MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

NEW ZEALAND SECTORS REPORT SERIES ICT Report, 2015

Information and Communications Technology

New Zealand Government

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Minister's foreword

I am delighted to present the 2015 report on New Zealand's vibrant, fast-growing ICT sector

Focused on the IT services sector, the report provides comprehensive information on businesses, employment and skills, investment, innovation, financial performance and the role of the sector in New Zealand's economy.

ICT has fundamentally changed our world. Digital products and services are increasingly embedded in every aspect of our lives – in the things we use and the ways we communicate, travel, live, work and play. The innovative, creative, fast-moving and globally connected firms in New Zealand's IT sector are making the most of the opportunities this presents.

Our growing IT services sector is illustrative of the increased diversity of the New Zealand economy. The development of highly skilled, knowledge intensive sectors such as IT are vital for our economic future.

Since the first ICT Sectors report in 2013, the ecosystem supporting our IT services sector has strengthened. Confidence and excitement in the sector has continued to build and so has attention – and resulting investments – from international investors.

The IT services sector is growing fast. The number of businesses topped 10,000 for the first time in 2014. Employment grew by over 2,800 in the year to June 2014. Exports of IT services have grown at a compound annual growth rate of 14% in the six years to 2014.

Computer services are leading growth in business investment in R&D in New Zealand. Only five years ago the value of listed IT stocks on the NZX was virtually nothing. Currently IT stocks total 10% of the value of all listings.

The Government's Business Growth Agenda sets the framework and actions designed to support the growth of New Zealand's IT exporting sector and the use of ICT across all sectors and regions.

Government actions include establishing new ICT graduate schools in Auckland, Wellington and Christchurch, providing assistance to the industry through Callaghan Innovation and New Zealand Trade and Enterprise, and extending the roll out of Ultra-Fast Broadband fibre to 80% of New Zealanders. We are also establishing a digital economy work programme to support the development of the ICT sector and the use of digital technologies to drive productivity growth in businesses both small and large, and create valuable new economic opportunities for all New Zealanders.

Growth at this speed creates challenges. There is a worldwide shortage of highly skilled IT professionals. More firms in this sector report vacancies, and that vacancies are hard to fill, than any other sector of the economy. Government is working with industry to address this challenge. The ICT graduate schools to be established from this year, will assist in this endeavour.

The 2013 ICT sector report was widely used, not only extensively within New Zealand, but in a surprising number of countries right around the world. I trust the 2015 report will prove equally valuable for investors, businesses, policy makers and students as we work together to accelerate the growth of our IT services sector.

Hon Steven Joyce

Minister for Economic Development
Minister for Regulatory Reform
Minister of Science and Innovation
Minister for Tertiary Education, Skills and Employment;
Associate Minister of Finance

Report objective

The New Zealand Sectors Report Series provides a factual source of information in an accessible format on the key sectors that make up the New Zealand economy. The first series of seven reports was published over 2013–14 and the reports are available from www.mbie.govt.nz.

New Zealand needs to encourage all industry sectors to operate at their peak potential to meet the goals of the Government's Business Growth Agenda.

This report is the first in the second New Zealand Sectors Report Series and provides updated information on New Zealand's ICT sector, with a focus on New Zealand firms developing and exporting information technology services and software.

The report does not intend to draw policy conclusions. Its aim is to provide a comprehensive report card on the state of New Zealand's ICT Sector for business people, exporters, policy makers, media commentators, economists, academics, students and anyone with an interest in New Zealand's economic development.

The Ministry of Business, Innovation & Employment (MBIE) welcomes comment and feedback on this report, and on the measures the Government is taking to facilitate the development of a competitive and successful ICT sector.

Email sectors.reports@mbie.govt.nz.

Contents

Executive summary

General

- The OECD definition of information and communications technology (ICT) captures three important activities in the economy: ICT manufacturing; telecommunications; and information technology (IT) services.
- This report provides updated data on New Zealand's IT services sector only, with a focus on New Zealand's IT services exporting sector.
- The report uses, as the main unit of analysis, the Australia and New Zealand Industrial Classification (ANZSIC) code M7000: Computer System Design and Related Services. This code appears to capture New Zealand's cohort of IT exporting firms.

IT services and product firms

- The combined revenue of the computer system design sector increased by $1.1 billion in the period 2009–2013, to reach $6 billion annually – a compound annual growth rate (CAGR) of 5%.
- New Zealand's IT firms are engaging in significant innovation and generating strong export and employment growth and value creation. Both established and start-up businesses are attracting investment.
- The 2013 ICT report found that IT businesses can be divided into two broad types: those delivering IT services and those developing IT products.
- IT services firms are mainly focused on the domestic market, providing IT infrastructure to medium and large organisations. This group includes many multi-nationals. They are important to the New Zealand economy, enabling large corporates and organisations (such as government departments) to drive efficiencies and develop new products, services or forms of service delivery through the application of ICT. They are critical to driving the digitisation of the economy.
- IT product firms are focused on developing new applications and web-services typically aimed at a particular industry or process. These firms are highly innovative and research and development (R&D) intensive. They are increasingly realising their potential to be significant exporters and build large international businesses.
- In many cases these firms are developing products based around cloud computing and the software as a service business model.

Business and employment

- The number of computer system design firms topped 10,000 for the first time in 2014, with 40 of these employing more than 100 people, eight more than in 2013. Strong employment growth is continuing with the sector adding 7,500 jobs since 2010, with 2,800 of these in the last year alone. Half of these are in Auckland, with a further 27% in Wellington.
- By far the majority of jobs are managerial and technical, with wages and salaries twice the New Zealand average. Firms in this sector report difficulty in recruiting staff, with applicants lacking qualifications and experience being the main reason that vacancies are hard to fill.

Expansion and R&D

- Thirty-eight per cent of computer system design firms invested in expansion in 2013. Thirty-seven per cent invested in R&D, four and a half times the New Zealand average. Firms undertaking R&D invested on average $950,000 in R&D activities, slightly down on 2012. However, more firms undertook R&D overall.

Exports and internationalisation

- A focus of this report is to provide greater insight into the value of internationalising IT businesses to the New Zealand economy.
- Exports of IT services have grown at 14% CAGR in the six years to 2014 to reach $930 million. A portion of these exports will be from other sectors in the economy, such as high technology firms that also deliver software solutions to customers alongside physical products.
- The report finds that a number of metrics should be used to evaluate the value of internationalising IT firms to the New Zealand economy. These include growth in high-paying high skilled jobs in New Zealand, wealth creation for shareholders, stronger international connections through outward direct investment by New Zealand firms, and foreign investment in the New Zealand industry.
- The report also finds that the software as a service subscription (pay-as-you-go) model is gaining significant traction, but it takes a long time for the volume of revenues in absolute numbers to build up to be material, particularly when firms are sacrificing profits to fund growth.
- Of some significance, the number of computer system design firms with off-shore holdings is for the first time greater than the number of firms with foreign ownership. Although this does not reflect the value of these investments, it is nevertheless a very encouraging trend.

Investment

- Eight firms listed on the NZX in the period 2011 to 2014. The value of listed IT stocks on the NZX has grown at a 101% CAGR since 2007. The total market capitalisation as at April 2015 was $7 billion.
- The sector continues to attract venture and early stage investment with a record $29 million invested in 2013.

