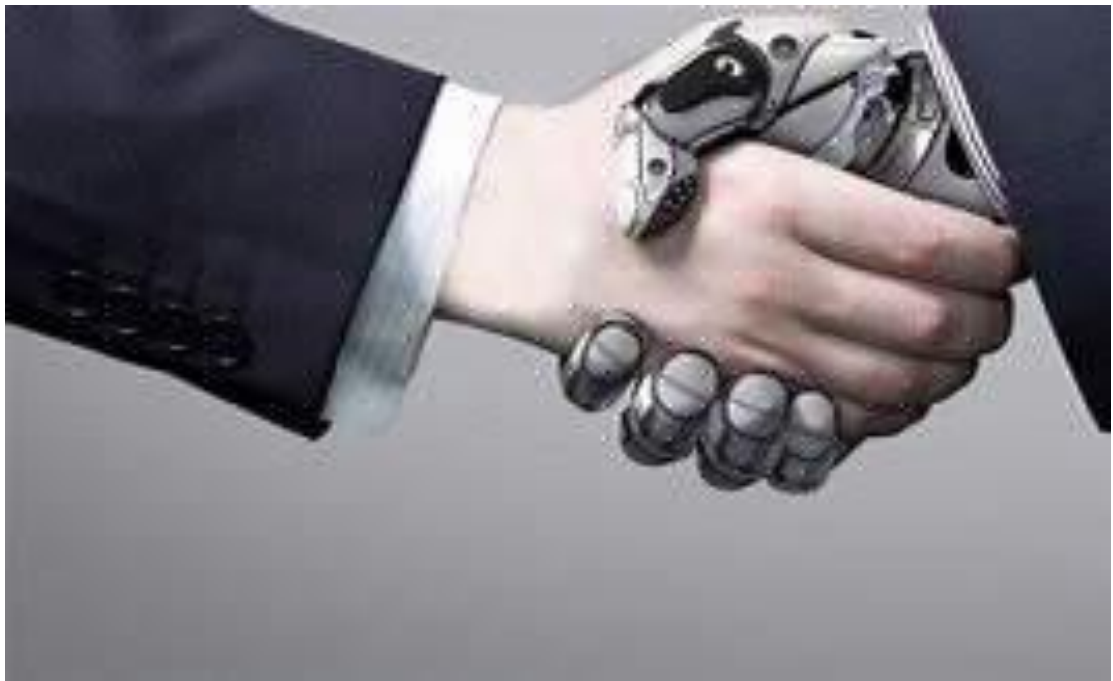




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RURAL LEADERSHIP
PROGRAMME



What are the Implications of Technologies for Rural Banking by Year 2030

A Literature Review of What Lies Ahead for Rural Banking From a Rural Bank's Perspective

Kellogg Rural Leadership Programme

Course 38 2018

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EXECUTIVE SUMMARY

The report titled: What are the Implications of Technologies for Rural Banking by Year 2030 sets out to establish the following key aims:

- What the major technologies are, that are most likely to significantly impact the New Zealand Rural Banking sector.
- To understand the implications of these technologies and their likely impact on the Rural Banking sector.
- To provide recommendations as to how NZ Rural Banks should respond.

A literature review was undertaken in order to gain a good understanding thereof. This entailed extensive literature reading.

In addition, informal discussions were also held with bank executives to ascertain a balance of viewpoints.

Key findings of the report are as follows:

- Technological change is happening now and is changing banking rapidly. By 2030 there is expected to be major changes reshaping the sector.
- Technologies will bring about both risks and opportunities for all involved.
- Whilst New Zealand (NZ) Rural Banks could be considered a niche industry, it is not immune to a lot of new technologies.
- New Zealand (NZ) Rural Banks are at risk of disruption if they do not adapt rapidly and continuously.
- There will be an impact on humans, both positive and negative.
- The human interface between rural banking and its rural customers will remain vitally important.

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3.0 Introduction

We are in the midst of one of the biggest revolutionary changes in the workplace at present. No one knows what the future of our present work and employment will look like, or whether it will even exist.

Technologies have been changing exponentially.

For example, the first mobile phone was invented on April 3, 1973 and could be purchased for US \$3,995 (NZ \$5,700 at US exchange rate 68c). Today they can come free as part of a phone company contract.

Kodak is another example – Established on 4 September 1888, in 1976 the company sold 90% of the photographic film in the US along with 85% of the cameras. By January 19, 2012: Kodak filed for [Chapter 11](#) Bankruptcy Protection. The company's stock was delisted from NYSE and moved to OTC exchange. It had been disrupted by digital cameras (Wikipedia - *McCarty, Dawn; Jinks, Beth (January 19, 2012). "Kodak Files for Bankruptcy Protection". Bloomberg. Retrieved January 19, 2012).* ["Kodak Files for Bankruptcy Protection"](#). Bloomberg. Retrieved January 19, 2012).

Technologies have also spawned a whole wave of new opportunities and disruptions for existing businesses that, up until today have had free reigns on their products and services. Rural banking, as a sub sector of banking is no exception.

1.1 - Technology definition

- *"The application of scientific knowledge for practical purposes, especially in industry"* (source - <https://en.oxforddictionaries.com/definition/technology>).

- *"The purposeful application of information in the design, production, and utilization of goods and services, and in the organization of human activities."* (Source - <http://www.businessdictionary.com/definition/technology.html>)

1.2 – Banking Definition

- *"The business conducted or services offered by a bank."* (Source - <https://en.oxforddictionaries.com/definition/banking>)

"Twenty years ago there were fewer than 700,000 industrial robots worldwide; today, there are 1.8 million and the number could soar to 2.6 million by 2019. (Source: PwC, CEO20 Public Survey (2016)) Robots are now entering the services arena; 3-D printing can be used to make cars and aircraft; biotechnology will change the way we grow crops, produce food and manufacture medicines; and nanotechnology and artificial intelligence will affect various industries.

