



School of Information Technologies
Faculty of Engineering & IT

ASSIGNMENT/PROJECT COVERSHEET - GROUP ASSESSMENT

Unit of Study: INFO6012 Information Technology Strategy and Value

Assignment name: Digital strategies of the Australian banking industry

Tutorial time: 8 p.m.-9 p.m. Tutor name: Manish Shetty

DECLARATION

We the undersigned declare that we have read and understood the [University of Sydney Academic Dishonesty and Plagiarism in Coursework Policy](#), and, except where specifically acknowledged, the work contained in this assignment/project is our own work, and has not been copied from other sources or been previously submitted for award or assessment.

We understand that failure to comply with the *Academic Dishonesty and Plagiarism in Coursework Policy* can lead to severe penalties as outlined under Chapter 8 of the *University of Sydney By-Law 1999* (as amended). These penalties may be imposed in cases where any significant portion of my submitted work has been copied without proper acknowledgement from other sources, including published works, the internet, existing programs, the work of other students, or work previously submitted for other awards or assessments.

We realise that we may be asked to identify those portions of the work contributed by each of us and required to demonstrate our individual knowledge of the relevant material by answering oral questions or by undertaking supplementary work, either written or in the laboratory, in order to arrive at the final assessment mark.

Project team members				
Student name	Student ID	Participated	Agree to share	Signature
1. Xuanyi Guo	470217337	<input checked="" type="checkbox"/> Yes / No	<input checked="" type="checkbox"/> Yes / No	郭宣毅
2. Lingzuo Zhao	470374652	<input checked="" type="checkbox"/> Yes / No	<input checked="" type="checkbox"/> Yes / No	赵玲佐
3. Tianze He	470285048	<input checked="" type="checkbox"/> Yes / No	<input checked="" type="checkbox"/> Yes / No	何天泽
4. Goutham balasubramanian	460480015	<input checked="" type="checkbox"/> Yes / No	<input checked="" type="checkbox"/> Yes / No	Goutham
5. Mengqi Yu	470069552	<input checked="" type="checkbox"/> Yes / No	<input checked="" type="checkbox"/> Yes / No	余梦琪
6.		Yes / No	Yes / No	
7.		Yes / No	Yes / No	
8.		Yes / No	Yes / No	
9.		Yes / No	Yes / No	
10.		Yes / No	Yes / No	

Content

1. General introduction to the Australian banking industry	2
2. Description of the competitive landscape of the industry	2
3. The Major Digital Strategies of Four Major Banks	5
4. The Key Implications and Business Value Propositions	12
5. A Comparative Analysis of Digital Business Strategies	14
6. Conclusion	17
7. References	18

1. General introduction to the Australian banking industry

In Australian banking industry, there are four largest retail banks, Commonwealth Bank of Australia (CBA), Westpac Banking Corporation (Westpac), Australia and New Zealand Banking Group (ANZ), and National Australia Bank (NAB) which play dominated roles.

The total market share occupied by the four major banks are beyond 75%, and Westpac, CBA, NAB and ANZ takes 23%, 21%, 19% and 16% respectively. There are several smaller banks and foreign banks, but no bank among them accounts for higher than 2.5% in terms of market share. Please refer to the following figure.

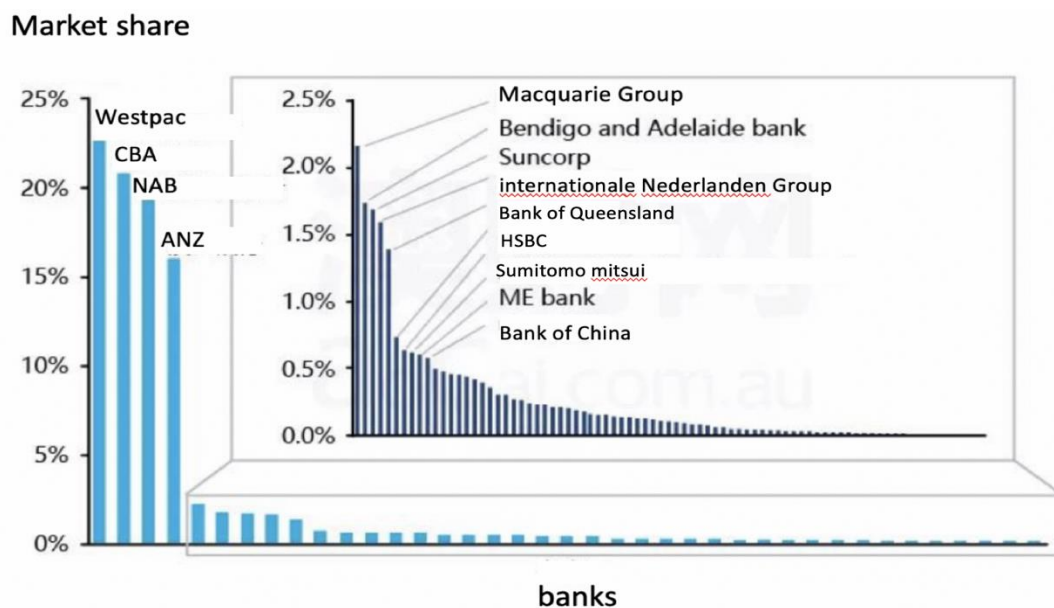


Figure 1 market share in Australian banking industry

According to a report from Ernst & Young Global Limited 80% of Australian bank and 85% international bank put the digital transformation as a priority, and they make large investment on technology to improve efficiency, increase business growth and respond to risks. And the digital transformation is viewed as the key to sustainable success.