The digitisation of the economy

- A detailed analysis of the impact of digital technologies on the economy is beyond the scope of this report. Clearly, however, every sector in the economy is impacted by the rapid digitisation of many activities, with some sectors undergoing fundamental changes. The implication is that some traditional occupations and industries will disappear or change radically (as has occurred with the music industry), while new opportunities for value creation and economic growth emerge.
- New Zealand has high rates of individual and business connectivity, but it appears that small and medium businesses have some way to go in using digital technologies to create value and drive productivity improvement.
- In 2014, 74,900 people were employed in ICT related occupations across the economy, 12,600 more than in 2012. Outside of the Professional Services sector (which encompasses computer system design) the highest growth in ICT occupations was in construction (2,590 additional ICT jobs), driven by telecommunications trades workers likely to be employed for the ultrafast broadband roll-out.
- The manufacturing sector employed 560 more software and applications programmers in the ten years to 2014, but shed jobs in ICT occupations overall.

Snap shot: computer system design (ANZSIC M7000)

New Zealand's IT sector is a story of growth and innovation

ANZSIC M7000 is defined as firms engaged in providing expertise in the field of information technology. Includes consulting services around computer hardware programming and software, internet and web design. Also includes customised software development (except software publishing), software installation services and systems analysis services.

Metric	Total	% of New Zealand	Compound Annual Growth rate (different years)	Comment
GDP 2013	$3,085m	1.7%	9.3% (2008–13)	
Exports 2014	$930m	0.75% (goods and services)	14% (2008–14)	Exports have doubled since 2008, adding $514m
Employment 2014	26,690	1.3%	6.5% (2004–2014)	Employment grew 12% in 2013–14 adding 2,870 jobs
Number of firms 2014	10,251	2%	3.5% (2004–2014)	The sector added 8 firms with 100+ employees in 2013–14
Value added per employee*	$181,716	133% of the New Zealand average	n/a	High productivity
Business investment in R&D 2014	$311m	25%	13.2% (2004–2014)	Almost all growth in business expenditure on R&D is driven by computer services
ICT occupations in all New Zealand sectors 2014	74,900	3.8%	3% (2004–2014)	All sectors employ workers with ICT skills

*This is an experimental analysis. Data sources are the Annual Enterprise Survey, the Quarterly Employment Survey, and the Linked Employer Employee Database. Value added is nominal. As such, productivity has been produced as a point estimate for 2012 (the most recent year where we have data required to calculate the employing industries number). FTEs are estimated from QES and LEED data. QES calculates FTEs as a sum of all full-timers plus half the part-timers. As such, it can be heavily influenced by shifts in workforce and time spent on labour. It also doesn't include working proprietors.

Key themes: New Zealand industry

A number of key themes emerged in the ICT sector

Theme	Description	Details
Increased investment	ICT sector attracting increasing interest from angel, venture and private equity investors and on the NZX.	Eight firms identified as part of the IT sector have listed on the NZX since 2011. IT firms now account for around 10% of the NZX's market cap. IT and software firms have attracted 31% of New Zealand's venture and early stage investment in the last five years; with a record $29 million invested in 2013 in start-up and early stage companies.
Demand for skills	Increased use of ICT across the economy generating employment growth across a range of skill-sets, including software engineering and development, project managers, marketers, sales, administrators and business analysts.	More computer system design firms reported vacancies than any other sector in the economy; 89% of the vacancies were for managers or professionals and technicians.
R&D and innovation	Information and communications technologies providing platform for innovation across all sectors.	Computer services firms driving growth in business expenditure on R&D in New Zealand, and now account for 25% of the total business expenditure on R&D, up from 13% ten years ago.
Uncapped data plans and UFB	Internet service providers offering uncapped broadband plans, connections to the ultra-fast broadband fibre (UFB) network taking off.	The latest OECD Broadband Portal penetration statistics show New Zealand is now number one among developed countries for annual growth of fibre connections from June 2013 to June 2014, with an annual growth of 272%. New Zealand now ranked 15th out of 34 OECD countries for fixed broadband subscriptions, up from 22nd in 2004. Consumers choosing plans with higher data caps, or increasingly unlimited data.
Mobile connectivity	Rapid uptake of smartphones, tablet computers and other mobile devices.	Mobile broadband connections topped 3.7 million in 2014, equivalent to 82% of the population.
Developing capabilities	New Zealand companies gaining experience and building local and international business networks in support of export growth.	New Zealand is developing a modern and outward looking technology innovation system, as indicated by listings on the NZX, specialist technology law firms, serial entrepreneurs, incubators and innovation hubs, strengthening international connections and networks, high profile investors, and Government initiatives such as the ICT graduate schools and Callaghan Innovation.

Key themes: technology

The pace of technological change is increasing, driving change in all sectors; just two of a myriad of trends are addressed here*

Theme	Description	Details
Everything going digital	All economic and social activities becoming digitised or digitally enabled, challenging legal frameworks and impacting the structure of industries, the nature of work and more.	The initial digital tsunami hit between 2000 and 2010 and saw CD sales swamped by iTunes downloads and high street book sales hit by United States retailer Amazon. But the second wave is affecting all business, Sharp says. "Everybody is either going to be disrupted or needs to have a growth strategy... it's disrupt or defend" Source: Roger Sharp, Chairman, Asia Pacific Digital, quoted in Business Models Collide, Sunday Star-Times, April 19, 2015. ...the price trends [for dairy exports] combined with the tendency for online selling to be used to drive prices down – as with the Akurala infant formula launched by Synlait and New Hope in China last week – suggest the [dairy] industry has some quick work to do to stay ahead of the game. Source: New Zealand Herald, April 15, 2015. New Zealand broadcasters have confirmed they've launched legal proceedings against internet service providers who give customers' access to "global mode", which allows customers access to offshore online content, claiming it breaches the local content providers' copyright. Source: New Zealand Herald, April 20, 2015.
Cyber security/privacy	Big data enabling governments and businesses to analyse and track individual behaviour. Ubiquitous use of electronic technology for all activities and functions increases vulnerability to cyber attacks and security breaches.	The threats to New Zealand's national security have continued to intensify. They come not only from state actors but also from transnational criminal groups. The cyber threat to New Zealand's national prosperity is real and continues to grow in sophistication and impact. Source: New Zealand Intelligence Community website www.nzic.govt.nz. The New Zealand National Cyber Security Centre provides enhanced services to government agencies and critical infrastructure providers to assist them to defend against cyber-borne threats. Source: The National Cyber Security Centre website www.ncsc.govt.nz. The Civil Aviation Authority is tightening safety rules for the use of drones – but has no powers to protect people's privacy. Source: Radio New Zealand News, November 2014.

*For digital trends in 2105, see www.forbes.com or any number of other sites and commentators.

SECTION 1

Scope of the report: IT services and IT product businesses

Scope of this report

A range of activities are captured by the OECD definition for ICT*; this report focuses only on the largest IT services sub-sector: computer system design and related services

The OECD definition of information and communications technology (ICT) aggregates three important but very different activities in the economy: ICT manufacturing, telecommunications and information technology (IT) services.

Aggregating the data across three types of industries hides the true story, that is, the rapid growth of New Zealand's software (IT services) sector. As more social and economic activities become digitally enabled, the boundary between what could or could not be classified as 'ICT' is increasingly blurred. Arguably there is no such thing as the 'digital economy'. What we are seeing is the digitisation of the economy.

