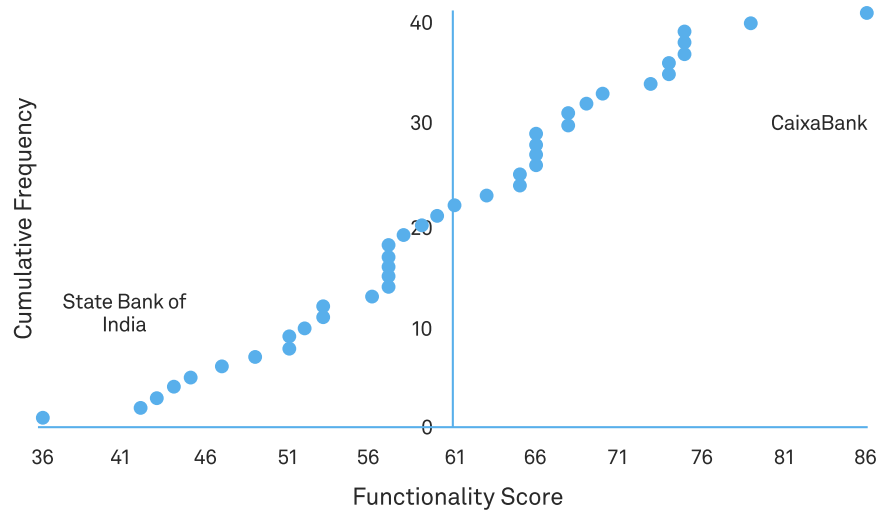
Source: Forrester, 2016

Forrester also reported that a small group of institutions have out-performed their peers, referring to the introduction of substantial improvements in transactional features, functionality and additional services as a reason driven by adoption of a test-and-learn approach to functionality and an agile approach to development.

Let's have a look at some of the technologies enabling this agility and reshaping the way in which institutions provide digital services.

5.1.1 Software-defined networking

Traditional networks employ hierarchies of network elements (e.g. switches and routers), with control and configuration distributed throughout the network. As a result, configuration is usually quite static, meaning networks can't respond to the dynamically changing demands of modern applications and services. Software-defined networking (SDN) centralises control in a new element called a 'SDN controller' which intelligently orchestrates network hardware throughout the network. These controllers expose APIs that allow the network to be controlled programmatically. This means an application can dynamically request network features such as lower latency, higher bandwidth or enhanced security. SDN provides an efficient way of controlling temporary access to particular physical or virtual networks critical for emerging permission-based block chain or distributed ledger technologies. In a world where services are dynamically constructed by orchestrating service components, executing smart contracts and recording events and transactions in ledgers distributed across a range of organisations, this capability offers an efficient mechanism to substantially decrease exposure to compromises (see figures 29 and 30).

Figure 29: Traditional network environment
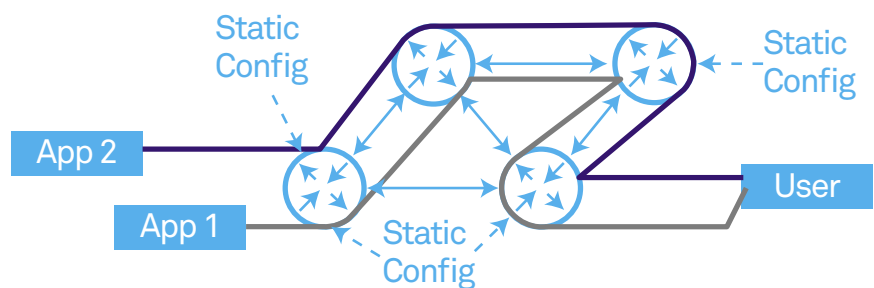
Source: Telstra Research 2016

Figure 30: Typical SDN environment
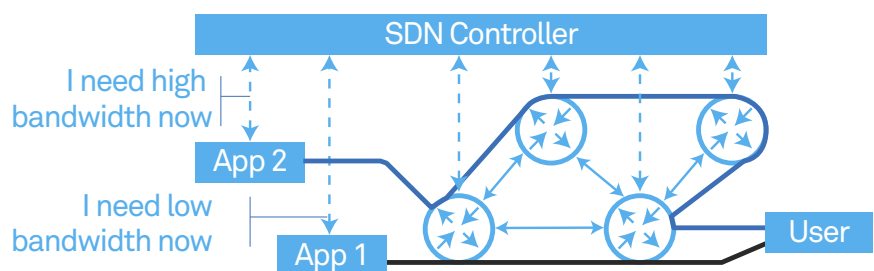
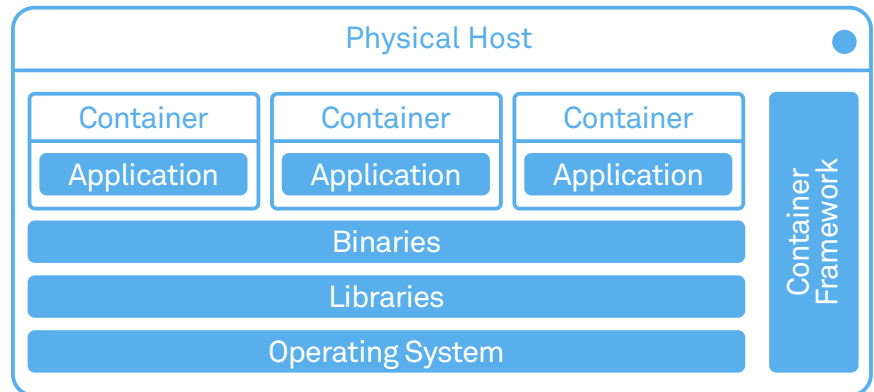Source: Telstra Research 2016

5.1.2 Containerisation

Virtualisation has helped fuel the cloud revolution, transforming infrastructure such as servers into logical entities that share resources on a common host. However, these virtualised servers (or Virtual Machines – VMs) are still complex heavyweight entities – with their own operating system, file system, application and service stack. This means initiating or moving VMs can be a slow process. An emerging alternative is containerisation, where applications share an operating system, libraries and binaries as well as physical resources, but are still securely isolated from each other. Containers are much lighter-weight entities and are much more portable. As demand for services grows, shrinks or shifts, containerised services can rapidly be instantiated or moved to address the load (see figures 31 and 32).