The public mood around these rapid advances is one of apprehension, with 79% believing technology will cause job losses over the next five years. Despite this, 30% of the businesses we surveyed disagreed with the statement that technology would replace current talent in the next ten years. "(The Future of Talent 2017)

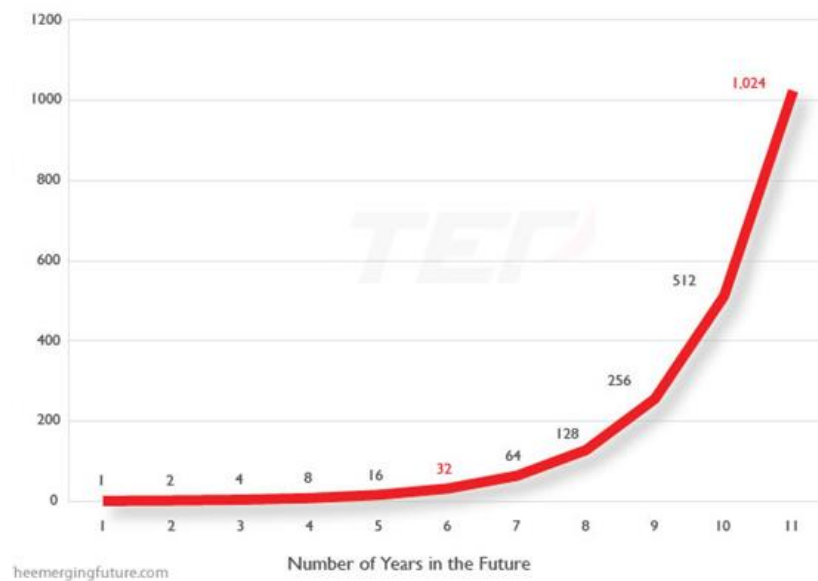


Figure 1: Human Intuitive Perspective of Technological Advancement in Ten Years, A thousand times more advanced. (Source – Theemergingfutures.com) - “Today small companies are creating the paradigm changes that were the domain of large corporations, universities, and government agencies. Now boost it 1,000 times. The current eleven months doubling rate of technology known as “The Law of Accelerating Returns” is getting faster.”

Whilst there are literally thousands of new technologies coming to the fore, I have selected the ones that are “most likely”* to have a “major” (i.e. likely the bank will be required to take action) impact on rural banking, based on what we know today.

* - in the writers opinion

4.0 Aims and Objectives

In this research I will look to define what technologies are influencing today's rural banking future by looking at a range of literature and discussions with industry sector representatives. Based on that information, define what other banks are doing in response to these technologies and come up with recommendations most likely to maximise the success of rural banking in future.

- To focus on rural banking specifically rather than banking in general? Why? It's a specialist area of banking that relates to me and my colleagues.
- To broaden perspectives, views, opinions and discussion as to what the future of rural banking may look like in 2030.
- To provide insight as to where rural banking could invest in order to remain viable, competitive and relevant to our customers.
- To assess and analyse what needs to change.
- To provide a view of what the future holds from a rural banking perspective.

5.0 Methodology

The following research for this report is based upon a literature review and thematic analysis.

The literature review formed the major part of this project. A wide range of verified organisational websites were visited for reference purposes.

The Major Technologies likely to impact Rural Banking by 2030.

There are literally thousands of technologies either in play now and/or being developed. The major players at present are:

6.1 Artificial Intelligence

Artificial Intelligence is best described as:

“The blend of three advanced technologies – machine learning, natural language processing and cognitive computing. The concept of Artificial Intelligence is to simulate the intelligence of humans into artificial machines with the help of sophisticated machine learning and natural language processing algorithms. The prime motive for the idea of transferring the intelligence from humans to machines is to overcome the very barrier of human intelligence: scalability.” (Devendra Mangani, Senior Consultant, Bizofit).

There’s always a limit to the speed with which humans can perform any given tasks. Artificial intelligence looks to overcome this very challenge with human intelligence by transferring the human intelligence to cognitive machines with supreme computational capabilities.

There are numerous examples of AI in our daily lives including Siri and Netflix.

In recent years artificial intelligence has greatly impacted the banking industry. Reasons for its widespread adoption are detailed in the graph below:

There are four key applications of artificial intelligence in the Rural Banking industry.

1. Anti – Money Laundering (AML) Pattern Detection

AML refers to a set of procedures, laws or regulations designed to stop the practice of generating income through illegal actions. In most cases, money launderers hide their actions through a series of steps that make it look like money that came from illegal or unethical sources are earned legitimately.

Most of the major banks across the globe are shifting from rule based software systems to artificial intelligence based systems which are more robust and intelligent to the anti-money laundering patterns. Over the coming years, these systems are only set to become more and more accurate and fast with the continuous innovations and improvements in the field of artificial intelligence.

2. Chat Bots

Chat bots are artificial intelligence based automated chat systems which simulate human chats without any human interventions. They work by identifying the context and emotions in the text chat by the human end user and respond to them with the most appropriate reply. With time, these chat bots collect massive amount of data for the behaviour and habits of the user and learns the behaviour of user which helps to adapt to the needs and moods of the end user.

Chat bots are already being extensively used in the banking industry to revolutionize the customer relationship management at personal level.

Meet Josie, our innovative digital assistant

11 June 2018 / Published in Tech & Innovation

Share: [f](#) [t](#) [in](#) [e](#)



Figure 2: Examples of chat bot use in New Zealand Banking are with “Josie” at ASB and “Jamie” for ANZ.

3. Fraud detection

Fraud detection is one of the fields which has received massive boost in providing accurate and superior results with the intervention of artificial intelligence. It's one of the key areas in banking sector where artificial intelligence systems have excelled the most.

Starting from the early example of successful implementation of data analysis techniques in the banking industry is the FICO Falcon fraud assessment system, which is based on a neural network shell to deployment of sophisticated deep learning based artificial intelligence systems today, fraud detection has come a long way and is expected to further grow in coming years.

4. Credit and Risk Assessment/ Customer Recommendations

Recommendation engines are a key contribution of artificial intelligence in the banking sector. It is based on using the data from the past about users and/ or various offerings from a bank like credit card plans, investment strategies, funds, etc. to make the most appropriate recommendation to the user based on their preferences and the users' history.

Recommendation engines have been very successful and a key component in revenue growth accomplished by major banks in recent times.

With Big Data* and faster computations, machines coupled with accurate artificial intelligence algorithms are set to play a major role in how recommendations are made in banking sector

*Big Data - Big data is a term used to refer to data sets that are too large or complex for traditional data-processing application software to adequately deal with (source - https://en.wikipedia.org/wiki/Big_data).

6.2 Big Techs (Banks)

Big techs are large technology companies. Examples of these include Apple, Google, Ali Baba and Facebook.