2. Description of the competitive landscape of the industry

Statistics show that this is a digital age. For example, up to June 30, 2012, the number of Internet users has exceeded 2.4 billion. A survey conducted by the Pew Research Centre in August and September 2012 showed: Nearly half of American adults (45%) and two-thirds of young people (66%) show that they have a smartphone.

For any companies or organizations, opportunities and challenges coexist. It depends on their own perspective and the relationship with the landscape of the industry. To keep the information value in the rapidly expanding digital era, implementing a strategy to participate in the most effective way is a must (Atherton, M. ,2015). Many companies or organizations

have already developed digital strategies as part of their overall business strategy or as a complement to their overall business strategy to evaluate and ultimately better promote this trend. For banks in Australia, they are also working to find new possibilities offered by digital technology so that they can raise their competitive position in the market. Digital business strategy evolves digital devices, technologies and user expectations, among which the core of the digital business strategy is the user experience, so in the strategy, it must be stipulated how to most effectively adapt to the ever-changing digital experience needs stimulated by this development.

Digital disruption continues existing and various new organizations will eventually push the innovation of the whole landscape of the industry. Providing more personalized products, user experience and high-level convenience can obtain a stable status in the industry. Some new digital bank, like PayPal and Venmo have specialized online and mobile delivery service, while traditional bank tends to hierarchical mobile and online capabilities with physical operation. Banks that Develop digital and data can fundamentally simplify their ability and then raise the satisfaction with customers experience. There are more interruptions and Fintech begin to weaken the traditional bank business, including lending, payment and personal wealth management. Generally, they offer faster service, cheaper products and better customer experience. Major banks are increasing investment in digital innovation, like encouraging customers transferring to online and mobile self-service. (Teller Visio, 2016). These two kinds of banks are two ends of the continuum and each of them are closing to the center. For digital bank, they need to focus on their security and regulatory compliance. For physical bank, they have to get rid of the entirely physical adoption instead of blending digital innovation into their business core. With the development of these two natures banks, there will be a narrow dichotomy and future bank would come into being. (Atherton, M., 2015). I believe that is what these four major banks seeking for now.

According to Business editor Peter Ryan (2015), Australia successfully avoided the severe risk in the global financial crisis because four major Australia banks, NAB, Commonwealth, ANZ, and Westpac, are AA level. However, Australia bank could have an underlying threat in the perspective of lending businesses. With the peer-to-peer lending breaking out, borrowers and lenders matching online have already developed into latest front in the digital disruption. Chau's report (2018) said in the year 2018 to date, the share market for CBA, Westpac, ANZ and NAB have been sharply losses -11.8pc, -4.8pc, -1.3pc and -3.7pc respectively. The risk of

credit is severe. Therefore, a British lender has just established a branch in Australia in order to figure out the problem of credit trust in traditional banks.

Digital business strategy is different from traditional business strategy at least in the following four perspectives. Firstly, the uncertain growth of digital. Digital business strategy will use uncertain digital as advantage to help bank manage the negative factor. Secondly, more focus on new game compared with current industrial competitive position. Thirdly, continually new resources as competitive position. Fourthly, seeking several goals at the same time. Generally, it needs large investment on IT infrastructure to find more flexible strategy. Therefore, IT explores new possibilities and makes bank have more opportunities in the combination between traditional business and newly digital business. (Mithas, Agarwal and Courtney, 2012).

There are five areas in banks facing serious challenges: world technology and digital development, politics and regulation, transition economies, the impact of environmental change on customers and the impact of demographic changes as a result of the retirement of the big baby boomer generation.

Australian banks are facing avalanche technology changes brought about by an increasingly intelligent automation society, and social income inequality will become more serious, limiting the bank loan market and increasing risks.

The four major banks have lost their trust, and banks have been widely criticized for layoffs and social impacts, and their credibility may be further eroded.

New technologies will significantly reduce the bank's cost base. The number of staffs in most banks will be reduced by at least 25%, and in some cases, the number of layoffs will be even greater. But new technologies will also make it easier for new participants to enter certain areas of the industry. Therefore, there will be greater competition, which will make it difficult for banks to maintain current profit margins. In addition, in order to keep up with the banking technology revolution, banks need to increase their investment while their profits are not rising.

The four major banks in Australia still takes up the leading role. Even though there are some competitive in other financial field, these major banks pay more attention on raising customer standard and keep the price of product or service to maintain their leading role in the industry. (Sikora, 2001).

3. The Major Digital Strategies of Four Major Banks

3.1 NAB

A 159-year-old bank makes NAB one of the oldest banks in Australia. NAB started as a small bank serving the goldfields of Victoria with a handful of employees to a situation where they currently employed 30,000 people or more. NAB has evolved itself digitally to benefit its customers and own growth in banking sector. In this period of digital transformation NAB has doubled its number of user login via mobile application with their entire user falling within age group of 18-55 years old Australians (Bennett, 2017).

Internet banking was first launched in 1999, but currently they have a team of 200 cyber security employees as a team (Bennett, 2017). NAB's first technology move was to announce their establishment multi product class portal which initially comprised of exchange of foreign exchange (FX) instruments. (Elliot, 2006). In the year 2008 NAB decided to team up with Oracle to modernize its Information Technology (IT) by investing \$30 million. This was to build a new core banking system one of the first steps in new core banking system (Tung, 2008). NAB in 2016 rolled out personal banking platform which could reduce the number of clicks to complete a loan application from 250 to 50 which was considered to be a massive move in the history of banking according to NAB (Palmer, 2016).