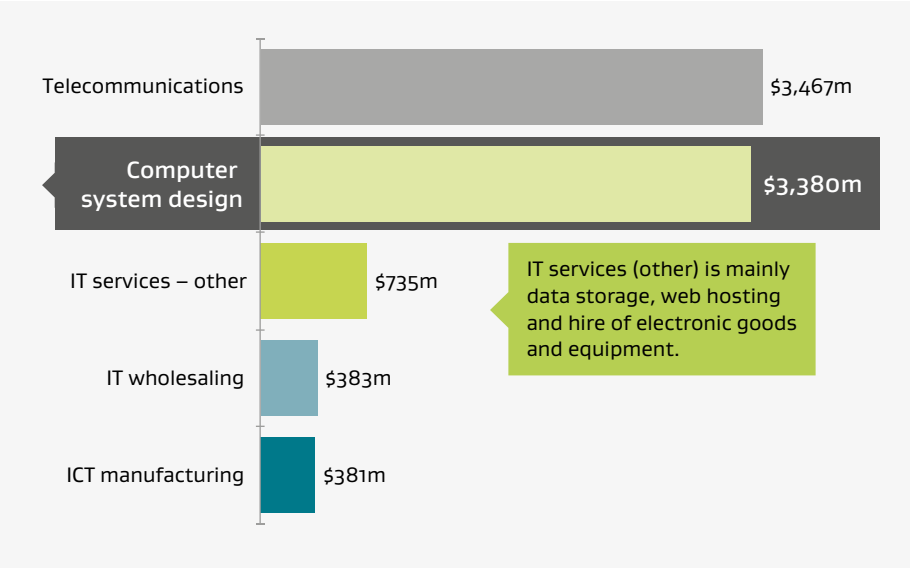
For this reason this report focuses mainly on New Zealand's growing cohort of information technology services and product firms, with a particular interest in the growing number of these firms that are expanding internationally, exporting and creating high value jobs.

The report uses as its main unit of analysis the Australian and New Zealand Standard Industrial Classification(ANZSIC) code **M7000: Computer System Design and Related Services**.

Computer System Design captures firms engaged in providing expertise in the field of information technology. It includes consulting services around computer hardware programming and software, internet and web design. It also includes customised software development (except software publishing), software installation services and systems analysis services.

As such the assumption is made that this classification captures by far the majority of New Zealand's internationally focused IT firms. The various data-sets available using this code indicate a sector that is experiencing strong growth and is increasingly well connected to international markets.

Relative size by GDP of sectors captured by OECD definition of ICT
NZ$: millions, 2013



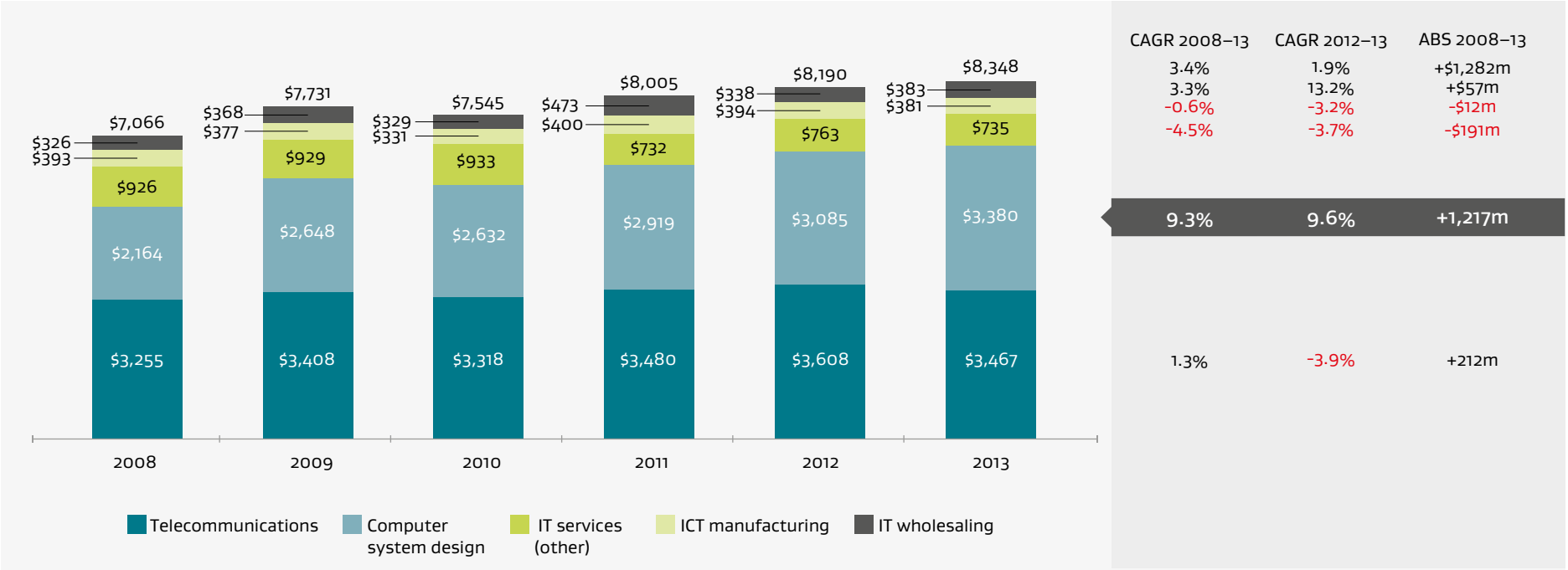
Source: Statistics New Zealand; MBIE analysis.

*See Appendix for ANZSIC codes captured by OECD definition of ICT.

Contribution to GDP by ICT sub-sector

ICT's contribution to GDP grew by $1.282 billion in the five years to 2013; almost entirely driven by computer system design (plus $1.2 billion)

ICT contribution to GDP by sub-sector
NZ$, millions, 2008–2013



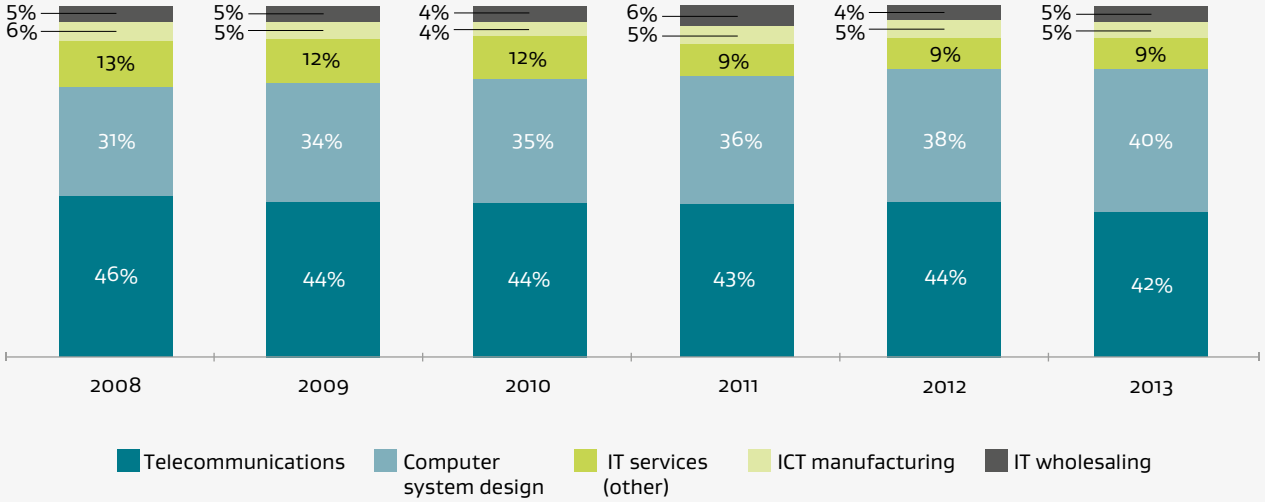
	CAGR 2008–13	CAGR 2012–13	ABS 2008–13
Telecommunications	3.4%	1.9%	+$1,282m
Computer system design	3.3%	13.2%	+$57m
IT services (other)	-0.6%	-3.2%	-$12m
ICT manufacturing	-4.5%	-3.7%	-$191m
Total	**9.3%**	**9.6%**	**+1,217m**
IT wholesaling	1.3%	-3.9%	+212m