It is highly conceivable that these companies will become major disrupters of the future banking industry.

“Studies have shown that banking is most at risk of disruption from the millennials. Over the next 3 years 68% of millennials believe access to money will be completely different from 2016 and 70% believe that the way we pay for things will be different .”(Scratch Survey 2016)

So why would a big tech want to delve into what is presently a highly competitive industry?

Amazon is a big tech company that has already taken steps into the banking industry and its case is detailed below.

“..... It can afford to go after this previously unprofitable segment in part because it will be able to transform the economics of banking; Amazon does not have the burden of an expensive branch and contact center network, which we estimate comprises roughly 40% of a North American retail bank’s costs on average. Instead, Amazon could steer new customers to “just ask Alexa,” its voice assistant on the Echo device. The company can also avoid a lot of the customer acquisition costs borne by most direct banks because it already has digital relationships with so many Americans. Given these two advantages, Amazon’s incremental costs will be almost nil.

Amazon will not legally become a bank. Rather, the bank it partners with would probably hold deposits, while Amazon would design and manage the customer experience and distribution. The arrangement allows Amazon to avoid dealing with bank regulatory compliance and managing the balance sheet. Amazon might generate revenue through fees and royalties from the bank partner, though the more valuable financial benefit will likely be the savings Amazon realizes from direct access to customers’ checking accounts. Amazon could make it easy for customers to pay right from that account instead of with their credit cards, which impose an average 2% interchange fee for most transactions on Amazon or its third-party merchants.....



Figure 3: Amazon.com logo.

Once Amazon has established a cobranded basic banking service, we expect the company to move steadily but surely into other financial products, including lending (both purchase financing and debt consolidation), mortgages, property and casualty insurance, wealth management (starting with a

simple money market fund to hold larger balances), and term life insurance. Amazon would follow the typical order of needs for its target customers as they age and move through different life and family stages. Underpinning this all, Amazon has a massive data platform and continually refines its ability to personalize offers and communications. Online shopping patterns already tell Amazon what it needs to know about customers' life events, from getting married to having children to buying a house, which will allow the company to offer relevant financial services products—and information from those products will further increase the depth of the data. du Toit and Cheris (2018)

Another key example is that of Alibaba in China.

"In China, e-commerce giant Alibaba has amassed the world's largest money market fund, issued \$96 billion of loans in five years and grown Ant Financial to a market capitalization roughly equivalent to the ninth-largest bank in the US. Alibaba also started online bank MYbank, which approves loans instantly using automated processes based on consumers' financial history with Alibaba. Customers globally also sent \$1.7 trillion in total payments through Alibaba's Alipay service last year, roughly five times the global payment volume that flowed through PayPal—another sign of big tech's edge over fintech." (du Toit and Cheris 2018) March 2018 - <https://www.bain.com/insights/bankings-amazon-moment/>

In terms of the speed and customer offering, this is best summarised below:

"MYbank operates on a Cloud Computing platform. There is no bank staff involved in giving loans. Big data is used to calculate the loan amounts. The whole process is quick and easy—a far cry from how things work at traditional banks. In the future if you want to get a loan from MYbank, you only need to spend three minutes on a two-step process: three minutes to fill the application and submit, then wait. Once the application is approved, the money will reach your account within one second" (<http://fintechranking.com/2016/12/26/alibaba-baidu-and-tencent-and-their-new-online-banks/>).

Whilst they do not yet pose a threat to something as small and niche as the NZ Rural Banking industry, it is clearly evident that the speed and efficiency of big tech banking is impressive and some customers will find this far more appealing than what is currently a complicated and protracted process which rural customers have to go through at present.

6.3 Blockchain

The blockchain – or the 'distributed ledger' – is a record of digital events that's shared between many different parties. It can only be updated after consensus from a majority of the participants in the system and, once entered, the information can never be erased. The blockchain therefore contains a certain and verifiable record of every transaction ever made, demonstrating that digital records can be held securely without any central authority.

While it's likely to have broad potential, a few benefits are particularly worth highlighting:

- **Security** – The fact the blockchain ledger is distributed across thousands of computers means that hacking is almost impossible, reducing server maintenance requirements and improving security for banks.

- **Transparency** – The sender and the recipient of every transaction are recorded and all transactions are publicly available for inspection. The blockchain reveals how money flows around the financial system, and into which markets.
- **Privacy** – Users are anonymous and can move money around instantly and securely. This allows banks to save time and reduces costs on international transactions.
- **Risk** – No single authority has control, which means that if there's a fault, the rest of the network will continue to function. Currently, if a bank's system goes down, users are unable to perform transactions; using blockchain technology, the bank's system would continue as normal.

The technology faces some challenges in terms of regulation, access, and ownership. However, it's difficult to ignore its potential to simplify banking by reducing costs, improving product offerings, and increasing speed for banks.

1. Clearing and settlement.
2. Payments - Central banks across the world are exploring the potential for shifting parts of their payments systems on to blockchain technology or even using it to launch digital currencies. This is partly a response to the challenge that standalone cryptocurrencies such as bitcoin could pose to their control of monetary policy. It also underlines how central bankers are waking up to the potential benefits of the technology for the payments system.
3. Trade Finance - Trade finance is still mostly based on paper, such as bills of lading or letters of credit, being sent by fax or post around the world. Many believe that blockchain is the obvious solution especially as numerous parties need access to the same information.
4. Identity Verification - of customers and counterparties is a vital for banking. Without it, lenders would quickly lose their roles as trusted guardians of people's money. Regulators hold banks responsible for checking that customers are not criminals or illicit actors, and fine them if they get it wrong.

Block chain usage can also be applied to other areas. For example, it is currently being considered for food identification and transparency .

6.4 Cryptocurrencies



Figure 4: Bitcoin: Source <https://bitcoin.org/en/>

Cryptocurrencies are a relatively new phenomenon, originating from the early 2,000's.

What is it?

"A digital currency in which encryption techniques are used to regulate the generation of units of currency and verify the transfer of funds, operating independently of a central bank."

(Source: <https://en.oxforddictionaries.com/definition/cryptocurrency>)

"Legally cryptocurrencies must be classified as private money, and within this group as the so called community currency." (Srokoz & Kopyskianzy 2013 p 619).

The legal status and subsequent processes around this are a constant source of confusion for the general public.