With the growth, NAB has been continuously made it a habit to meet customer requirements and have been providing through their technological advancements such as "NAB connect" which is an internet banking solution for on the go, home or for business purpose. NAB has already been using FinTech 2.0 which is Internet Financing but innovations in this domain have been increasingly difficult over the years within the banking industry. In late 2016, a discovery of block chain technology with FinTech was set to revolutionize banking business. With a test of using the block chain platform NAB could transfer a small amount with 10 seconds between 2 different customer accounts using Ripple's ledger technology (Ye Guo, 2016). Below is the table that explains the use of block chain and its benefits:

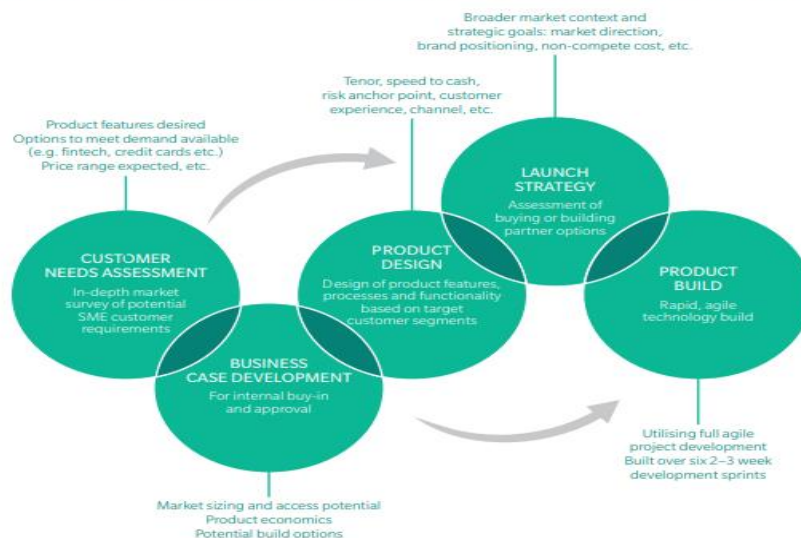
Comparison of traditional banking businesses, Internet finance businesses, and blockchain + banking businesses			
	Traditional banking businesses	Internet finance businesses (FinTech 1.0)	Blockchain + banks (FinTech 2.0)
Customer experience	Uniform scenarios	Rich scenarios	Rich scenarios
	Homogenous service	Personalized service	Personalized service
	Poor customer experience	Good customer experience	Good customer experience
Efficiency	Many intermediate links	Many intermediate links	Point-to-point transmission, disintermediation
	Complex clearing process	Complex clearing process	Distributed ledger, transaction = clearing
	Low efficiency	Low efficiency	High efficiency
Cost	Large amount of manual inspection	Small amount of manual inspection	Completely automated
	Many intermediate links	Many intermediate links	Disintermediation
	High costs	High costs	Low costs
Safety	Centralized data storage	Centralized data storage	Distributed data storage
	Can be tampered	Can be tampered	Cannot be tampered
	Easy to leak users' personal information	Easy to leak users' personal information	Use of asymmetric encryption, Users' personal information is more secure
	Poor safety	Poor safety	Good safety

Figure1: Block chain + banks (Fin Tech 2.0)

Source: (Ye Guo, 2016)

2017 saw NAB develop a solution called as NAB Quickbiz Loan. This platform uses dynamic cash flow credit model which lets it handle higher limits of business loans within 60 seconds to process and maximum 3 days pay out funds (IESE, 2017). All this was done by design thinking experts.

Exhibit 10: Overview of the application of Design Thinking during the project with NAB Bank



Figur2: Design thinking for a NAB project work

Source: (IESE, 2017)

For the future the current updated strategy is that, NAB is looking to recruit 600 new people into core areas such as DevOps, Engineering, Architecture, Security, UX and Data. Other technological improvements are the “Mini NABs”, working end-to-end from the design of the customer experience to landing that experience in to the hands of our customers. Finally NAB uses Net Promoter System using which customer performance is measured which allows bankers to near real-time customer feedback (Bennett, 2017).

In 2011, NAB entered into infrastructure, telecommunications, core banking and enterprise software deals with IBM, Telstra, Oracle and SAP respectively. IBM is the major contributor who held responsible for a major IT infrastructure and Outsourcing and deliver new products. This was a role played by NAB with outsourcing their IT infrastructure (Tay, 2011).

Under the contract IBM acquired NAB’s existing computing infrastructure within NAB’s Australian data centers’ and assumed responsibility for the associated software licenses (Corrs, 2018).

3.2 Westpac

Westpac is one among big 4 banks whose majority of income is from national and regional commercial banks in Australian industry (Westpac Banking Corporation, 2017). In 2014 during an open challenge competition an app was built by Westpac which uses augmented reality using the phones camera to scan a customer’s credit or debit to produce the expenditures on travel, utilities or food. It would also provide a summary of loyalty points, the days left to pay your bills. This is an additional feature to the online banking toolbox (Timson, 2014). They were continuously looking for improvement March 2017 saw Westpac rollout 100 new online features one among that was end-to-end digital personal loan experience and they saw a growth of 25% increase in number of electronic statements downloaded. Their digital strategy was to provide users convenience and hit a profitable business (Pearce, 2017).

Focus on improvement was narrowed down to unique customer set, on November 2017 Westpac completed its first live home loans to simplify the end-to-end home loan experience for customers. The largest transformation program used by Westpac “Customer Service Hub” is responsible for actions to smoothen the relationship between consumers and the bankers, an important digital strategy moves to simplify, standardize and digitize with their customers (Bennet, 2017).

In 2018 January Westpac had provided user with a technology to access banking services while texting their contacts (Connolly, 2018) as shown in the above image. Also in 2018 Westpac took customer issues for a serious concern and used digital technology to provide something called as “Bank Now” which is a 24/7 self-service lobbies, iPads, digital marketing, video conferencing, Wi-Fi, touch screens and teller cash recyclers in their branches. This was a strategy implementation after the complaints of customer that individuals are not available during the functioning times of the bank. So they implemented new timings for their customer concerns using digital technology (Westpac, 2018).