Source: Statistics NZ, custom job.

Contribution to GDP by ICT sub-sector

Computer system design made up 40% of ICT GDP in 2013, up from 31% in 2008

ICT contribution to GDP by sub-sector
NZ$, millions, 2008--2013



Source: Statistics NZ, custom job.

Business types in computer system design

Two types of IT businesses in computer system design can be identified: product businesses and service businesses

IT product businesses

1. High-margin, high-growth potential businesses.
2. Typically focused on developing applications or products focused on a specific sector (e.g. health), or specific business operation (e.g. accounting) or a specific service (e.g. online auctions).
3. These businesses can be established and a product launched with a relatively small amount of capital, as the key assets are intellectual property and human capability.
4. Such businesses have the capacity to scale rapidly if the product is proved in the market, although this takes significant additional capital.
5. Staff requirements are low when compared to the value created.
6. These businesses have the potential to create significant value and appear to be driving the sector's exports and international footprint, e.g. establishing off-shore offices and subsidiaries.

IT services businesses

1. High-value, high-volume, low-margin business.
2. Typically larger firms that provide professional and IT infrastructure related services for medium to large corporates or other organisations, e.g. government departments.
3. Systems are built primarily using well-known technologies from Microsoft, Oracle, SAP and similar.
4. Largely focused on the New Zealand market.
5. Most well-known multinational IT services firms operate in this space in New Zealand.
6. These firms are important as they support the digitisation of the New Zealand economy, through supporting government and businesses to do business electronically.
7. Some New Zealand owned firms, such as Datacom, have expanded internationally, particularly in Australia and Asia.

IT services firms

Most global multinational IT services firms operate in New Zealand and there is a strong cohort of local firms

Selected examples of IT services firms operating in New Zealand

Example firms	Services
Datacom (NZ, private)	Provides a full range of IT services such as IT management, software development, business applications, websites, intranets, infrastructure outsourcing and data centres. Significant business in Australia, Malaysia and the Philippines.
Fronde systems (Listed, NZX)	Designs, builds and integrates software solutions particularly for large organisations, e.g. government departments. Also operates in Sydney and Canberra.
Fujitsu (Multinational)	Provider of IT products and services, including hardware, software, networking and business solutions, and more.
IBM (Multinational)	Full range of IT products and services.
Optimation (NZ, private)	Services include development and integration, web enabled business, consulting, testing, outsourcing, managed resource services and software support.
Intergen (Empired Limited, listed, ASX)	Provides a range of IT solutions for business, including provision and support of Microsoft-based solutions. Acquired by Australian listed firm Empired Limited in 2014, The acquisition created Australasia's largest Microsoft business solutions provider. Intergen Group CEO Tony Stewart says, "We have been growing Intergen's operations in Australia for several years, and this deal accelerates our vision to become Australasia's leading Microsoft provider."
Unisys (Multinational)	Full range of IT products and services.

IT product firms' business models

Broadly speaking, there are two business models IT products firms employ; 'software as a product' and 'software as a service'

Software as a product

Description	Revenue model
A software product or suite of products that provide a solution for managing some aspect of an enterprise and typically hosted and managed by the customer. Typically customer (a firm, hospital, government agency) will contract the vendor to install the solution on the customer's IT system. May require significant work in implementation, customisation and training. Examples include: › Orion Health's Rhapsody Integration Engine. › Wynyard Group's Risk Management Platform. › WhereScape 3D.	**Licence revenue** One-off licence fees from perpetual licence sales. **Implementation services** Fees for installing and customising software solution and training in maintenance and use. **Support services** Recurring fees for ongoing service and support. **Subscription revenue** Software as a product firms are increasingly moving from the 'one-off licence' model to a recurring subscription model, similar to software as a service.

Software as a service

Description	Revenue model
A software product or suite of products which is centrally hosted in the cloud and is typically accessed through a web browser. Examples include: › Xero, accounting software for small enterprises › Vend, point of sale software for retailers › SLI systems, search software for ecommerce websites › GeoOp, management software.	**Recurring subscription** Typically a monthly subscription for a licence to access and use the software application. Subscription charges may be per business, per number of users and/or additional charges for premium features.

Note: social media, free online services
Social media sites and free online services such as Google Docs effectively operate a software as a service model, but derive revenue through advertising.

Note: the above are simplified. Firms may operate a number of different models for different parts of the business, or hybrid models.

IT product firms

New Zealand IT product firms typically focus on developing products that exploit a niche opportunity; many are expanding internationally

Selected examples of IT product firms operating in New Zealand

Firm	Industry/niche targeted	Services
Vista Entertainment Solutions (Listed, NZX) Market capitalisation as at 9 April 2015 $363m	Entertainment industry, particularly multiplex cinemas	The Vista Group is a global leader in film industry software solutions that comprises six businesses; Vista Cinema; Veezi; BookMyShow; MACCS; Movio; and Numero. Leading market position in the Large Circuit Market, with a global market share of approximately 37% across 60 countries.
Parts Trader (Private)	Automotive industry	Online web-based marketplace that allows automotive trade parts buyers to find the right parts from parts suppliers.
Wynyard Group (Listed NZX) Market capitalisation as at 9 April 2015 $290m	Intelligence and security	Risk management and advanced crime fighting software used in investigations and intelligence operations by government agencies and financial organisations. More than 100,000 users of its solutions and offices in the US, UK, Canada, United Arab Emirates, Australia and New Zealand.
Xero (Listed, NZX) market Market capitalisation as at 9 April 2013 $3.3b	Small businesses	Provides accounting software in the cloud by subscription. Operates software-as-a-service business model. Offices in Melbourne, Sydney, Brisbane, San Francisco and Milton Keynes.
Serko (Listed, NZX) Market capitalisation as at 9 April 2015 $65m	Travel industry	Cloud-based travel booking and expense management software focused on Australasian market and expanding into Asia.