Figure 31: Typical virtualised architecture
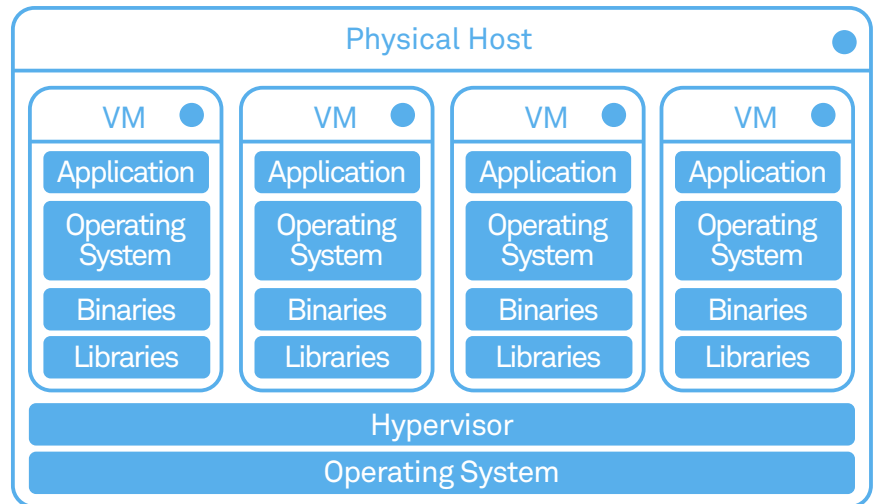
Source: Telstra Research 2016

Figure 32: Containerised architecture

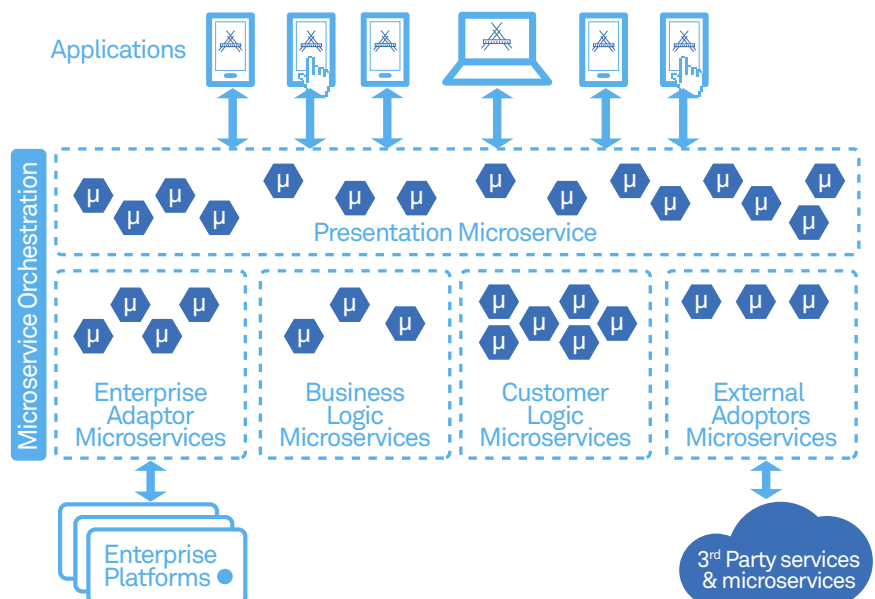Source: Telstra Research 2016

5.1.3 Microservices

Often closely associated with containerisation are microservices. In a microservice, architecture applications are composed by connecting and orchestrating many small, loosely coupled, atomic functional building blocks that communicate using common web-centric protocols. Practically, a microservices approach promises a number of benefits including faster development times, greater reuse, greater correctness, stability and scalability. Additionally, since microservices are based on web-centric APIs and protocols, mature API management and configuration management tools can be used to improve maintainability (see figures 33 and 34).

Figure 33: Typical service oriented architecture
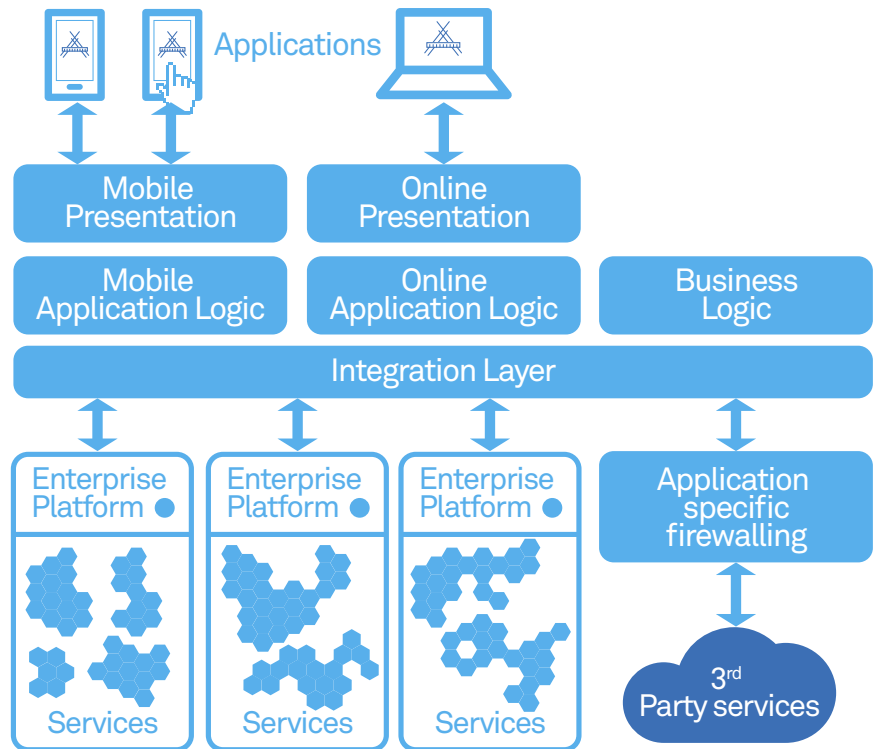
Source: Telstra Research 2016

Figure 34: Typical microservice architecture

Source: Telstra Research 2016

Microservices:

- Must be as small and simple as possible

- Are autonomous and independently deployable, not integral parts of monolithic enterprise systems