Westpac bank outsourcing providers in IT infrastructure and Technological advancements are Accenture, Infosys, Genpact and IBM. Services that are offered in this area by the companies involved include workforce administration, payroll functions, benefits administration and lot of technology systems and all IT related advanced technologies and strategies to manage and analyze employee data (Smith, 2014).

3.3 Commonwealth Bank

20 years ago, Commonwealth bank launched NetBank and from then Commbank’s digital transformation grew from there. In 1997 Commonwealth bank with its launch of net banking was one of the first banking institutions in Australia to connect to cyber-banking. In the year 1999 NetBank was available to its entire customer irrespective of the location they would access it from.

3.3.1 Implementing Strategies

All the technological advancements for Commonwealth bank were focused on its net banking services in recent years. Upgrades to the NetBank services with implementation of international money transfers, real time transactions and NetBank email alerts for first time transactions were implemented in 2005. March 2007 Commonwealth Bank offered customers with Security improvements for NetBank providing two factor authentications. Bank provided the customers with the login credentials to access the account and SMS consisting of an encrypting code will be provided to the customers as a second step of verification. Log with it net code SMS which is a technology that provides security codes verifying online transactions via SMS messages as an example provided in fig 1. In 2010 Web chat for assisting customers was launched as trial which later became a permanent service of Commonwealth bank and NetBank services. Intelligent Deposit machines were installed and by mid 2013 transactions reached 1 million

deposits since rollout. In 2017, a technology to communicate over Skype to a lender was started first bank to provide opportunity for customers to talk with expert lenders from their phone, computer or tablet device.

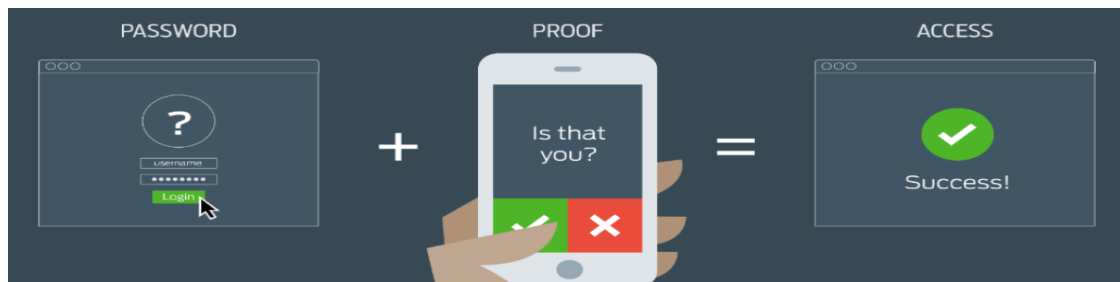


Figure 4: Two-Factor Authentication (Garispe, 2017)

Source: Garispe, J. (2017, August 4). *Multi-Factor Authentication as a Best Practice*. Retrieved from Akins IT: <https://www.akinsit.com/multi-factor-authentication-best-practice/>

The key goal was to improvise their platform in which business was run. Current statistics show 53 % of Commonwealth banks business transaction are digital (Cleeland-Mellor, 2017). The perks of such digital development is to figure out 3 trillion NetBank transactions since 2010, 75% logins into NetBank is through mobile device, quarter of new accounts are being opened online and CBA has 5.8 million customers using its digital platform (Cleeland-Mellor, 2017). These were only implemented by a proper digital strategy that focused the long run of the banking organization.