IT product firms *continued*

Firm	Industry/niche targeted	Services
Vend (Private/VC)	Retail point of sales	Cloud-based point-of-sale software that lets retailers process sales and track inventory on both specialist point-of-sale hardware and common computing devices such as iPads. 10,000 users in over 100 countries. Raised US$20m venture capital in 2014, from US and Australian investors, including Paypal co-founder and Xero investor Peter Thiel and Australia's Square Peg Capital.
Foster Moore (Private/VC)	Public sector	Specialist developer of electronic registries including Catalyst The Registry Manager, Catalyst Adoption Methodology and the cloud-based Registry as a Service. Has designed and built over thirty different types of register, from relatively simple registers of motor vehicle traders to highly complex radio spectrum management registers.
ARANZ Geo (Private)	Mining, geothermal and hydrogeology	Core product is the Leapfrog® 3D geological modelling software for the mining, hydrogeology and geothermal industries. ARANZ Geo has a network of Local Support Offices throughout the world, sited close to major mining areas including Canada, US, Peru, Chile, Denmark, Turkey, South Africa and Australia.
Gentrack (Listed, NZX)	Utilities and airports	Specialist billing, customer relationship management and revenue assurance software solutions for energy and water utilities, heating schemes and airports. Also provides business and industry consulting and project management services. Offices in Australia, US, and UK.
Diligent Board Member Services (Listed, NZX) Total market capitalisation as at 9 April 2015: $476m	Corporate governance	Provides directors with access to board papers in the cloud, through a bespoke portal, Boardbooks. Operates software-as-a-service business model, income listed as 'licensing revenue'. 82,600 users globally. Headquartered in US; offices in New Zealand, UK, Germany, France, Australia, Singapore, Canada, Brazil, and Hong Kong.
For a comprehensive list and profiles of New Zealand's IT product firms (and technology firms more generally) see the TIN 100, www.tinetwork.co.nz		

Industry comment

Industry commented on the trend to software-as-a-service

Change through cloud technology has been very fast. . . and the impacts are only going to get bigger. The world economy is now much more integrated than it once was, with people communicating face to face and working on the same data, real time, from anywhere in the world. [Our company] is an example of how effective this is – with just under half of our people working overseas we are truly a global and highly integrated company.

Executive, IT firm (large)

Software as a service is the clear future. I believe the development of software as a service offerings in New Zealand will improve as Internet performance improves, especially in rural areas. I believe there are great opportunities in rural sectors where ICT has a huge growth potential for the foundation of global high tech farming solutions.

ICT entrepreneur

Cloud-based everything – SaaS, PaaS, IaaS, etc. It has gotten to the point that if you can imagine an enterprise solution going into the cloud, whatever system that may be, it will.

Source: 20 Digital Trends For 2015, Forbes.com

Emerging sector scorecard: computer systems design

It takes time for an economy to develop the capabilities required to succeed in a new activity; across a range of metrics New Zealand's IT export sector is gaining traction

Market	
Angel investment	Improving
Large number of firms	Improving
Firms building scale	Improving
Foreign investment	Improving
Outward investment	Improving
Firms listing on NZX	Improving
Job growth	Yes
Salaries/wages	Yes

Ecosystem	
Skills supply	Lagging[1]
International connections	Improving[2]
Spin-outs/start-ups	Increasing
Incubators	Yes
Specialised media/awards	Yes
Serial entrepreneurs	Increasing
Access to experienced management	Improving
Access to experienced governance	Improving

Knowledge intensity[3]	
R&D rate	High
Innovation rate	High
Labour force skill level	High
Salaries/wages	High
Rich country activity[4]	Yes
Product complexity high	High
Productivity	High
Workforce qualifications/skill level	High

Key:

- Strong
- Medium
- Weak

1 A problem generated by growth in demand.

2 E.g. high profile US investors backing New Zealand firms.

3 From an economic development point of view, it is important that New Zealand builds strengths in knowledge intensive activities as well as enhancing existing strengths.

4 The kind of complex product or service typical of wealthy developed economies.

Industry comment

Industry commented on the growing maturity of New Zealand's technology ecosystem

My sense is that the quality of governance in New Zealand for ICT has improved significantly, if only through experience and education during the last 15 years. Certainly there is a more experienced group of directors that have come through the ICT sector and are now able to add their experience to the boardroom table. This was not the case 15 years ago. There is still work to be done on educating start-ups on the value of good governance, but generally acceptance of the need is more prevalent.

Investor and mentor

Management. I think that's still a weakness, particularly access to management with international experience. Also access to experienced directors is definitely an issue, as is gender imbalance in the director pool.

Partner, technology law firm

The ecosystem for support and promotion of innovation and entrepreneurship has grown massively. There is considerable angel and private equity activity, which is perhaps not being captured in surveys. The biggest change I have seen is a huge lift in aspiration and a 'give-it-a-go' attitude from a new generation of ICT entrepreneurs. The growing number of incubators, entrepreneurship programs and seminars are a part of this, but I suspect they are as much a result of demand generated by young New Zealanders becoming aware of the potential for success through global social media and seeing other Kiwis do it.

ICT entrepreneur

We've got some great IT businesses here in Wellington – the high profile likes of Trade Me and Weta Workshop. But we also have BNZ technology, Spark, Kiwibank, InterGen and numerous start ups. There is a hub in Wellington and we can really build on that through networking events, awards and other events and environments that promote the exchange of ideas. Outside Wellington companies like Vend, Pushpay, and eRoad, to name but a few, are all pushing New Zealand's tech credentials. Focussing on a region is short sighted, though, and this really needs a national focus.

IT executive

I am not sure if the numbers have been measured but almost every successful New Zealand entrepreneur (and many new immigrants) I have met re-invest heavily into New Zealand start-ups. I myself have invested in six directly and many more indirectly. However, perhaps one of the more important values is more qualitative – that of the aspirational energy created.

Serial entrepreneur

Innovation hubs are emerging

Public and private stakeholders are working together to establish state-of-the-art technology innovation hubs

Auckland's journey to become an innovation hub of the Asia-Pacific region and a high-tech economy took a big step forward today with the opening of GridAKL – Auckland Council's innovation precinct at Wynyard Quarter.

GridAKL will make a major contribution to Council's vision to develop Auckland businesses which are 'born global', are faster growing, employ more Aucklanders in high-paid jobs, and generate export dollars for the region's economy. GridAKL's first stage is the refurbished Polperro building overlooking the Viaduct Basin, part of a $20 million multi-year Council investment in an innovation precinct for ICT and digital media companies, and a central hub for Auckland's growing innovation corridor.

Nearly 10 high-tech start-up companies have already moved, or are close to moving, into GridAKL's co-working environment which will be supported by business incubation services and activation.

Source: www.waterfrontauckland.co.nz.

EPIC (Enterprise Precinct Innovation Centre) Christchurch serves as a bridge between innovation focused companies of all sizes. Connecting business with investors, Governments and technology hubs around the world, whilst fostering a collaborative environment for Christchurch business and social communities to work together.

Since the building first opened in October 2012 EPIC has played host to hundreds of functions, public events take place every week, collaborative projects between tenants have leaped from the woodwork in all directions, we have tenants who've reported revenue 100% ahead of years prior to moving into EPIC, some even experiencing as much as 400% growth.

Source: EPIC website: www.epicinnovation.co.nz.

The go-to place for Wellington's innovative tech community to connect, collaborate and generate new and exciting ideas is a step closer with the establishment of a Tech Hub by Wellington City Council. The Tech Hub will be a forerunner to the development of a tech precinct, one of the key projects that the Council is investigating as part of its economic growth agenda. The Tech Hub will bring together the wider tech community and encourage more collaboration, knowledge transfer and idea generation, leading to greater levels of innovation and GDP growth in Wellington.