"In most countries it is legal to make payments in cryptocurrencies...." However "Cryptocurrencies are not recognised as legal tender". (Srokoz & Kopyskianzy 2013 p 619).

Cryptocurrencies have evolved mainly for two reasons:

- Shortcomings of the traditional currency system (unable to face numerous financial crises).
- Development of the internet (where cryptocurrencies can be a better suited form of money).

How it works

There is no exchange of money in a transaction. The cryptocurrency system is a unique ledge of transactions. There is nothing that corresponds with legal tender currency. The wallets of the users of cryptocurrencies store only the information ("links") indicating where, in the blocks, the transaction confirmation can be found.

There is no “movement” between the wallets of one user to the other. The only thing that changes are the “links”.

Cryptocurrencies are global by nature as they transcend the internet. Everyone is able to use it.

Risks

Listed below are the risks associated with cryptocurrencies. Because of the number and breadth of risks the investment potential is limited relative to existing legal tender currencies.

- Legal – it is not yet recognised as legal tender.
- Economic – at present it is highly volatile.
- Criminal activity – cryptocurrencies are highly suited to money laundering and financing terrorism as they provide anonymity, they are global, easy to store, and very difficult to access by unauthorised persons.
- Highly energy intensive with a large amount of computer power required to process transactions.
- Low capitalisation due to a low level of trust in the product.

Whilst there’s no doubt in the potential for cryptocurrencies in the future, it is not considered a high risk to the NZ Rural Banking sector at present.

There is very limited usage of cryptocurrencies by New Zealand rural customers due to the above factors.

6.5 Lending Platforms

Peer to Peer (P2P) lending and crowd funding is a relatively new phenomenon to New Zealand, having been formally legalised in 2014.

There are presently eight P2P businesses in New Zealand being Harmoney Corp Limited, ChangeFund Pty Ltd, Southern Cross Partners Ltd, Citizens Brokerage Limited, Pledgeme Ltd, Lending Crowd Ltd, Squirrel Money Limited, Zaggia Limited. (Source: FMA 2018).

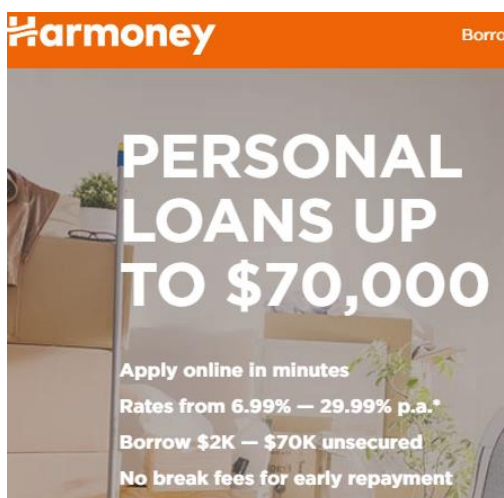


Figure 5: New Zealand’s P2P lending Platform Harmoney : Source: <https://www.harmoney.co.nz/>

How it works

P2P is a platform that acts as a facilitator (P2P business), matching lenders and borrowers through its online systems. The facilitator sets interest rates, completes loan applications, creates loan agreements, collects signatures, manages loan payments, keeps everyone anonymous, collects arrears (not in every case).

Depending on the P2P business, some loans are secured and some are unsecured. Interest rates are typically higher than standard bank rates due to the higher risk of default.

The lender (private) lends the money and decides what funds to invest into. They also take all of the risk. Whilst the P2P business is likely to make best endeavours to get the money back there is always a risk some or all of the money may be lost. On this basis the lender needs to do their own checks.

P2P remains a very small part of the lending landscape in New Zealand. It is considered by many as risky. It is also very limited by the lack of capital.

The above businesses are not perceived as a risk NZ's rural banking industry. However the bigger threat lies with the platforms themselves, which potentially enable competitors to enter the industry cost effectively and to upscale very quickly.

Crowdfunding is also growing rapidly in New Zealand with Give a Little and Pledge Me becoming more popular. Crowdfunding is a type of financial market service in New Zealand covered by the Financial Markets Conduct Act (FMC). At this point in time it appears to be used more for start up businesses or donations.

“Crowdfunding works by many people (the crowd) putting in small amounts of money to raise funds for a company or project.

When you put money into an equity crowdfunding project, you're buying shares. Typically this will be in small or start-up businesses, meaning you become a part owner of the business.

Crowdfunding is also often used to describe donation or rewards-based fundraising. In those cases supporters receive rewards (for example tickets to a show or a credit on a film or website) or simply make donations to individuals in need or charities. This type of fundraising is legal, but is not covered by financial market laws.

Equity crowdfunding is usually done on websites run by crowdfunding service providers.” (Source : Financial Markets Authority)

6.6 Artificial Proteins/ Food

Much has been written in recent times about artificial foods and proteins and its potentially disruptive impact on naturally produced foods.

Whilst a few years ago they seemed a long way into the future, it is possible today to potentially compete with New Zealand's agriculture industry:

Cultured Milk

“It is possible to make milk without a cow. The process uses genetically engineered (GE) yeast to bio-brew milk in vats. The technology is very similar to the process currently used to make insulin for diabetics which also uses GE yeast (or bacteria) or like beer which is brewed in a similar fashion.” (Small B, 2018)

“Perfect Day” (<http://www.perfectdayfoods.com>) was started in 2014 and is seeking to produce synthetic milk that actually looks and tastes like real milk.

Cell cultured Meat, fish and fowl

“It is also possible to grow meat, fish and fowl in a cellular process .Muscle cells are painlessly harvested from a donor animal via a biopsy and nurtured in a bioreactor to multiply and create muscle tissue”. (Small B, 2018)

The cost to develop the above processes has decreased exponentially. The first cell cultured hamburger patty was produced in 2013 at a cost of \$325,000US. In 2015 the same item was produced for under \$12US.

Companies producing cell cultured meat include Mosameat, Boston Meadow, Boston Meats, SuperMeat and Finless Foods.



Figure 6: Mosa Meat : Source <https://www.mosameat.com/>

Plant based Meat and Fowl

As suggested above, these are plant based flesh and fish made to look, feel and taste like the real thing.

Impossible Foods is a high profile (advertised on Air NZ flight menus in 2018) business that makes a plant based burger patty.

Beyond Meat is another plant based patty example. Sunfed Chicken is New Zealand's own attempt at plant based chicken meat.