- Are loosely coupled to each other and applications

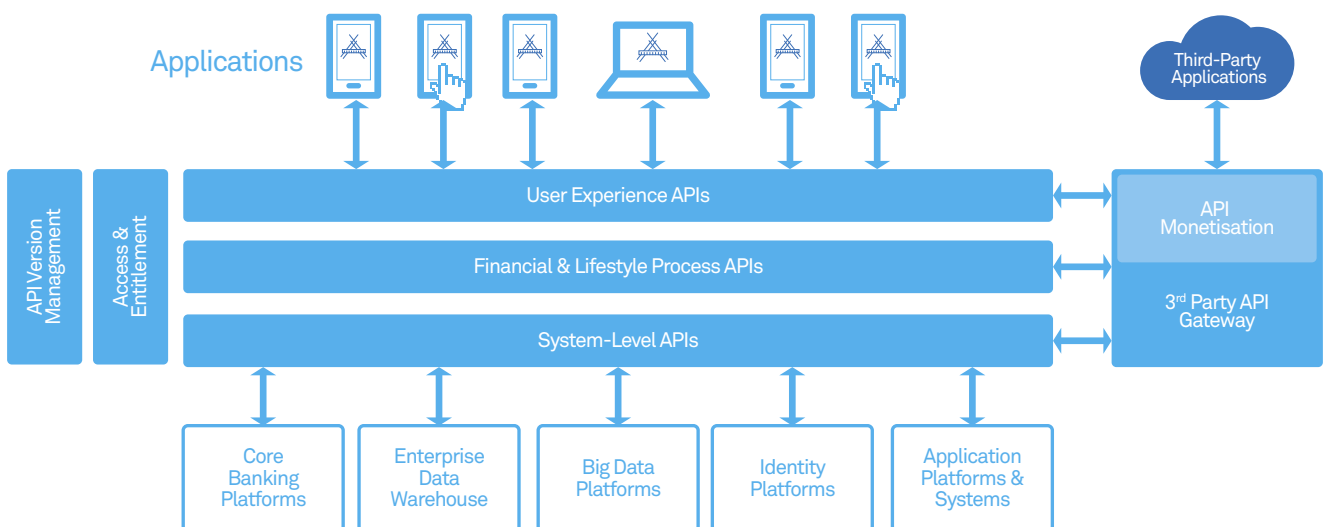- Interact via clean language-agnostic APIs

5.1.4 Application programming interfaces (APIs)

Platformification (or finance-as-a-service) is emerging as a way for institutions to create new business models. API technology allows software to interact with other software and can enable organisations to flexibly expose services and data that can be orchestrated to form new and innovative products. Open APIs allow third parties to

develop applications that exploit an institution's data, services and processes. Financial aggregation services and comparison websites are classic examples where open APIs can create new models for consuming financial services. Modern API platforms provide the ability to lifecycle manage, expose and disseminate APIs in ways that help reduce friction for developers. These platforms also provide features to support the monetisation of APIs, providing institutions with new avenues to derive returns from existing investments in data and services.

Many financial institutions expose some basic capability (such as payments) through APIs. Some organisations such as Citigroup and Capital One are more advanced, exposing a much broader array of software capability and data to outside applications. In Europe, governments are pushing banks to allow third-party access to customer data. The UK government commissioned a report on bank data sharing and has formed the Open

Bank Working Group, which is due to publish a framework for APIs by the end of 2016[27]. In 2015, the European Commission issued the Payments Services Directive 2[28] that includes among other things, a requirement for banks to allow apps access to their customers' accounts upon request by the customer, typically through APIs, by the end of 2017. Progressive incumbents such as Credit Agricole and newer innovators such as Fidor Bank and Starling Bank are in the advanced stages of their API strategies. In Germany, Sutor Bank, founded in 1921, is reported to be launching a new set of APIs to provide fintechs with a full range of banking processes including investing, lending and payments[29].

The ability to skilfully implement APIs that expose financial service components and data is becoming a key enabler of agile innovation. Doing so in a way that attracts external developers is becoming a critical way for institutions to participate in innovation ecosystems.

Finance-as-a-Service

Applications

User Experience APIs

Financial & Lifestyle Process APIs

System-Level APIs

API Version Management

Access & Entitlement

Third-Party Applications

API Monetisation

3rd Party API Gateway

Core Banking Platforms

Enterprise Data Warehouse

Big Data Platforms

Identity Platforms

Application Platforms & Systems

Source: Telstra Research 2016

Scenario 1 provides a picture of how SDN, containerisation, microservices and API's can significantly change the way that digital financial services are delivered - embedded as components of services that directly support major lifestyle processes.

Scenario 1: Joanna buys a house

Joanna has been looking for the right house for six months and has been part of the HouseFly online community for the duration. During an auction, the HouseFly mobile app guides her bidding by instantly gathering provisional financing offers in real time. As bidding progresses she sees both the list of recommended providers and the impact on her likely repayment strategy change.

After putting in the top bid Joanna leans towards a package from FinCo, however she has a query. HouseFly instantly connects her by video to Christian, a FinCo specialist who answers her question. She accepts the offer through the app and can confirm her bid instantly.

Behind the scenes a whole array of microservices are instantiated to manage the real-time auction for Joanna's business that mirrors the property auction. Temporary secure network links are established between bidding providers and HouseFly to share information about Joanna's history and the property she is bidding on. When Joanna speaks with Christian, a temporary high bandwidth, low-latency link is created between Joanna's handset, HouseFly and FinCo to ensure a good video experience.

We saw earlier that trust and security are areas where traditional financial institutions and banks in particular, hold a significant and strategic trust advantage. Trust is hard won and a source of competitive advantage that is also easily damaged, so let us look at some the approaches that are enabling providers to maintain a high level of customer trust.

5.2 Cybersecurity, cyber trust and identity

We understand that the world in which financial services are delivered has changed radically. It is a world where an end user application might involve service components distributed across tens or hundreds of organisations. A world where Bring Your Own Device limits the control organisations have over the devices and applications their employees use. A world where organisations can dynamically create, reconfigure and deploy new networks in near real time. A world in which the chains of data used to inform the business decisions that guide service personalisation and delivery are enormous and complex. Meanwhile, technological advances in mobility and Internet connectivity; smart phones and tablets make it easier for users to access applications, information and services on the move, across devices.

The requirements for the confidentiality, integrity and availability (CIA) of data and systems haven't changed, nor has the fundamental role of identity in financial services. In fact, these requirements have become even stronger. However, the technologies to provide these are evolving. Let's examine a couple of areas experiencing rapid development.