Councillor Jo Coughlan, Chair of the Economic Growth and Arts Committee, says the tech precinct is a key initiative supporting the Council's economic development and digital strategies. "It also gives us greater opportunities to work with tech hubs in Auckland and Christchurch to attract talent and investment to New Zealand."

Source: www.scoop.co.nz.

SECTION 2

The Government's Business Growth Agenda

Actions to support ICT innovation

Encourage and enable business innovation

- Support the ongoing development of Callaghan Innovation and implementation of its full range of services, including the ICT National Technology Network.
- Actively encourage more multinational companies (MNCs) to conduct research in New Zealand.
- Maximise the competitiveness of the New Zealand business environment to encourage innovation.
- Investigate and encourage the development of Innovation hubs and precincts.

Increase the impact of the Government's investment in public research

- Increase and reform contestable research funding, increased by $56.8m over three years from 2015/16.
- Develop more effective performance monitoring of outcomes from public science investment.
- Develop an international science and innovation strategy.
- Finalise the National Statement of Science Investment.

Make the most of the digital economy

- Establish a digital economy work programme to support the development of the ICT sector and increase the uptake and smart use of ICT across the economy.
- Deliver faster broadband to 97.8% of New Zealanders, with 80% getting Ultra-Fast Broadband through fibre by the end of 2019.
- Roll-out the expanded Rural Broadband Initiative to deliver high quality broadband and increase connectivity.
- Allocate funding for an anchor tenancy on a second trans-Pacific cable.

Callaghan Innovation

Established in 2013, Callaghan Innovation is the Government's Hi-tech HQ for businesses, with a mandate to help grow the level of research and development by businesses across New Zealand.

Callaghan Innovation connects businesses with the expertise and facilities they need at research organisations across the innovation system; operates its own research and technology laboratories and specialist equipment in support of hi-tech businesses; and manages more than $160 million a year in government funding and grants to support business innovation.

Callaghan offers specialist research and technical services for the ICT sector and operates an ICT R&D National Technology Network, supported by a dedicated Network Manager.

Twenty-three per cent of the value of Callaghan Innovation R&D grants awarded in 2013/14 went to ICT businesses, with a further 54 per cent to manufacturing businesses, many of which will be investing in integrating ICT into processes and products.

Other Callaghan Innovation services include the Accelerator Programme, designed to support the rapid formation of early stage ICT and digital technology start-ups, and the Incubator Support Programme, which encourages the development of early stage, high-growth businesses to generate employment growth, commercialise intellectual property and grow emerging sectors. This includes support through the Repayable Grants for Start-ups Programme.

Callaghan is made up of a team of 400 researchers, scientists, engineers, technologists, investment managers and account managers, working across the country.

See www.callaghaninnovation.govt.nz.

Actions to improve skills availability and intellectual property settings

Growing the innovation workforce

- Establish new ICT graduate schools in Auckland, Wellington and Christchurch.
- Increase investment in engineering studies at tertiary institutions and lift graduate numbers by 500 per annum by 2017.
- Collect and provide better information on career prospects to students and the tertiary sector.
- Highlight innovation careers in science, design, engineering and maths to school students and their families.
- Review the Careers Information system to enable young learners to make better-informed choices, particularly at points of transition.
- Lift Māori student participation in STEM-related career pathways.

Strengthening tertiary education

- Implement the new Tertiary Education Strategy.
- Publish employment outcome information and likely industry demand indicators, to better inform prospective students about study choices.
- Investigate options to strengthen university governance to encourage greater responsiveness to skill needs and economic opportunities.
- Support Canterbury public tertiary institutions to recover their position in the tertiary system and help lead the Canterbury recovery.

Attracting skilled migrants

- Review the Essential Skills in Demand lists, to examine their effectiveness in addressing skills shortages in the short- and long-term.
- Review investor, entrepreneur and worker policy settings with a view to attracting migrants with the right skills and capital to invest.
- Hold Kiwi expat Job Fairs.

Improving intellectual property settings

- Create a single trans-Tasman patents examination regime with Australia to simplify patent applications.
- Investigate whether the intellectual property settings of public institutions are optimal for technology transfer.

Actions to support exporters and businesses looking to expand internationally

Strengthening high-value manufacturing and services exports

- Develop new services to help New Zealand companies, including SMEs, increase their success in government procurement, complex supply chains and large contracts.
- Establish mechanisms to secure commercial export opportunities on the basis of core public sector intellectual property and expertise.
- Identify key issues for commercial service exporters and promote export prospects.

Making it easier to trade from New Zealand

- Complete Trade Single Window for importers and exporters.
- Use the NZ Export Credit Office to help promote the procurement of New Zealand capital goods and services.
- Implement Immigration Global Management System upgrade and network configuration.
- Conduct fit-for-purpose checks on market facing regulatory regimes.

Helping businesses internationalise

- Provide NZTE with more resources to help more companies internationalise, lifting the number it engages with intensively to 700 by June 2016.
- Accede to the WTO Agreement on Government Procurement to enhance market access opportunities overseas for New Zealand suppliers.
- Adapt New Zealand's offshore footprint to better meet the needs of business.
- Target efforts to address behind the border barriers in key markets, maintain existing market access and promote FTA uptake.
- Embed the New Zealand Story strategy and structure.

Actions to improve investment and access to capital

Attracting foreign investment and supporting investment in the regions

- Develop and implement a 'New Zealand-wide' Investment Attraction Strategy. This strategy will focus on three key priority areas:
  - Attracting high-value Foreign Direct Investment in areas of competitiveness for New Zealand.
  - Attracting investment in research and development in New Zealand, especially from multi-national corporations.
  - Expanding New Zealand's pool of 'smart' capital by attracting high-net-worth individuals and entrepreneurs to reside in New Zealand.
- Supporting the development of regional and Māori investment opportunities.

Strengthening equity markets

- Embedding and monitoring the reforms to financial markets regulation.
- Review the Financial Advisers Act 2008 and Financial Services Providers Act 2008.
- Deliver programmes to improve New Zealanders' financial and investor literacy.
- Deliver an Asia Region Funds Passport to allow a managed fund based in one jurisdiction to be offered more easily to investors in other participating jurisdictions.
- Support options for lower-cost public listings.

Access to capital

- Licensed crowd-funders and peer-to-peer lenders can now operate, offering new ways for firms to raise capital.
- Improvements now make it easier for firms to offer employee share schemes, primarily by reducing the disclosure requirements needed.
- Increased access to capital for small, high-growth businesses has been supported through underwriting the New Zealand Venture Investment Fund by a further $60 million.
- NZTE launched Better By Capital in 2013 to deliver targeted services to help internationalising New Zealand firms raise capital.

See *Business Growth Agenda Future Direction 2014* publication for full details, available from www.mbie.govt.nz.