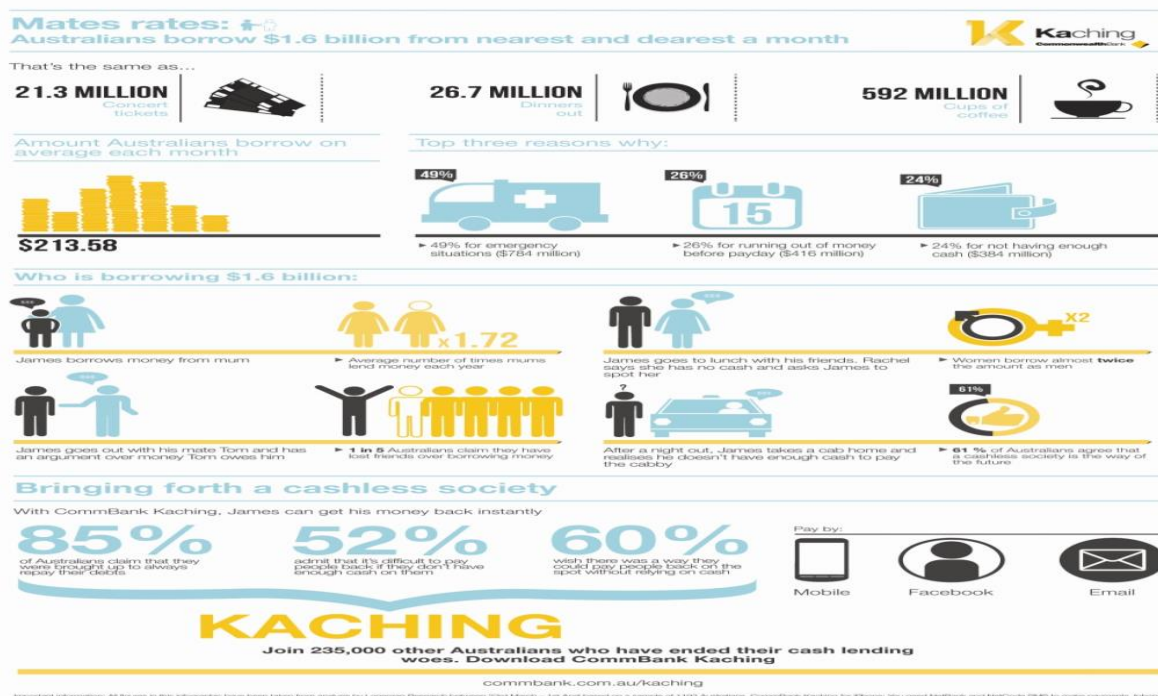


Figure 5: Kaching mobile application Source: Commonwealth bank

3.3.2 Other Key Improvements in Last 10 years

The cross organizational project from 2007-2009 is one of the finest Online projects of Commonwealth Bank Australia (Ensor, 2012). The main focus of the project is to redesign its Netbank i.e. Internet banking service with an objective of building an excellent customer with user friendly experience and driving online sales. The experience of customer journey is improvised by implementing innovative content and functionality supporting integrated secure site sales that processes with in-person channels and the bank's multichannel customer relationship management (CRM) system (Ensor, 2012). This distinct approach boosted up the online sales and showed significant proofs of customer satisfaction which added further reputation to bank's image (Ensor, 2012).

3.3.3 Improved Customer Service across Channels

The banks association with Pegasystems over the past few years resulted in use technologies like case management and predictive analytics to improve the bank's overall flexibility (Ensor, 2012). Responding to customers' according to their changing needs showing significant increase in the number processes is the prime accomplishment. Handling customer queries and resolve issues efficiently and delivering relevant messages to concerned customers across multiple channels are the other key intentions (Ensor, 2012).

3.3.4 Kaching Mobile Payment Application

CommBank's "Kaching" mobile payment app is another competent innovation to assist multiple types of payments from an iPhone (Ensor, 2012). The best part of this application as shown figure 2 is enabling multiple types of payments that include self-transactions, transfers to other accounts, bill payments through Australia's BPay service, MasterCard PayPass payments at the point of sale (using an iCarte case, not an integrated Near Field Communication (NFC) chip), payments to friends through email addresses and mobile numbers, and even payments through Facebook (Ensor, 2012). Assisting wide range of transactions using a mobile phone will encourage customers to use their phone to make easy and effortless transactions. Hence it surely is an innovative step in providing a true mobile digital wallet which is now taken as an inspiration by many other banks today (Ensor, 2012).

Initially Commonwealth bank had outsourcing with EDS technologies (Rossi, 2007) and then it followed the multiple outsourcing strategy with HCL, IBM and TCS and later it invested billion dollars to shift its decision not to outsource and build its over hyperactive cloud

computing system which covers multiple data centre's and private cloud providers in 2012 (Winterford, 2010).

3.4 ANZ

ANZ digital strategy was not at focus as much as the other banks. ANZ launched mobile banking application in the year 2008 to meet customers demand by going digital. After five years of launching the application ANZ had more than one million customers surpassing more than billion transactions (ANZ, 2018).

ANZ launched "goMoney" which was the first 'mobile to mobile' or 'person to person' payment application in the Aussie market. The world's first 'tap and PIN' contactless ATM feature was introduced by ANZ during the 2015. It was big leap in digitally transforming their digital upgrade in money transaction (ANZ, 2018).

During April 2016 ANZ is one of the 4 major banks to provide Apple Pay using Apple digital wallet. ANZ customers with ANZ Visa debit or credit cards or an ANZ American Express card can use the service. This is one of the digital transformations they have adopted (Pearce, 2016). In 2018 ANZ customers will be able to use Apple Pay, Samsung Pay, Google Pay, Garmin Pay and Fit bit Pay with their device to withdraw cash from few ATMs (Pearce, Computerworld, 2018).

In the aspects of growth towards digitalization, ANZ bank had 40 year old partnership with IBM and in 2015 ANZ bank gives access to its portfolio of software products and worked in an innovation lab along with the ANZ software developers to build its new banking software products (Kiernan, 2017). In 2017, Maile Carnegie, the head of executive digital banking, who wanted to bring change in IT infrastructure that the bank should build its own internal data storage and internal technological skill sets rather than outsourcing. These are the aspects of outsourcing within ANZ (Kiernan, 2017).

4. The Key Implications and Business Value Propositions

4.1 Commonwealth Bank

4.1.1 Net Banking

Commonwealth developed its Net banking service in the last twenties years. They provided many new services to customers, such as international money transfers, real time transactions and NetBank email alerts. In addition, CBA kept improving the security of net banking to protect users 'properties and transaction. The key goal of the net banking was to improvise their platform in which business was run. And CBA wanted to provide a convenient and trust-worthy platform to customers and attractive the customers to choose their service. It seems that CBA succeed. It is the best and most welcome bank in AU and the role net banking played cannot be ignored, Statistics show 53 % of CBA business transaction are digital in 2007(Cleeland-Mellor, 2017).. 75% logins into NetBank is through mobile device, quarter of new accounts are being opened online and CBA has 5.8 million customers using its digital platform (Cleeland-Mellor, 2017).

4.1.2 Improved Customer Service across Channels

In order to maintain the leadership in bank area, CBA uses the Pega®Customer Decision Hub to drive real-time “Next Best Conversations” for each customer –interacting with them during moments of need. This action helps CBA to improve the long-term customer satisfaction. And the results are shown as below: (<https://www.pegac.com/customers/cba>)

- #1 in CSAT for retail, business, and online banking
- 10X increase in lead volume (95% actionable)
- 3X increase in lead conversion rates
- 250 adaptive models deployed in 1 week

4.1.3 Kaching Mobile Payment Application

Kaching won much acclaim for the bank when debuted on the iOS Apple Store in 2011, it is the first of this kind in Australia, allowing customer make transaction with their Facebook accounts, email or phone numbers. The purpose of Katching is to assist multiple types of payments for IOS users. CBA announced that its Katching app had been download 750000 times and had processed \$4 billion worth of payments in 2012 (Polites, 2018).