Figure 7: Sunfed Foods : Source <https://sunfedfoods.com/>

Other

The food industry is not just being transformed with meat and milk. There are now plant produced synthetic eggs (Hampton Creek) and synthetic whiskey (Endless West). Although notably both synthetic eggs (Hampton Creek) and synthetic wine (Ava Winery) that were the new food startups in 2016, have both hit troubled times and are now no more.

The major appeal of these products includes all or some and perceived or real, as follows:

- Reduced environmental impact.
- Enhance food safety , nutritional value and security.
- Improve animal welfare.
- Reduced carbon footprint and transport costs.

Whilst the impact today has not yet been truly felt by traditional agriculture it's disruptive potential is undoubted.

"...even if they are only partially successful, it will be truly disruptive to current agricultural practice, the people employed in agriculture, and many of both the upstream and downstream businesses associated with agricultural production."(Small B, 2018).

New Zealand's rural banking system, as funder of traditional agriculture, will be directly impacted by synthetic foods. How should rural banks respond? Should they be looking to fund these start up synthetic food producers as a growth industry? Or should they remain stoically loyal to their existing customers? Should they be leading New Zealand's farmers through these times or merely funding them, and allowing farmers to make their own decisions as to what's best for themselves?

One thing is for certain, there will be disruption in this space. The only questions are around the quantum and true impact. If traditional agriculture becomes superseded by synthetic foods then it's investment and lending target markets are likely to change accordingly as the risks will increase and returns on funds invested decrease.

7. SUMMARY OF FINDINGS - WHAT ARE THE IMPLICATIONS

The implications of technologies on the Rural Banking sector are many and varied.

- 7.01 - Labour force - Technologies will have a major impact on the workforce in future.

“By 2020, the World Economic Forum predicts that more than one-third of the desired skill sets of most jobs will comprise skills not yet considered crucial today.

Whatever the numbers may be, one thing is certain: technology will have a disruptive impact on the workforce, and it will do so right across the skills spectrum.” (Source – The Future of Talent p 15).

Whilst technologies will cause major disruption in the workforce, it's important to consider what role humans will play alongside machines.

“Nearly 50% of companies expect that automation will lead to some reduction in their full-time workforce by 2022, based on the job profiles of their employee base today. However, 38% of businesses surveyed expect to extend their workforce to new productivity-enhancing roles, and more than a quarter expect automation to lead to the creation of new roles in their enterprise.” (The Future of Jobs, 2018).

There are many benefits that come with technology and employers will be keen to exploit these opportunities. However it should also be recognised that humans will continue to provide insight, enterprise and creativity that will remain extremely difficult for new technologies to duplicate. The skillset required by employees is also highly likely to change from technical skill to *softer* skills.

“The skills required for this new way of working are also changing, with employers looking not for deep technical skills, but instead for “enterprise skills” such as the ability to problem solve, communicate effectively, adapt, collaborate, lead, create and innovate. While skills In STEM (science technology engineering and maths) will remain important, these enterprise skills’ have increasingly become the foundation as employers recognise that many technical skills can be learnt later by the right talent.” (Source – The Future of Talent p 4).

Jobs that exist today may well not exist in the future, and new jobs will also be created.

In a rural banking sense labour/ staff will potentially be impacted. Technology will reduce some back office type roles.

This could potentially free up more time to allow conversations/ discussions around more value add issues such as strategy, governance, succession, mental and physical wellbeing, health and safety, digital adaptation and uptake, innovation. It allows this through undertaking tasks such as budget and cashflow forecasts, accounts analysis, credit and risk assessment and property valuations. It may allow deeper insights into Big Data.

The relationship manager type role could be expected to extend further into trusted advisory status. Customer expectations of financial products and expertise are increasing progressively. Whilst technology will better utilise the masses of data available, it's the assessment and utilisation of the data that is likely to still require rural expertise that rural bankers possess.

- **7.02 - Decreased Barriers to Entry for Competitors**

“Technology has decreased barriers to entry. It is easier for new businesses to join the market and compete for market share, intensifying competition. This competitive pressure, as well as quickly

evolving consumer demand, means that incumbent businesses have to regularly review and adapt their business models. Incremental innovation and improvements are increasingly important.” (Source – The Future of Work 2016 p15).

It is unlikely that future competitors will want to become banks due to regulatory rules and expenses.

However, competitors can choose to “cherry pick” the most profitable and/ or most desirable parts of rural banking without being required to be registered as a bank. As such, this is considered an increasing risk to rural banking.

- **7.03 - Peer to Peer (P2P) Economy (Sharing Economy)**

Increasingly buyers can connect directly with sellers. Examples of P2P economy are Uber, Trade Me, Air BnB, Uber.

Connecting directly drives down transaction costs and barriers to entry. P2P currently represents a small proportion of the economy. However, although its direct impact is not large, the P2P economy has substantial reach.

“This trend is mirrored globally – in a 2014 international survey, two-thirds of respondents were willing to buy or sell products in a sharing or P2P community.” (Source – The Future of Work 2016 p22).

P2P’s disruptive potential is in its platforms, which remove traditional hierarchies. There are often no or few employers or employees, merely providing a method of facilitating connections between buyers and sellers.

“Uber, the world’s largest taxi company, owns no vehicles... Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world’s largest accommodation provider, owns no real estate.” (Source - Tech Crunch 2015).

As mentioned earlier in this report, the P2P economy is an emerging threat to rural banking and its potential impact could be large.

- **7.04 – Expenditure**

New technologies have had varied results when assessing cost increase or decrease that it generates.

Decreased branch numbers – bank branches are expensive with most retail branches costing retail banks between 40-60% of operating costs. Their reduction, enabled through the increasing use of mobile and internet banking has saved on financial costs. However some branches, especially rural ones or those frequently visited by the elderly or non-technology minded have met with dismay at a social level.

Most banks still run core systems implemented in the 1970’s and 1980’s. These enterprise structures are made up of a patchwork of limited functionality for the current digital environment. These are

expensive as they waste a lot of time, are prone to error or malfunction, require duplication and are heavily manual. New technologies will replace the outdated ones, however they require capital expenditure.

On the flip side, banks costs in other areas have been increasing substantially. These are not necessarily technology based however these have had the effect of reducing the net positive impact of new technologies. . The primary one is the regulator's response to the global financial crisis. Basel III along with a number of other regulations. Regulation has required banks to add high-paid risk, legal, and compliance employees.