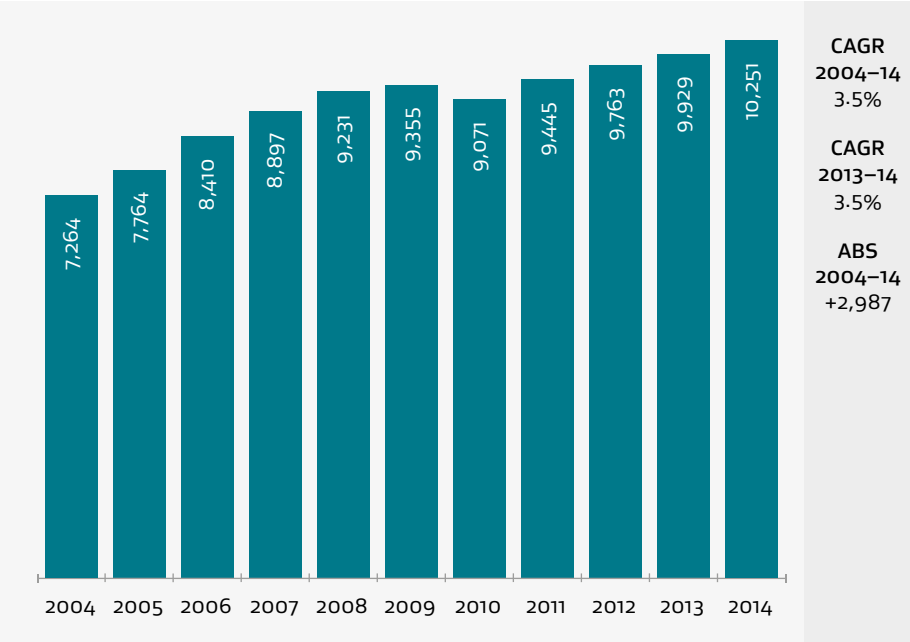
SECTION 3

Business and employment

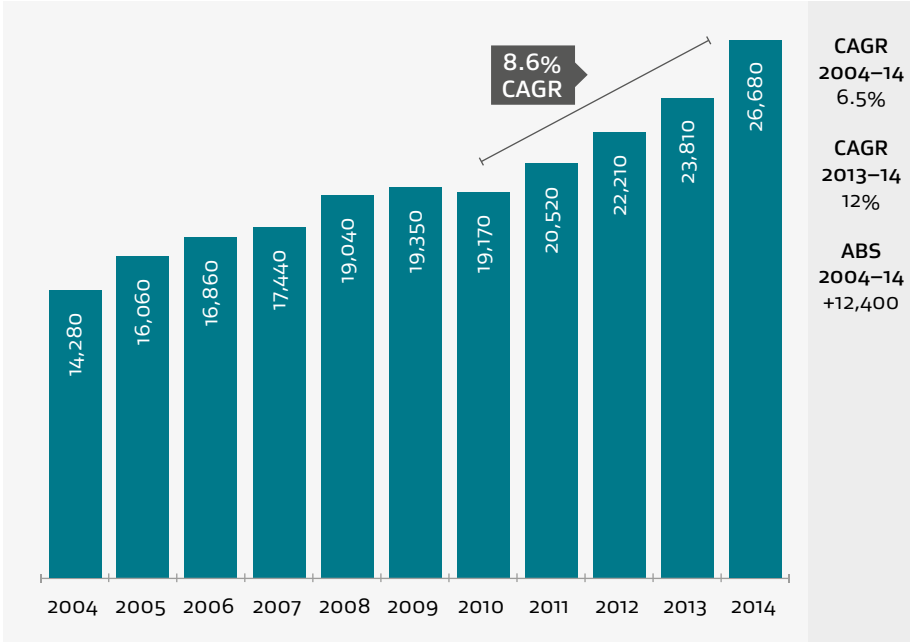
Firms and employment

The number of computer system design firms topped 10,000 for the first time in 2014; strong employment growth is continuing

Number of firms (includes firms with no employees)
Firms; 2004–2014



Number of employees
Employees; 2004–2014



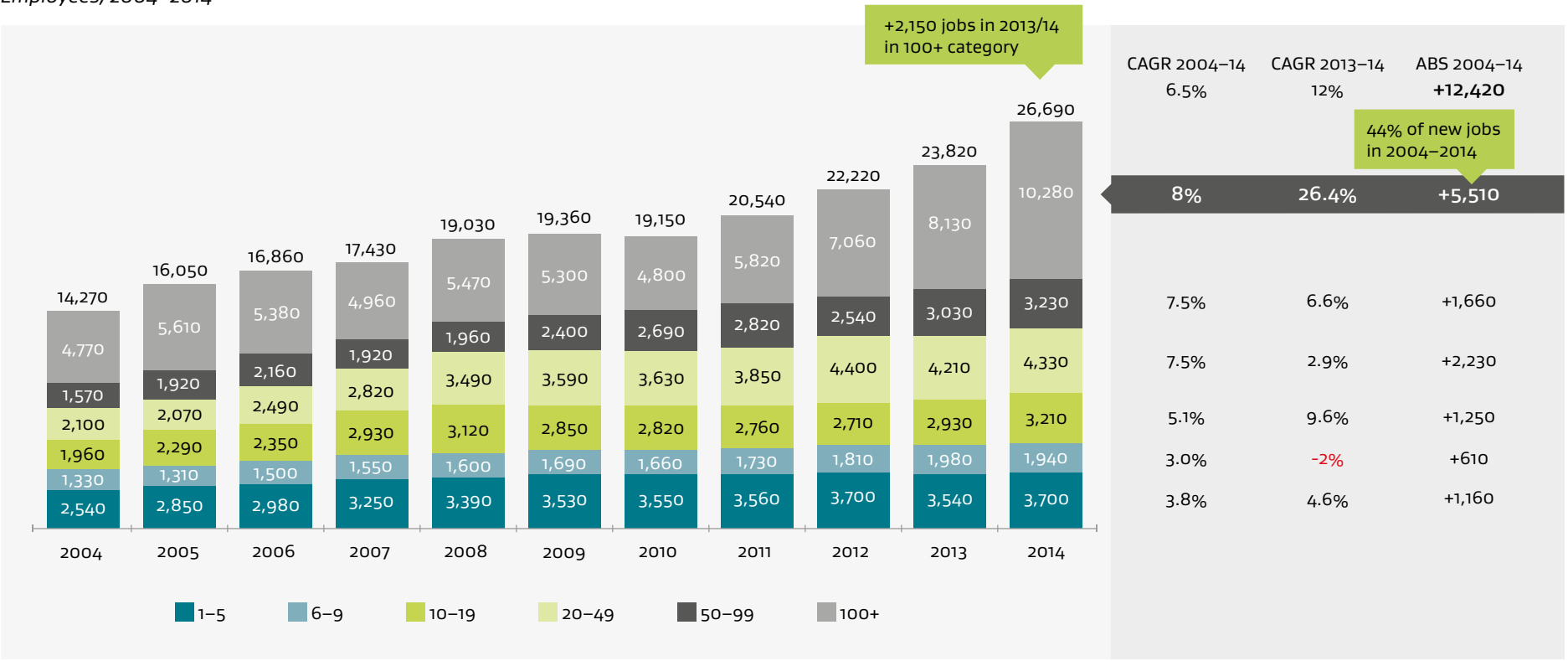
Statistics New Zealand Business Demography Statistics, 2014.