5.2.1 Identity and personal data portability

The basis of much of the financial services ecosystem is identity. Most institutions focus almost exclusively on establishing the identity of individuals; however, as more of the business decisions underpinning financial services rely on an automated system conducting analysis on data gathered from a myriad of disparate and often fully automated sources, the concept of identity has to be expanded. Establishing the identity of devices and systems becomes just as critical as identifying humans. Advanced developments of limited disclosure technologies enable the creation of new ecosystems as personal data portability puts Millennials in control. (See our previous report 'Mobile Identity – The Fusion of Financial Services, Mobility and Identity' for a detailed examination of how identity is evolving in financial services[30]).

5.2.2 The collapse of perimeter security

Traditionally, enterprise systems were housed in fortified, firewalled networks typically with a strong hard perimeter but, all too often, with a marshmallow centre. It is assumed that users, systems or services inside the perimeter can be trusted – compromising any one of these allows access to the whole fortified realm. Cyberattacks advanced and a single perimeter was recognised as a brittle approach, so organisations set up perimeters within perimeters – known as defence in-depth. However, in the new world described above, there often is no clearly defined perimeter to fortify. At the same time a workhorse tool of perimeter security traffic inspection is becoming more difficult. Confidentiality concerns mean that more network traffic is encrypted. Encryption makes traffic inspection very difficult, requiring complex chains of certificates to be preloaded into firewalls etc. along the path. This creates significant management overheads and complexity and increases the risk of particular forms of attack such as 'man-in-the-middle' attacks.

This has driven a shift in focus to endpoint security and intelligent networks. Rather than focusing on organisational or system boundaries, end-point security lives natively within ecosystem end-points (whether that is a cloud application, a microservice, a mobile device or a traditional enterprise system). End-point protection offers mechanisms to detect malware, identify suspect activity and to restrict data leakage at the last point in the chain. End-point security lives at the very deepest layers of software beyond the end of encrypted tunnels and is supported natively by operating systems and applications.
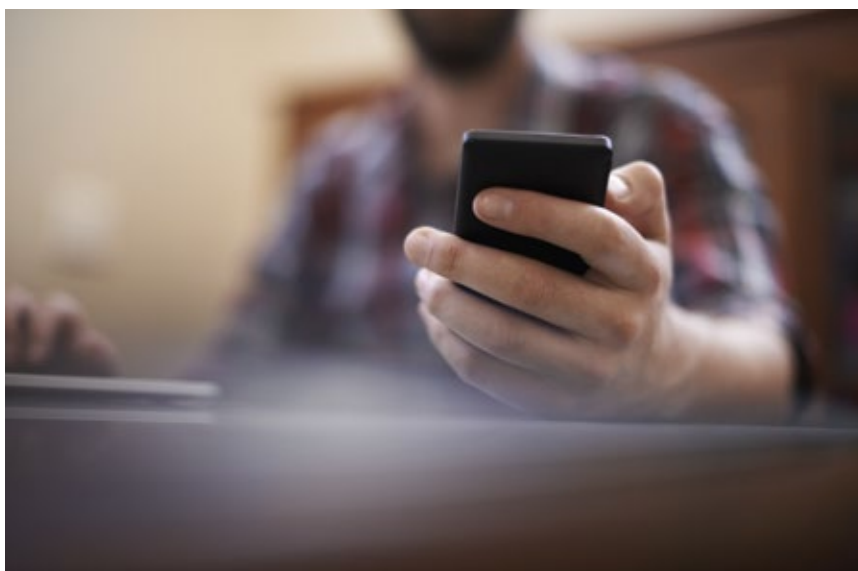
5.2.3 Big data and behavioural analytics come to security

Enterprises, network operators and security technology vendors are increasingly using big data techniques and behavioural analytics in their fight to prevent or detect intrusions and security compromises. This intelligence is being integrated into advanced networks, allowing them to detect and block or deflect compromises, which greatly reduces their impact.

Denials of service (DoS) attacks are already a significant problem at both a network and an application level. As enterprises integrate even more distributed and cloud-based services the impact of DoS attacks only becomes worse. New generations of denial of service prevention (DoSP) and application denial of service prevention (ADoSP) tools analyse large amounts of traffic to look for the behavioural signatures of known attacks. Increasingly, machine learning is being harnessed to detect changing patterns that may indicate new forms of attack. Anomalous traffic flows can then be routed to 'scrubbing centres' where offending traffic is removed to protect ongoing connectivity even before humans are aware of the new form of attack.

Machine learning and behavioural analytics are not limited to preventing denial of service. Endpoint protection often now includes behavioural analytics – looking for signs that a system is being used in an unexpected way or that a user is exhibiting behaviour that warrants further examination. Security analytics engines sit across enterprise systems to look for unusual workflow patterns. Web appliances learn the common usage and browsing patterns of individual users and the signatures of individual applications (even if traffic is encrypted) and can detect deviations from these patterns that warrant further investigation.

### 5.2.4 Blockchain and Distributed Ledgers

One of the most interesting cyber-trust technologies is Blockchain. A Blockchain is a distributed ledger (or database) of digital information shared between multiple parties. Figure 35 describes how basic Blockchains work.

The ability of Blockchain to provide irrefutable real-time validation of data flows, transaction chains and chains of custody has piqued the interest of the financial services sector. There are numerous Blockchain-centric fintech start-ups such as Ripple (who focus on global financial settlement in near real time) that are utilising distributed ledger technology for fast exchange of financial information.

Perhaps the most famous (or infamous) application of Blockchain is for cyber-currencies such as bitcoin. However, a huge variety of use cases are being actively explored for Blockchain technologies, including non-repudiation, configuration verification, supply chain mapping and tracking, document signing, etc. Blockchain technology is the subject of massive amounts of hype – much of it suggesting it will completely revolutionise financial systems. The reality is more likely to be that Blockchain technology will be a very valuable technology for removing significant amounts of friction from a wide range of existing financial and non-financial applications.

bitcoin is an example of a public Blockchain where anyone can read or write transactions. However for most financial applications confidentiality is critical. Not only do we need to restrict who can read and/or write to ledger, we need to restrict who can read or write to particular parts of the ledger at particular points in a transaction flow. The Software-defined Networks (SDN) described in section 5.1.1 give institutions the ability to tightly control access to particular Blockchains at any given time. In a sense, SDN can be a fundamental enabler of Blockchain-ready networks.