The capital cost of IT infrastructure and implementation is also a very large expense. These have been required both for regulatory and efficiency purposes but have not come cheap.

So, whilst the idea of cost reductions is admirable it should not be considered the "silver bullet" on its own:

"While there has been considerable push and hype to introduce robotics process automation, front-runners in this space have consistently failed to deliver their desired outcomes, particularly in terms of achieving real cost savings.

The reason for these lacklustre results? Most projects have concentrated on automating micro-processes and eliminating piecemeal individual tasks, rather than addressing the end-to-end finance process using a combination of technologies rather than just robotics." (Kossoras and Reynolds, 2017).

Technologies and their implementation in order to save costs have met with varying results and are fraught with unreliability:

"While these (technology) initiatives have provided the banks with a boost in efficiency, many have reached the point of diminishing returns. Or, upon implementation of these multi-year transformation projects, finance leaders discovered that the planned results are no longer relevant to their shifting operating landscape and bank priorities. They are also finding it hard to understand let alone keep pace with and appropriately leverage — technological innovations that are revolutionizing ways of working" (Kossoras and Reynolds, 2017).

The concept of simply cost savings through increasing technology use is extremely difficult to achieve and there is no single path to success. A combination of complementary strategies (including non-technology related) appears to be the trend of "best in class" rated banks.

Rural banking essentially does not require branches in order to operate, especially in future. Even now, most employees can operate on a bank system effectively from their home office if required. Tools of trade such as work vehicles may be reviewed as to their future essential requirement for the role. However, with the reduction in branches and rural customers still requesting face to face for major transactions at least, the need for them is still considered justified.

As demand for the required skills to suit the future increases, associated costs are also expected to increase. Two examples for staff are either upskilling or needing to pay higher wages to retain staff

with the desired skillsets. But the contrary is also true, whereby back office roles may face reduced salaries and/or wages as their skillsets become less required.

- **7.05 - Customer Experience**

The implications for rural banking around customer experience will be important for banks. The present generations of farmers have always valued face to face interaction, relationships, and bank managers meeting them at the dining table and doing a farm tour to assess how the physical operation is performing.

But will future generations gain more value out of the status quo situation or will their satisfaction decrease as what was perceived as value in the past is now not value at all?

“Analysts at leading firms agree that customer experience is the new battleground to differentiate and compete. After all, a “delightful” and frictionless customer experience yields increased customer satisfaction, loyalty, advocacy and customer lifetime value. One of the biggest Customer Experience (CX) trends in financial organizations around the world is digital transformation, which represents the investment in upgraded technologies, processes and infrastructure to compete for a new generation of connected customers. (Solis, B)

The core of customer experience is the sum of all engagements a farmer customer has with its bank in each touch point, in every key moment of the customer journey, throughout the customer lifecycle. In essence, a rural bank manager may do an excellent job at the kitchen table in terms of adding value, however if the execution of the requested actions is not carried out efficiently, accurately and timely, then the overall rural banking experience will be diminished.

Farmer customer feedback regularly states the high value they presently place upon their relationship with their rural bank manager. There is little doubt that this is one of the key differentiations of what value is placed upon their banking experience. However improved technology has a big future role to play in ensuring that previous “pain points” are minimised or even eliminated. Some examples here right now include electronic loan document signing process and restructuring loan structures online.

But are rural banks really prepared to act and invest in the best interests of the customer? There can be little doubt that improving the customers total banking experience by utilising technology is the right thing to do, but the litmus test is are they prepared to invest accordingly?

“Many companies I’ve learned are customer-centric in principle but not in practice. Truth is, that most of the time, decisions are made in favour of shareholder or stakeholder value over what’s in the best interest of customers.” (Solis B)

Rural banks must also consider the relationship rural customers have with technology and how that changes their standards for service, engagement and experience. For example if they happily fix in interest rates online with retail loans, they are likely to also want to be able to fix in rural loans in a similar way.

A solution could be that a rural customer chooses exactly, at every touch point, how they want to be interacted with. To have the ability to do this could be very powerful. However it must be borne in mind that technology and design can only go as far as the products, services, processes, systems, operations and infrastructure it supports. A smart app interface is of little use if it doesn't do what it proclaims.

The challenge I see with rural banking presently is the "clashing together" of different generations. This is presently confusing investment decisions. Rural banking will possibly err on the side of their existing customers' age demographic and this could lead to existing products and services "done better".

This may work for its traditional customers, but future generations will expect innovation, products and services that unlock new value.

"Disruption either happens to you or because of you, and that's measured by how many innovative and iterative experiences make the old ones obsolete." (Customer experience – Face to Face or integrated? Building a Better Experience in Banking Paper)

- **7.06 - Trust**

Whilst the "older" population still remains wary of emerging technologies, the younger generation is a lot more trusting.

"Consumer behaviour is evolving just as fast. Today, 70% of consumers still trust their bank most with their personal data (Accenture, 2016), but with the digital generation (Generation X and Y) forecasted to represent 70% of the global workforce by 2030 (United Nations, 2017), this precedent will be challenged dramatically over the next decade. In the UK, for example, while more than half (54%) of consumers between 54 and 64 years old would not trust anyone to aggregate their personal account information, only 15% of the 18-to-24-year-old age group feel the same way (United Nations, 2017). Furthermore, in emerging markets, we can expect this process to be accelerated by technology leaps. In Kenya, for example, about 40% of the GDP already takes place on the M-Pesa platform, a mobile money platform created by Vodafone only a decade ago (Runde, 2015)." (WEF GFMS 2018).

These trust issues are being somewhat overcome through the internet and our growing habit of reviewing – even when no direct mechanism is offered.

"Almost 70% of global consumers with internet access post concerns, offer praise or discuss a customer service issue online. (Nielsen 2014). Further, over half of customers now use social media to provide feedback on products they've purchased – a far greater proportion than those who provide feedback directly through the website of a retailer or brand/manufacturer. "(ibid).

New Zealand's rural customers are generally very trusting of the NZ rural banks. However trust is very difficult to gain and easy to lose. This is evidenced by the recent banking issues in 2018 in Australia,

whereby unethical selling of products and services, as well as undue pressure to sell in distressed situations by Westpac, Commonwealth Bank of Australia (CBA), ANZ and National Australia Bank (NAB) has led to a high profile Banking Royal Commission Enquiry. Its preliminary findings are particularly damning to the Banks, which are likely to lose a great deal of trust from their customers.