4.2 ANZ

4.2.1 Apple Pay

ANZ is the first bank which provides Apple pay in Australia. Almost 1.6 million customers can start make in-store mobile purchases using their cheque or savings accounts in 2016. This function brings a lot of convenience to customers and help Australia moving towards a cashless economy. Now in 2018 ANZ customers are also able to use Samsung Pay, Google Pay, Garmin Pay and Fitbit Pay with their device to withdraw cash from ATMs.

4.3. WESTPAC

4.3.1 Augmented Reality

In 2014, Westpac launched a new smartphone app uses augmented reality technology to help customers to find the closest ATM, the app also shows transactions, account balances, and spending locations, all of them are displayed in three dimensions, and Westpac hopes that the app will help customers gain better control over their credit card spending (Giasson, 2018). Augmented reality technology brings mobile banking to a new level.

4.3.2 Customer Service Hub

Westpac processed its first live home loans through its new technology platform in an important step towards simplifying the end-to-end home loan experience for customers. (Bennet, 2017). This digital strategy is to provide customers convenience. Also, it simplifies, standardizes and digitizes the relationship between customers and bankers. It shown that the platform had successfully integrated into Westpac's technology ecosystem.

4.3.3 Bank Now

This 24/7 self-service lobby aims to help customers to solve their issues with digital technology when bank functions are not available. Westpac takes customers issues for a serious concern and implements new timing for customers.

4.4 NAB

4.4.1 Personal Banking Platform

Personal Banking Origination Platform (PBOP) was completed across NAB's retail network in 2016 and made it simpler to apply, and faster to approve, personal products for customers. Nab wanted to build trust with customers and restore community confidence (Kids, 2016).

According to the NAB 2017 annual review, Nab had reduced the unconditional approval of retail home loans time from 13 days to four. Most customers applying for a credit card can receive the card in two days. And most customers applying for a personal loan gain access to funds in one day (Moran, 2017).

4.4.2 Quickbiz Loan

In 2017, Nab rolled out Quickbiz Loan which is an unsecured loan, and NAB is the first Australian bank to do so. Customers don't need to provide their assets as a security, making the application easy and simple. And the process is very simple, customers can get the loan in one business day when they are approved. The Quickbiz Loan is very convenient to those who need money to start their business.

5. A Comparative Analysis of Digital Business Strategies

NAB, Commonwealth, ANZ and Westpac are Australia's four leading banks, although their business strategy may be different, there are many commonalities in their digital strategy. Most importantly, all of these banks are customer-centric, and they never stop improving the services and functions offered to customers through IT, which is the key reason why customers remove from traditional banks and want to adopt digital banking. In addition, all of these banks take every drops of advantage of IT to research customer demand and expand new business and service for customers. These banks with great digital strategy focus on differentiation and convenience of banking service to increase customer satisfaction, so nowadays customer have ability to process increasing kinds of online transactions in any place with access to Internet. Taking investment and portfolio into account, in order to increase the productivity, these banks continually invest in IT, especially transactional IT investment, to decrease the cost of the repeated processes and increase the productivity. In order to achieve better performance and economy, they all have used outsourcing to obtain or provide services in banking operations.

5.1 Commonwealth Bank vs NAB

Both Commonwealth Bank of Australia (CBA) and National Australia Bank (NAB) are historical banks in Australia but many differences exist in their digital strategies. The Commonwealth Bank launched their online banking in 1997, as the first mover in digital banking industry of Australia, which is a great competitive advantage for them. When the

Commonwealth Bank began to deploy its digital strategy, the competition in the digital market between banks in Australia was not as competitive as it is now, so the Commonwealth Bank could obtain a satisfactory market share to build a large installed base in the initial stages. In the following years, the Commonwealth Bank incrementally upgraded and optimized their digital services creating more value for users. They improved the productivity by installing the intelligence deposit machines in 2013 and aimed to facilitate the interaction between customers and expert lenders by a service of Skype A lender in 2017. Currently, digital transactions account for 53% of the total transaction volume of the Commonwealth banks (Cleeland-Mellor, 2017).

Compared with Commonwealth Bank, National Australia Bank firstly launched Internet banking service in 1999 (Bennett, 2017). Without the advantage of first mover, NAB strongly focus on technology improvement. The first technology move of NAB is the implementation of multi product class portal (Elliot, 2006), and then NAB cooperated with Oracle to gain much more advanced technology support in 2008 (Tung, 2008). Now, considering the innovation and development, NAB optimize their digital strategy by adding into the concept of FinTech. Significantly, NAB has been implemented block chain technology into their business, which has ability to revolutionize banking business (Ye Guo, 2016). In the future, NAB aggressively plan to continually get competitive advantage by leveraging tools such as DevOps, Engineering, Architecture, Security, UX and Data to meet their business strategy (Bennett, 2017).

The Commonwealth Bank's digital strategy focus on time-to-market and the long run of banking organization, relying on the advantage of first mover, the Commonwealth Bank has an absolute advantage in the digital banking competition. However, with on the technological advantages, NAB has potential to become the winner in digital banking competition.

5.2 NAB vs ANZ vs Westpac

NAB tries to expand market by improving customer experience with advanced technology. On one hand, NAB adopts the cooperation strategy and gets the technology capabilities by cooperating with IT giant. For example, in the year 2008 NAB decided to team up with Oracle to modernize its Information Technology (IT) by investing \$30 million. This was to build a new core banking system one of the first steps in new core banking system. On the other hand, NAB employs many design thinking experts and software staff to optimize business process by adopting existing technologies. For example, NAB Quickbiz Loan was launched in 2017,

which uses dynamic cash flow credit model and can handle higher limits of business loans within 60 seconds to process and maximum 3 days pay out funds. What's more, NAB constantly tracks disruptive technologies, for example, NAB uses block chain technology to revolutionize traditional banking businesses.