Figure 35: Blockchain

| Block 1 | Block 2 | Block 3 |
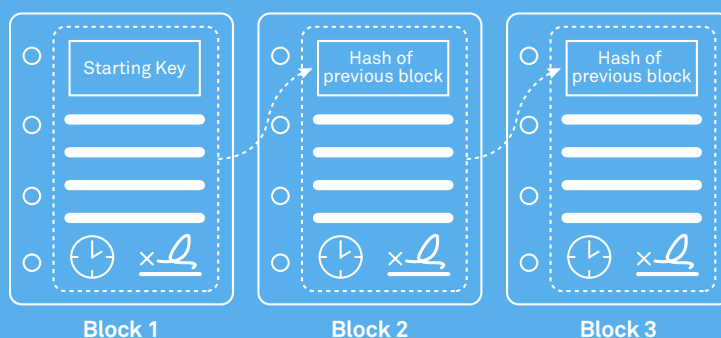
At the heart of the Blockchain is a cryptographic hash. Think of the hash as a function that generates a summary of a piece of information with the special properties that:

a) it is computationally easy to calculate the hash of a piece of data; and

b) it is computationally very difficult to construct a piece of information with a given hash.

Think of the Blockchain ledger as a book. We start by writing a key at the top of the first page. To record new data, we write our data, sign and timestamp it and then write the hash of the current page at the top of the next page. We also make sure copies of the ledger are regularly shared with others and that any discrepancies between the copies are resolved by a well-defined consensus process. This provides a digital ledger where:

- data can't be deleted without detection;
- we have a reliable chronology of what data was added, when and by whom;
- tampering with any part of the Blockchain is detectable;
- it is computationally difficult to create fake ledgers or entries; and
- you can't 'go back in time'.

Blockchains can be publicly readable and writable, publicly readable and privately writable or privately readable and writable.

Of course there are other tools that can help ensure data integrity, with public key infrastructure (PKI) perhaps the most prominent. However, PKI is not well suited to all data integrity use cases. The key management required for secure PKI is a complex and specialised field involving certificate authorities, key storage, revocation and reissuance, etc., all of which must be carefully implemented and managed. There is also a risk that if the underlying encryption scheme is broken, all certificates must be reissued at significant operational impact and the integrity of all historical data signed using that scheme cannot be verified. This is a significant concern given efforts to harness quantum computing techniques to crack common PKI encryption schemes[31]. In an IoT context, confidentiality of data is often less important than ensuring integrity of data. While certificate-based PKI can help ensure integrity, many IoT devices simply lack the computational resources to perform the required cryptography. Blockchains can ensure integrity while requiring much less computing horsepower.

**Scenario 2:
Saving for a dream**

For a significant birthday, Skylar is planning for the holiday of a lifetime and uses the MySavingsGoal service. Skylar sets up some basic parameters such as her risk appetite and requirement for availability.

As her nest egg grows, MySavingsGoal continuously analyses the performance of her savings and redistributes her investment based on bids from wealth and investment managers, automated investment services, bond markets, etc. The service optimises her return within the parameters Skylar has set and, of course, she can see her position in real time at any time.

Behind the scenes, MySavingsGoal manages a complex and evolving set of bids, contracts, agreements, reports investment and returns with third-party providers on Skylar's behalf. Every one of these is certified and recorded in real time using MySavingsGoal's Blockchain.

**Scenario 3:
Joanna buys a house part 2**

Recall scenario 1 where HouseFly helped Joanna find a loan from FinCo to buy a house. Let's have a look behind the scenes.

First, every aspect of the micro-auction HouseFly conducted for Joanna's loan was recorded in a Blockchain, including Joanna's initial agreement with HouseFly, the background data she provided, the results of the analysis and verification HouseFly conducted, the terms of the auction, the individual finance offers and their terms all the way to Joanna's ultimate agreement and FinCo's fulfilment.

Second, every request for instantiation of each required microservice or network link was recorded in a Blockchain as is fulfilment. Since the content of Joanna's chat was a key part of her decision-making process, the video call and its contents are also recorded in the HouseFly Blockchain.
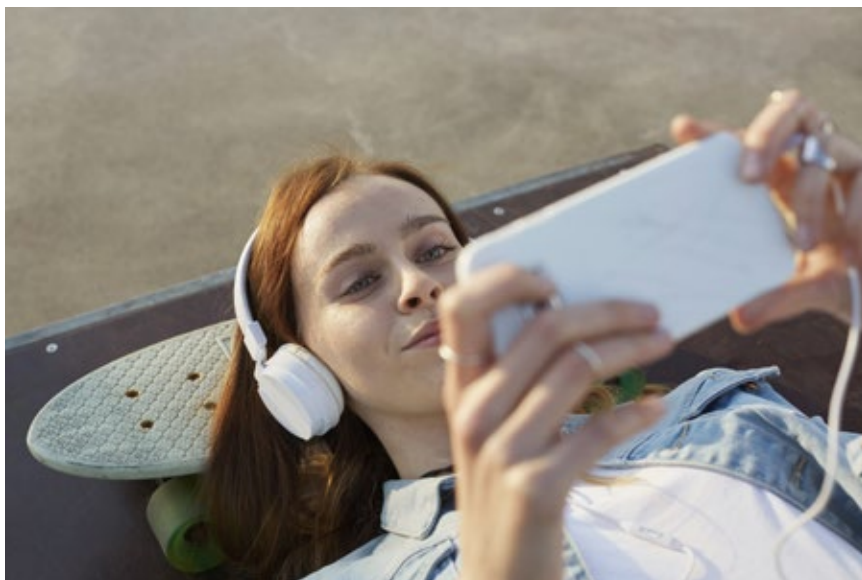
5.3 The Internet of things (IoT)

The past ten years have seen an explosion in the number of devices that are, in some way, network connected. Not all of these are generally considered part of IoT. Definitions of 'things' vary widely, but can be summarised as:

IoT devices are sensors and actuators, or collections of them, embedded in physical objects and in some way network-connected to computing systems that monitor or control connected objects and machines, the natural world, people and animals.

Most sources estimate that there are between 7 to 10 billion installed IoT devices today. Forecasts for 2020 vary widely: Gartner predict 20.8 billion connected devices by 2020[32], Ericsson predicts 26 billion[33] and Cisco predicts 50 billion[34]. Regardless of which forecast is more accurate, we're clearly witnessing an explosion in our ability to measure and interact with the physical world. IoT promises unprecedented visibility into people, the physical world they occupy and the interaction between the two. Connected cars equipped with hundreds of sensors tell us about drivers, vehicles and roads. Connected homes tell us about people's home lifestyle, energy use,

activity and more. Intelligent stores provide data on shopping habits.