This loss of trust presents opportunities for competitors to exploit, especially through some digital channels.

• 7.07 - Cybercrime/ attacks

Cybercrime definition is described below:

“Cybercrime also called computer crime, the use of a computer as an instrument to further illegal ends, such as committing fraud, trafficking in child pornography and intellectual property, stealing identities, or violating privacy.” (britannica.com).

Cybercrime (as it relates to NZ Rural Banking) can be categorised as follows:

- Identity theft
- Fraud
- Digital piracy
- Money laundering
- Counterfeiting
- Spam
- Hacking

With the advent of internet banking in New Zealand in 1996 and ensuing digitalisation, an era of opportunities for banks has opened up, to serve customers in new ways. However with the ease of banking operations has come a myriad of threats and vulnerabilities.

“93% of financial institutions suffered security breaches in 2016, with a trend indicative of an exponential growth in cyber-attacks”. (Price Waterhouse Cooper 2016).

The size, scale and scope of cybercrime extends well outside the sphere of New Zealand Rural Banking.

“The ‘WannaCry’ ransom ware attack that is estimated to have affected over 200,000 systems around the world – including systems at Britain’s National Health Service, is still vivid in many of our minds. And WannaCry has already been succeeded by more sophisticated forms of ransom ware such as ‘notpetya’ – although these attacks appear to have been less disruptive. Looking back to just last year, the robbery cyber-heist of the Central Bank of Bangladesh by hackers shows that even central banks and international payment systems can be vulnerable. Nearly USD81 million remains unaccounted for after this attack and, if it had not been for a few spelling errors which caught the eye of officials, the amount stolen could have been closer to USD1 billion.”(RBNZ 2017).

Cybercrime brought about and enabled by new technologies, has had a negative impact on general and rural banking. The negative impact can be highly tangible and could entail physical cash losses/ provisioning for fraud losses. Cybercrime can also contribute to a loss of trust by customers if for example; their accounts get hacked through bank internet systems.

In this sense, Rural Banking is not immune to cybercrime and it presents a major risk to the sector.

- **7.08 - Technological Convergence and Divergence**



Figure 8: Smartphone: an example of technological convergence: Source <https://consumer.huawei.com/en/phones/>

Technological convergence is a term that describes the layers of abstraction that enable different technologies to interoperate efficiently as a converged system. From a practical standpoint, technological convergence encompasses two interdependent areas: technical design and functionality. Technical design is occupied with engineering the underlying infrastructure needed to transport digital content. Functionality refers to the ease of use with which a user can access the same content on various devices. The functional aspects spring from the efficiency of the technical engineering.” -

Using a smartphone to make calls and take digital photos and using your digital TV to perform computing tasks, such as surfing the web while watching a movie, are two more examples of technological convergence.

Additional examples include the internet of things (IoT), converged Bluetooth-connected devices and high-bandwidth Wi-Fi data networks to power intelligent sensors embedded in household appliances, automobiles, thermostats and similar everyday items.

Convergence has many benefits, but also some downsides. It causes issues with privacy; security and cybercrime as a whole range of personal data come together. This makes things easier for criminals.

There is also a limit as to how much can be crammed into a single product. This leads to divergence.

Technological divergence is basically the opposite of convergence. An example of this is the evolution of tablets through the need for media consumption that were bigger than their phones. The reason tablets succeeded was because there was a demand but so supply because the product did not exist.

At this point in time convergence is the key driver of all things. But perhaps there will come a time in future where divergence will be necessitated.

- **7.09 – Decentralisation**

“A more decentralized but interconnected system could be the source of increased risks.”(WEF GFMS 2018).

This type of infrastructure and system may be vulnerable to cyber threats, market exuberance and changing patterns of credit, liquidity, contagion and operational risks. Some people may ask how this differs from the status quo. It may be that it will be extremely difficult to regain some sense of order once a shock has occurred as there are no financial / structural levers to pull by regulatory bodies.

“...free or unregulated banking is “inherently unstable because of market failures arising from such factors as externalities, natural monopolies, and information asymmetry” (Kam Hon Chu , 1996)

Decentralisation is considered a generic risk (potentially brought about by new technologies) and not specific to Rural Banking. In New Zealand the rural banking sector is well regulated at present and it has proven to be resilient (getting through the GFC well in 2008).

Whilst a risk, the NZ government does not seem interested in decentralising the banking industry. Decentralisation would need to come about by, for example, further progression of cryptocurrencies.

- **7.10 - Disruption to existing Rural Banks**

Disruption is the use of technology or new business models to reinvent or reshape an existing business. The original inventor isn't necessarily the disrupter. It's also important to recognise that the disrupter is not immune to disruption itself.

In banking start-ups are taking advantage of new technologies like cloud computing (Xero, Figured), mobile communications (smart phones), digital currency and blockchain to bring new businesses to the market. However, to date start up's have not seriously threatened New Zealand's banks and it is unlikely this will be the case by 2030.

Speed and scale is everything with disruption. It's made possible by internet based platforms in the cloud. They (start-ups) require minimal capital outlay and can be up scaled quickly if they prove popular.

“Some platform companies grow incredibly large yet require very little infrastructure; Airbnb and Uber are great examples. Facebook has a market cap of about \$356 billion and 14,000 employees. General Motors has a much smaller market cap, about \$50 billion, yet it operates 400 facilities on six continents, and has about 215,000 employees. Quite a difference. (Walton 2017).

NZ Banks are more similar to General Motors than Facebook. They have numerous business lines, each supported by legacy strategies and technologies. Siloed divisions may not interact easily, if at all, and top executives face a challenge when seeking to understand everything that's happening across the enterprise and how different business lines affect each other.

So what are banks doing?

- Partnerships – Partnering with startups. This gives banks access to technologies they may have difficulty developing.
- Banks partnering with banks – especially the case with digital currencies and payment services.
- Incubator programs from within – By developing in house banks can anticipate potential concerns and work around them, as well as tailor new products to their needs and those of their customers. This can be difficult to integrate if they buy an “off the shelf” product.

- **7.10 - The Internet of Things (IoT)**

The “Internet of Things” is difficult to get a dictionary meaning for. Generally it is described as a computing concept that describes the idea of everyday physical objects being connected to the internet and being able to identify themselves to other devices.