ANZ expands market by cooperating with popular digital platforms like apple, Google, Samsung, Garmin and Fitbit. These platforms have various third-party services, and young people like them very much. Therefore, as one of service developers, ANZ gets more customers through such networking effects.

Westpac provides start-ups an open innovation platform to propose innovative solutions. For example, uno is a digital mortgage service that match customers' need and home loan type, and QLABs can encrypts confidential data with advanced engineering methods. They are innovative services proposed by start-ups through this platform. Westpac also partnered with FinTech innovation hub Stone & Chalk to launch a platform FUELD which provides a range of powerful datasets for start-ups and data scientist teams to apply data innovations.

Through these platforms' establishment, Westpac can get more innovative ideas from talented people, start-ups and universities, which reduce employment cost and increase the reputation. NAB competes by using advanced technology and it is cooperation with IT giant is for technology advantages. NAB also develops technological capabilities by employing more design thinking expertise and software staff. ANZ cooperates with popular platforms to use network effects for more customers. Westpac cooperates with start-ups to get more innovative solutions by providing platforms and economic incentives.

5.3 Westpac vs Commonwealth Bank vs ANZ

Westpac, Commonwealth Bank and ANZ are all committed to increasing customer engagement and interaction through IT technology, but their focus of strategies are different. In 2018, Westpac introduced a new service that allows users to access banking services while texting with their contacts (Connolly, 2018). Users can get rid of online banking or banking application, and they have ability to process basic transactions while chatting. Nowadays, smartphone has been embedded into people's daily life, so Westpac's new service based on message service can greatly increase the interaction between users. Leveraging the same-side network effect, the value of users will increase with the amounts of users, so more and more users may be attracted by this service.

In 2017, the Commonwealth Bank provided users with new services for Skype A lenders to create a new digital communication channel for customers and expert lenders. Users can discuss and consult directly with their personal expert lenders and experience a more convenient loan service through this service. This service promotes interaction between customers and expert lenders, which can be considered as a kind of cross-side network effect. Unlike Westpac's services, the increase in the number of users can create more value for banks and expert lenders. The advantage of this service is that it not only increases the productivity of loan services, but also becomes an important weapon to seize market share in loan services. For ANZ, they have launched “goMoney” service that is a mobile-to mobile or person-to-person payment application (ANZ, 2018). Same as Westpac, ANZ want to increase the likelihood of winning competition through the increasing interaction created by “goMoney”, taking advantage of same-side network effect.

Westpac, Commonwealth Bank and ANZ very focus on customer engagement and interaction, Westpac and ANZ hope to use same-side network effect to increase their competitive advantage, while Commonwealth Bank chooses cross-side network effect.

5.4 Findings

NAB, Commonwealth, ANZ and Westpac all have their own digital strategies, these different strategies focus on customer needs and aim to provide customers with more and more useful and friendly services to attract users and foster customer loyalty. However, the digital strategies of the four leading Australian banks have different priorities. The Commonwealth Bank has the competitive advantage of the first mover, they will never stop optimizing the services they can provide and delivering new digital banking services to the market. NAB focuses on innovative technology and explores how to use FinTech to revolutionize the banking industry. For NAZ, they partnered with Apple to become the first Australian bank to support Apple Pay services. The advantages of a cooperative strategy can help NAZ stand in the competitive position of the banking industry. Westpac uses IT to facilitate interaction between users in instant messaging applications, which can significantly create more value for banks and users. There four major Australian banks with different priorities have the potential to win competition in the banking industry.

6. Conclusion

In the digital age, the traditional banking industry faces the enormous challenge of successfully developing and implementing a digital strategy, moving from traditional operations to digital

operations. As four major Australian banks, NAB, CBA, ANZ and Westpac have begun to deploy their respective digital strategies many years ago, and have achieved positive results. These digital strategies help banks create new digital channels to facilitate interaction between users and bank practitioners, and the transactional cost of banking operations can be significantly reduced by IT system used to process repeated operations automatically. At the same time, IT has the ability to increase the productivity of the banking industry. Some complex banking business that takes a lot of effort and time to process can be received and completed using an IT system, such as loan approvals. Therefore, digital strategy can create extra value for mutual benefit to customers and banks. Although the business strategies of NAB, Commonwealth, ANZ and Westpac may be different, their digital strategies still have commonalities. Basically, these strategies are customer-centric and is designed to provide a better experience for customers. Because of the different development history of each bank, the digital strategies they have developed are also different. These digital strategies can be a powerful weapon for banks in fierce competition.

7. References

ANZ. (2018). Retrieved from ANZ: <https://shareholder.anz.com/pages/180-years>

Atherton, M. (2015). Digital disruption is good news for banks. *American Banker*, 1(146)

Bennet, M. (2017). Tech program in mortgage milestone.

Bennett, A. (2017, Nov 10). Supporting Customers in digital age. Retrieved from NAB: https://news.nab.com.au/news_room_posts/supporting-customers-in-the-digital-age/

Business editor Peter Ryan. (2015). Traditional banks facing digital disruption: Australian banks could face a potential threat to their lending businesses, with peer-to-peer lending evolving as latest digital disruption to the traditional economy. in P2P lending, borrowers and lenders are matched online, and the british-based lender, ratesetter, has just set up in australia with the aim of cashing in on breaches of trust that have been plaguing traditional banks. *The World Today*

Chau, D. (2018). CBA, westpac, ANZ and NAB are in for 'tougher times': UBS report: The royal commission, rising costs, and tighter lending conditions are some of the factors which led UBS to downgrade its ratings for australia's banks. *ABC Premium News*

Cleeland-Mellor, M. (2017, June 13). 20 Years On, Half Of CommBank's Transactions Are Digital. Retrieved from WHICH-50: <https://which-50.com/20-years-half-commbanks-transactions-digital/>

Commonwealth bank of australia (2018). Salem Press.