We already know that customer intent and customer context are fundamental to service delivery and greater personalisation. IoT can play a role in inferring intent and context. Is a customer stationary or on the road? Are they stressed at the moment – or even ill? Have they just had an automobile accident?

Much development is focused on reducing the size, cost and power requirements of IoT devices. The sensors attached to them are also evolving rapidly. There is great focus on microelectromechanical systems (MEMS), where microscopic sensors and even arrays of many sensors can be created on integrated circuit substrate. Some producers claim to be able to discriminate millions of different chemicals with a single array. Others are working towards devices that identify every virus a person has ever been exposed to by analysing the antibodies in a single drop of blood.

One of the major unresolved issues in IoT is security. IoT is premised on a huge distributed population of diverse connected devices. Like any IT, security flaws in devices do occur. So it is essential that:

- devices are actively monitored, and;

- affected devices are rapidly updated. The huge 'attack surface' for IoT makes effective device management platforms a critical first line of defence. We'll look at some approaches to security in an IoT world later in this report.

The data from the IoT will typically be accessed via gateways and aggregators such as smartphone manufacturers, vehicle manufacturers, health service providers, telcos, appliance makers and many more. Successful financial institutions will require the ability to develop the right partnerships to source the right IoT data at the right granularity and with the right timeliness to better service their customers. However, IoT data is not, of itself, necessarily valuable. It is often only when IoT data is combined with advanced analytical techniques that valuable insights can be unlocked.

So advancements in technology provide highly flexible digital platforms, new techniques to secure them and a vast amount of data regarding our customers and their environment. We need to understand how to use this data to customise these services, ultimately for each customer's personalised lifestyle. It is time to look at some of the technological changes which are enabling that level of personalisation, artificial intelligence, big data and the analytics-driven business.

5.4 Big data, analytics-driven business and artificial intelligence

Financial institutions have traditionally been data-driven organisations. Two things have radically changed. First the volume and variety of data available has exploded. IDC estimates that enterprise data doubles every 18 months[35] and most of that data is unstructured. On the one hand customer intelligence streams in from always-connected consumers and the social web and on the other, market data, risk data, climate data and economic forecasts are endlessly available. Meanwhile, IoT devices stream data about almost any aspect of the physical world.

Second, a generation of consumers has been trained by their online experiences to expect that this data will be used effectively to support their lifestyle processes and to remove friction from their lives. They expect their providers to understand their identity, their intentions and their preferences and to use that knowledge to deliver services as seamlessly as possible.
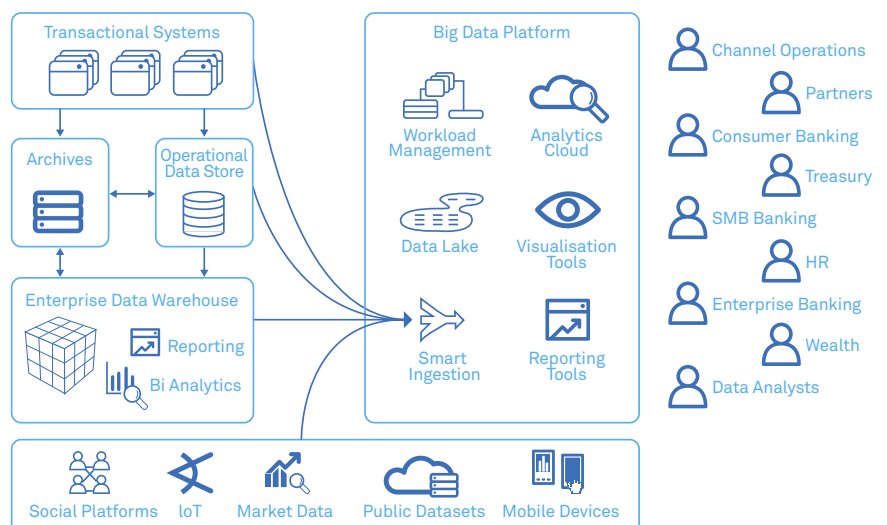
The response has been the rise of big data and analytics-driven business – often simply lumped under the label big data. **It is critical to understand that big data is not primarily about processing huge amounts of data. It is about more effectively using all of the data available (whether structured or unstructured, internal or external) in an extremely agile way to produce actionable insights.**