It is well explained below:

“If we had computers that knew everything there was to know about things – using data they gathered without any help from us – we would be able to track and count everything, and greatly reduce waste, loss and cost. We would know when things needed replacing, repairing or recalling, and whether they were fresh or past their best.”(Ashton K, 1999).

When people think “connected” they think of mobile phones and laptops. However IoT describes a world where nearly anything physical can be connected and communicate. The physical world is becoming like one big information system.

IoT in banking is likely to be used to improve the customer experience, generate cross sell opportunities and generate engaging customer experiences.

From a bank perspective it could be used to improve risk management, reduce costs and improve operational efficiency. Rural banks might benefit from various sensors that monitor the activity and condition of agricultural businesses, such as agricultural sensors that monitor livestock.

Another example could be real-time data feeds which will allow farmers and their banks to continuously and accurately assess the health of the farm’s crops and livestock; and more accurately gauge expected production, property and overall business value. This could result in faster and more accurate decision making for both parties.

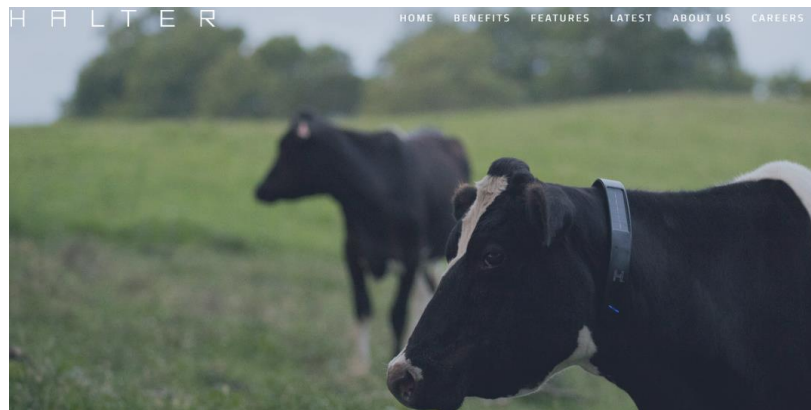


Figure 9: Possibilities for Rural Banking? Halter is a startup company that has invented a GPS collar that feeds information to farmers (and banks?). Source: <https://www.halter.co.nz/>

- **7.11 - Custody of personal data**

The advent of *Open Banking* is in its infancy stages in New Zealand. UK, EU and Australia have already taken steps to promote its growth. It essentially means that customers will have much greater access to their banking personal data, and ability to share it.

“Open banking’ refers to a standardised and secure framework for sharing bank customer data with trusted financial service providers (‘providers’), such as technology companies”. (RBNZ, May 2018)

Payments NZ has been commissioned by RBNZ to trial software that will enable providers to make retail payments on behalf of their customers.

Potentially this opens it up for new providers to offer a wide range of new financial services that are currently the sole domain of banks.

Benefits of open banking include improving the soundness and efficiency of NZ’s financial system by reducing the concentration risk of banks and increasing competition (thus reducing fees and increasing product and service offerings).

However it could also increase risks including weakening bank’s profitability, increased possibility of data mishandling (through more firms), increasing bank’s reputational risks (as customers may hold bank’s accountable for data mishandling), increase money laundering through increased transactions and firms, and increase bank’s capital ratio risks as cash/ savings become more liquid.

Given its early stages it’s very difficult to gauge its impact on rural banking. Whilst the idea will be appealing to many customers, it still has regulatory challenges. It is highly likely to impact other aspects of banking such as international money transfers, foreign currency exchange and crypto currencies. Lending (which is the main income earner for rural banks) has not been targeted to date. It is likely that this is because of issues and costs around bank and lending regulation.

Rural banking should maintain a watching brief on this development though. There is a strong correlation between the number of products and services a bank has and its ability to retain customers. As more products and services are “lost” to a competitor, it’s a strong possibility that the lending aspect of their situation may also be considered.

8.0 Conclusion

The impact of technologies on Rural Banking by 2030 it is expected to bring some major structural changes to the way customers interact with their rural bank. Today's customer experience is highly human interactive and may entail phone or physical meetings supported by a mix of 1970's and 1980's technologies with some modern piecemeal technology thrown in for good measure. The future will be a somewhat different experience.

However there is no template to follow and no clear direction on where to invest or make changes.

There is highly likely to be traditional job losses, however these may well be replaced, even by some form of job role that has not been invented yet.

The increasing competition from Fintech's and Big Tech's is expected to heavily influence rural banking's strategic direction. Their impact may be either direct or indirect.

New Zealand's banking regulatory framework will provide some "protection" from competitors by requiring barriers to entry that competitors may find too expensive or alternative more profitable options may be chosen.

The "decider" in who wins and loses is ultimately the customer.

10. Recommendations

1. Act with urgency - Rural banks need to learn to move much faster. Act now. Decision by committee and decisions that take too long to be made are hindering customer experience and providing an opportunity for a competitor.
2. Invest in Partnerships - Partnering with technology firms can create new distribution channels by improving capabilities in data science and experience design. Rural banking can thrive by cooperating on innovative offerings with Google, Apple, Facebook and others, including local champions (Trade Me). Examples of success are credit card companies and their history of cobranding with airlines, hotels and retailers.
3. Focus more on the lifetime of the customer - Focus more on lifetime customer value rather than in-period “bad” profits. Potential customers such as Amazon have this customer lifetime focus, which includes customers over products, on episodes over functions, on fast test-and-learn over business cases and on customer outcomes over internal consensus.
4. Build the right skills - The human interface will remain extremely important and people with the right skills will be in high demand. Organisations have rated the most important skills for the talent of the future as communication, problem solving, adaptability, agility, and resilience. These skills are less able to be replaced by technology, and will be vital in an uncertain world. These skills are also transportable across industries and roles. Banks must concentrate on employing and retaining these skills and staff must ensure they possess or train for these skills.
5. Start Talking - Rural banks need to start talking to their employees about the future. Many employees are anxious about their future and their job due to automation. Anxiety kills confidence and innovation. Confidence and innovation are two key components to remain relevant and successful.
6. Define your rural technology strategy - Rural banks need to really define where they stand in the technology areas. What do they want to be known for? What role do they want to play in New Zealand agriculture’s future?

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