Connolly, B. (2018, Jan 19). Westpac unveils text payment service. Retrieved from CIO: <https://www.cio.com.au/article/632365/westpac-unveils-text-payment-service/>

Corrs. (2018). OUTSOURCING MANAGEMENT OF NAB'S DATA CENTRES AND INFORMATION TECHNOLOGY INFRASTRUCTURE TO IBM. Retrieved from Corrs: <https://www.corrs.com.au/deals/outsourcing-management-of-nab-s-data-centres-and-information-technology-infrastructure-to-ibm/>

Digital disruption to force retail banks to reinvent customer service (2016). Aspen Publishers, Inc.

Elliot, S. (2006). Technology-Enabled Innovation, Industry Transformation and the Emergence of Ambient Organizations.

Ensor, B. (2012, Feb 29). Learning From Digital Innovation At Commonwealth Bank Of Australia. Retrieved from Forrester: https://go.forrester.com/blogs/12-02-29-learning_from_digital_innovation_at_commonwealth_bank_of_australia/

Garispe, J. (2017, August 4). Multi-Factor Authentication as a Best Practice. Retrieved from Akins IT: <https://www.akinsit.com/multi-factor-authentication-best-practice/>

Giasson, A. (2018). Augmented reality banking app to be launched by Westpac ★ Mobile Commerce Press. Retrieved from <http://www.mobilecommercepress.com/augmented-reality-banking-app-launched-westpac/8513395/>

IESE, O. W. (2017). DESIGN THINKING THE NEW DNA OF THE FINANCIAL SECTOR. Internet World Stats, "World Internet Usage and Population Statistics", 2012.6.30. <http://www.internetworldstats.com/stats.htm>

Kiernan, S. (2017, May 25). ANZ Bank looks to DIY tech under Maile Carnegie. Retrieved from itnews: <https://www.itnews.com.au/news/anz-bank-looks-to-diy-tech-under-maile-carnegie-462973>

Kids, W. (2016). ANNUAL REVIEW 2016. Retrieved from <https://www.nab.com.au/content/dam/nabrwd/documents/reports/corporate/2016-annual-review.pdf>

Moran, S. (2018). ANNUAL REVIEW 2017. Retrieved from <https://www.nab.com.au/content/dam/nabrwd/documents/reports/corporate/2017-annual-review.pdf>

Mithas, S., Agarwal, R., & Courtney, H. (2012). Digital business strategies and the duality of IT. IT Professional, 14(5), 2-4. doi:10.1109/MITP.2012.96

Palmer, D. (2016, Feb 10). NAB to roll out new personal banking platform this month. Retrieved from Delimiter: <https://delimiter.com.au/2016/02/10/nab-roll-new-personal-banking-platform-month/>

Pearce, R. (2017, May 08). Westpac's digital investment paying off, CEO says. Retrieved from Computerworld: <https://www.computerworld.com.au/article/618866/westpac-digital-investment-paying-off-ceo-says/>

Pew Research Center, "Two-thirds of young adults and those with higher income are smartphone owners", 2012.9.11.

Polites, H. (2018). CBA set to axe Kaching. Retrieved from <https://www.theaustralian.com.au/business/business-spectator/news-story/cba-set-to-axe-kaching/166ccd4721a009ff7ab1b8488668239a>

Rossi, S. (2007, July 18). Commonwealth Bank revamps its outsourcing contract with EDS. Retrieved from Computerworld: https://www.computerworld.com.au/article/189427/commonwealth_bank_revamps_its_outsourcing_contract_eds/

Sikora, P. (2001). The four pillars of wisdom: The major banks rethink their strategy: Australia's four main banks taken different -- but largely successful -- strategies to grow their business says standard & poor's associate director peter sikora. (rethinking strategy). Journal of Banking and Financial Services, 115(4), 28.

Smith, P. (2014, July 1). Westpac eyes up more outsourcing. Retrieved from Financial Review: <https://www.afr.com/technology/enterprise-it/westpac-eyes-up-more-outsourcing-20140630-jgqwv>

Tay, L. (2011, Nov 4). itnews. Retrieved from NAB outsources IT transformation: <https://www.itnews.com.au/news/nab-outsources-it-transformation-278823>

Timson, L. (2014, August 5). Westpac adds augmented reality to online banking toolbox. Retrieved from The Sydney Morning Herald: <https://www.smh.com.au/technology/westpac-adds-augmented-reality-to-online-banking-toolbox-20140805-100nbw.html>

Tung, L. (2008, Aug 6). Just \$30m for NAB's first step. Retrieved from ZDNet: <https://www.zdnet.com/article/just-30m-for-nabs-first-step/>
Westpac. (2018). Bank Now.

Westpac Banking Corporation. (2017). Westpac Banking Corporation - Premium Company Report Australia. Retrieved from IBISWorld: <https://www.ibisworld.com.au/australian-company-research-reports/financial-insurance-services/westpac-banking-corporation-company.html>

Winterford, B. (2010, July 6). Interview: Inside the Commonwealth Bank's cloud. Retrieved from itnews: <https://www.itnews.com.au/news/interview-inside-the-commonwealth-banks-cloud-218889>

Ye Guo, C. L. (2016). Blockchain application and outlook in the banking industry. Springer Berlin Heidelberg.