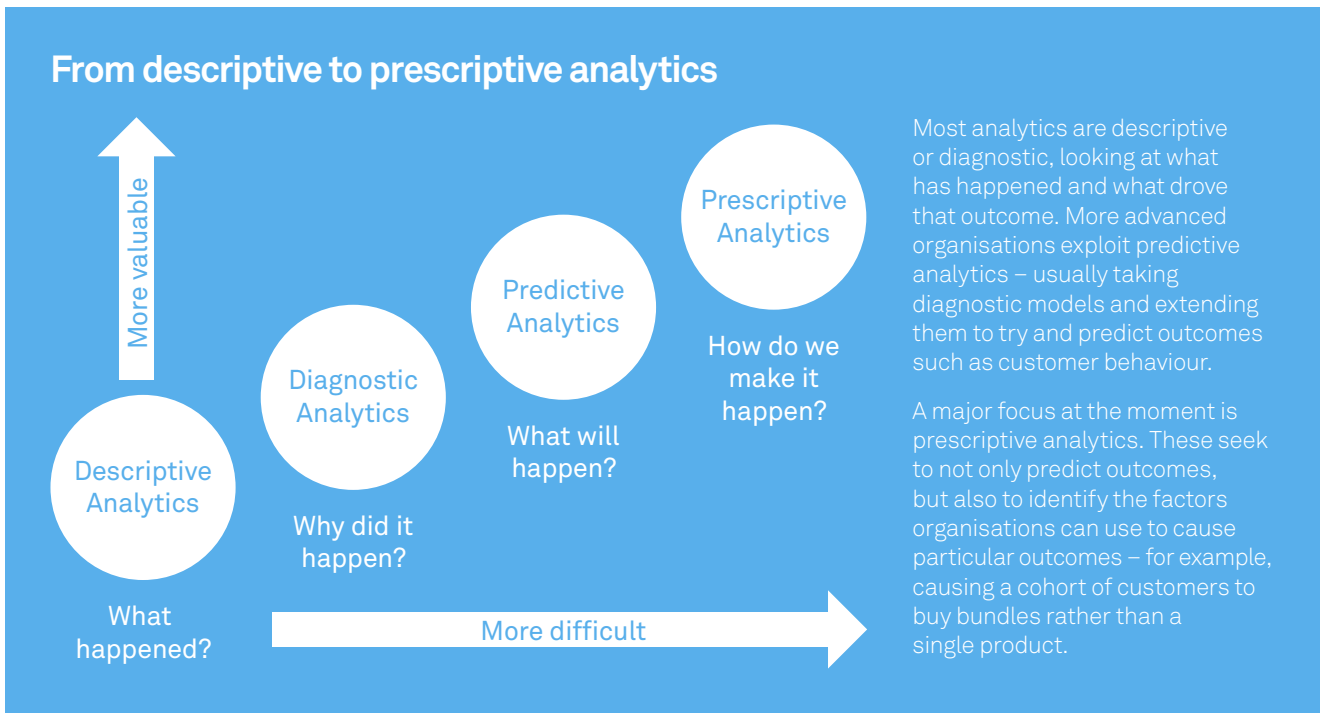## Figure 36: Traditional analytics architecture
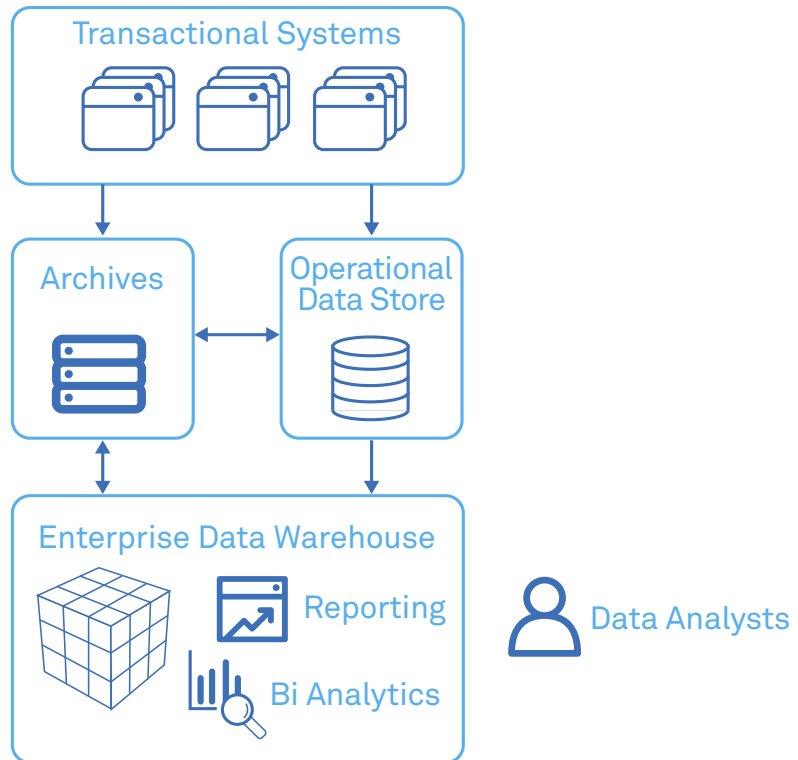
Source: Telstra Research 2016

Figure 37: Big data analytics architecture

Source: Telstra Research 2016

From descriptive to prescriptive analytics

More valuable →

Descriptive Analytics
What happened?

Diagnostic Analytics
Why did it happen?

Predictive Analytics
What will happen?

Prescriptive Analytics
How do we make it happen?

More difficult →

Most analytics are descriptive or diagnostic, looking at what has happened and what drove that outcome. More advanced organisations exploit predictive analytics – usually taking diagnostic models and extending them to try and predict outcomes such as customer behaviour.

A major focus at the moment is prescriptive analytics. These seek to not only predict outcomes, but also to identify the factors organisations can use to cause particular outcomes – for example, causing a cohort of customers to buy bundles rather than a single product.

The big data and analytics movements (which are really two sides of the same coin) are about democratising both access to data and a way to perform relevant analytics on it. As Figure 36 and 37 depict, big data analytics typically gives a broad audience the ability to conduct exploratory analytics. It frees analytics from the data warehouse; it provides business analysts from all parts of the business with access to data and highly usable analytical tools to conduct explorations that were previously restricted to a few data analysts buried away in an enterprise data warehouse. Big data enables institutions to experiment with new analyses rapidly and cheaply and makes it easier to operationalise the insights.

Some of the most exciting developments in the last decade have been in an area called machine learning. Traditionally one of the most problematic aspects of analytics has been building models. Usually analysts look for artefacts in data and postulate models that are then tested against known data and refined. Data sets are now so complex that it is often impossible for humans to identify artefacts, let alone correlate them with potential driving factors. Machine learning is a discipline about algorithms that actually generate models directly from data (either with or without human supervision). These models can then be used to make predictions (predictive analytics) or to inform decision-making. Machine learning is playing a large part in driving a shift in focus away from descriptive analytics to predictive and even prescriptive analytics.

Deep learning

Deep learning is a branch of machine learning that involves layering various different machine learning approaches in complex ways. In some fields such as image recognition, deep learning is now considered to outperform a well-trained human. Deep learning is being explored for many applications - for example choosing the marketing actions most likely to maximise a customer's lifetime value[36].

Scenario 4 shows a hypothetical example of how IoT, big data and advanced analytics come together to inform one of the most basic business decisions – what is the right product or product construct to offer a given customer in a given situation. The scenario also shows how, given flexible service orchestration, analytics can be used to assemble services and service components in the right way to service a given customer.

**Scenario 4:
Mark buys a car**

Mark is buying a car. He's used the AutoCzar app to talk to other car enthusiasts, research the car and to find a great deal on his dream car. As he's talking to the dealer following a test drive Mark gets an AutoCzar alert offering finance. He takes a picture of the car's VIN plate and within seconds he has several offers, including a great finance/insurance bundle that is way cheaper than the dealer's finance offer. Mark swipes his finger across the phone's fingerprint reader to accept the deal.

Behind the scenes, using Mark's location data, AutoCzar surmised he had just returned to the caryard following a test drive and triggered the offer. Once Mark snapped the VIN plate a range of lenders were engaged, each tailoring offers based on Mark's financial history, reputation and the sentiment of his posts to AutoCzar. One provider identified that Mark had bundles for his utilities and communication needs, so they went to the insurance spot-market where insurers can do real-time underwriting based on Mark's driving style as well as the dealer's reputation, the car's history and its current health.

We've mentioned how Millennials demand financial service providers treat them as true valued partners – providing them with quality financial advice and doing so in real time. We've also demonstrated that a significant number of Millennials feel their financial service providers are failing to do that. An interesting response has been the rise of artificial intelligence – based tools such as robo-advisers and intelligent virtual assistants.

Robo-advisers are essentially software that uses algorithmic analysis of market data etc. and customer preferences and profiles to automatically generate financial advice. The techniques used to power robo-advisers can range from very simplistic alerting based on predefined threshold logic to highly advanced machine learning that adaptively reacts to new market patterns and to changing customer behaviour and context. Highly intelligent robo-advisers offer financial service providers the potential to provide customised high-quality advice at a mass-market scale.

However, good quality, timely advice is not necessarily sufficient to create the true sense of partnership Millennials demand. There are signs that consumers can form quite deep functional relationships with intelligent virtual assistants (IVA).

This is software, usually accessed via a mobile device, which employs:

- awareness of personal context;

- deep insights into customer behaviours and intentions enabled by predictive analytics;

- access to a rich array of software-controllable services; and

- a highly engaging natural language interface, often including a speech interface.

An IVA is always present and, because it is familiar with your activities and behaviours, is always working to meet and anticipate those needs. Financial service providers can use specialised finance-centric IVAs to deepen their relationship with customers and can also provide financial services consumed through general purpose IVAs such as Apple's Siri or Google Now.

For more information about IVAs, automated advice and the technologies underpinning them, see our previous report 'Analyse This, Predict That – How Institutions Compete and Win with Data Analytics'[37].

6.0 CONCLUSION

Millennials matter. They have become lead indicators of disruption in financial services. They have matured and are exerting their economic strength, social influence and political power. They are at the forefront of the battle for customer relationships, employees, investors and policy makers. According to McKinsey, "Banks can take the battle for the customer – the defining dynamic of the next ten years – to the upstarts, by mastering the customer relationship, creating an emotional connection and leveraging their data treasure to deliver a superior customer experience"[38]. The alternative option they propose is to share their critical assets with others for resale or value-add. Irrespective of which approach an institution chooses to pursue, only by reimagining the customer experience (and relationship) with Millennials and digitising their core business, will institutions be able to transform to maintain relevance.

Finance of the future will likely be seamlessly embodied within our lifestyles, increasingly consumed through mobile applications delivered by distributed autonomous institutions. Our research highlights that to Millennials, we simply can't advertise our way into their attention – just because they're always connected, doesn't mean they're listening. Their personal lifestyle aspirations and financial needs are inextricably fused by digital mobile technology. Institutions have developed a massive amount of 'trust capital' that can be leveraged to create the valued relationships desired by one in two Millennials, particularly the affluent ones, who are more responsive to digital advice, personalisation and disruptive offers from non-traditional providers.

Business models with the greatest disruptive impact are platform based, data intensive and capital light and will target profit pools that have the greatest friction. The platformification of institutions will require them to operate differently, and digitally. Collaboration (fintegration) between traditional and non-traditional players will create new ecosystems that unlock value through re-bundling.

This will be enabled by capabilities that include:

1. **Software-defined cloud networks** that can be reconfigured in real time by applications to dynamically provide the required features and access.

2. **Analytical platforms** that provide access to data and tools so institutions can quickly gain new insights into the customer and turn them into operational actions.

3. **Cybersecurity and identity platforms** that protect highly distributed composite services, personal data and that can evolve to address new and emerging threats for both Millennials and institutions.

4. **Digital platforms** that reduce the cost, time and complexity of building, deploying and maintaining applications. They also allow institutions to expose data and services to ecosystem partners in a manageable but highly usable way.

The prize for executing these capabilities well is a smarter, faster, agile, more efficient, convenient and relevant institution that is well positioned to adapt to the changing risk profile of the industry. We call this the anatomy of next generation, distributed, autonomous digital financial services.

"Banking is about identifying and mitigating risk… innovation is about taking risk. The challenge for us is to figure out how to support both of those cultures in the same place," said Shayne Elliott, the CEO of ANZ[39].

In my first report on Millennials in 2009 (pre-fintech), I outlined how "this generation's dreams have been shaped by their life circumstances and if institutions want to serve them better, they will need to listen very carefully to what Millennials have to say – otherwise this generation won't pay attention to them. If institutions want to reach them, they need to understand technology as the Millennials do".

Since then, a tsunami of research continues to demonstrate that financial institutions to date have not emotionally connected with this demographic – their technology focus has been primarily transactional. But Millennials are tribal and they value lifestyle experiences and sharing experiences with each other. How do you deal with a world – a family, a workplace, a culture and a technology – that keeps changing? You keep your options open, which is precisely how this generation is approaching financial services and why they have an unquenchable thirst for fintech. Making that connection is worth the effort, as Millennials are fiercely loyal to brands they love – and they tell the world about it. These principles have never been more relevant than today.

I hope these insights help your institution's journey to success.

FOR MORE INFORMATION

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Rocky Scopelliti is the Global Financial Services Industry Executive at Telstra Global Enterprise Services. He is Telstra's thought leader in banking, finance and 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.

A distinguished author and international speaker, Rocky has produced 11 thought leadership research reports that have become widely recognised for their contribution to the development of digital financial services. 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 white paper

- The Digital Investor – How Changing Demographics and Digital Technologies are Impacting the Wealth Management Market

- Analyse This, Predict That – How Institutions Compete and Win with Data Analytics

- Mobile Identity – The Fusion of Financial Services, Mobility and Identity

- Millennials, Mobiles and Money – The Forces Reinventing Financial Services

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8.0 ACKNOWLEDGEMENTS

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Warren has Honours Degrees in science and engineering from Monash University and a Masters Degree in Electronic Commerce from Deakin University.

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About Near

Near is a leading location intelligence platform providing real-time information on places, people and products. The Near platform powers Allspark, its flagship product enabling customers to visualise, engage and analyse audience data including their location and behaviour for data-driven decisions.

Founded in 2012, Near is headquartered in Singapore with a presence across Australia, South East Asia, Japan and Europe. To date, the company has more than 700 million profiled audiences and has put it to work for marquee brands including P&G, Coca Cola, Ikea, Audi, McDonald's, Toyota, Nike and Samsung.

Near is backed by investments from leading venture capitalists Sequoia Capital, JP Morgan Private Equity Group, Telstra Ventures and Global Brain Japan.

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