Employment by firm size

Large firms (100+ employees) are driving employment growth, adding 44% of all new jobs in the ten years to 2014

Number of employees by firm size

Employees; 2004–2014

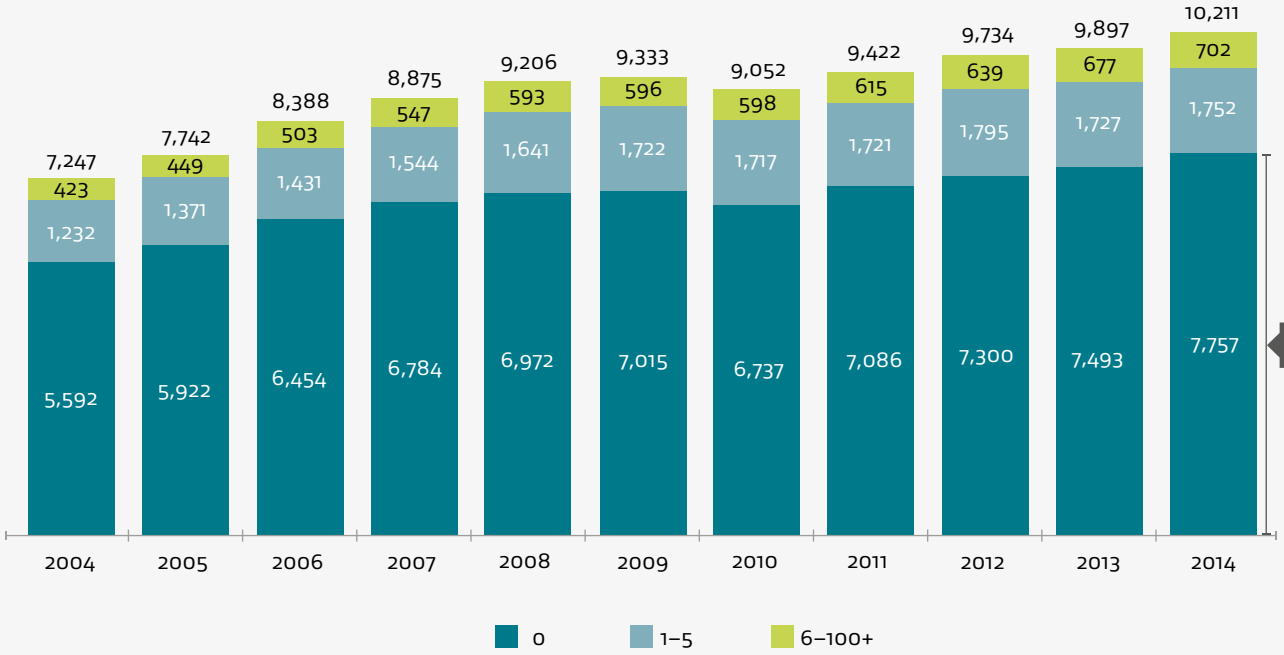


Note: totals may not match other pages due to rounding; Source: Statistics New Zealand Business Demography Statistics, 2014.

Small firms by employment size

76% of firms have no employees; these are likely to be private contractors

Number of firms by employee numbers (firms with six or more employees aggregated)
Firms; 2004–2014



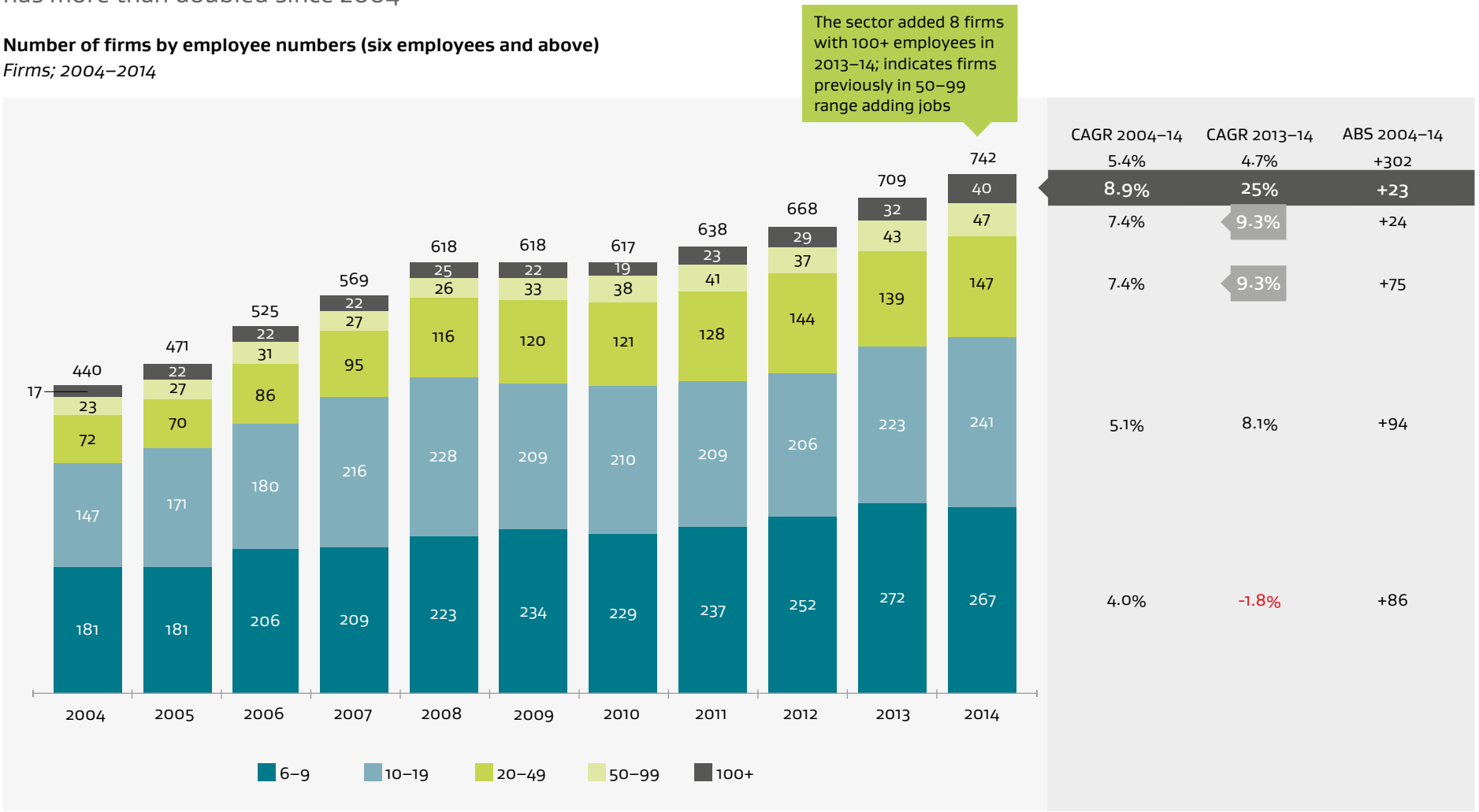
	CAGR 2004–14	CAGR 2013–14	ABS 2004–14
	3.5%	3.2%	+2,964
	5.2%	3.7%	+279
	3.6%	1.4%	+520
76%	3.3%	3.5%	+2,165

Note: totals may not match other pages due to rounding; Source: Statistics New Zealand Business Demography Statistics, 2012.

Medium–large firms by employment size

Numbers of medium and large firms have shown strong growth since 2010; the number of large firms (100+ employees) has more than doubled since 2004

Number of firms by employee numbers (six employees and above)
Firms; 2004–2014

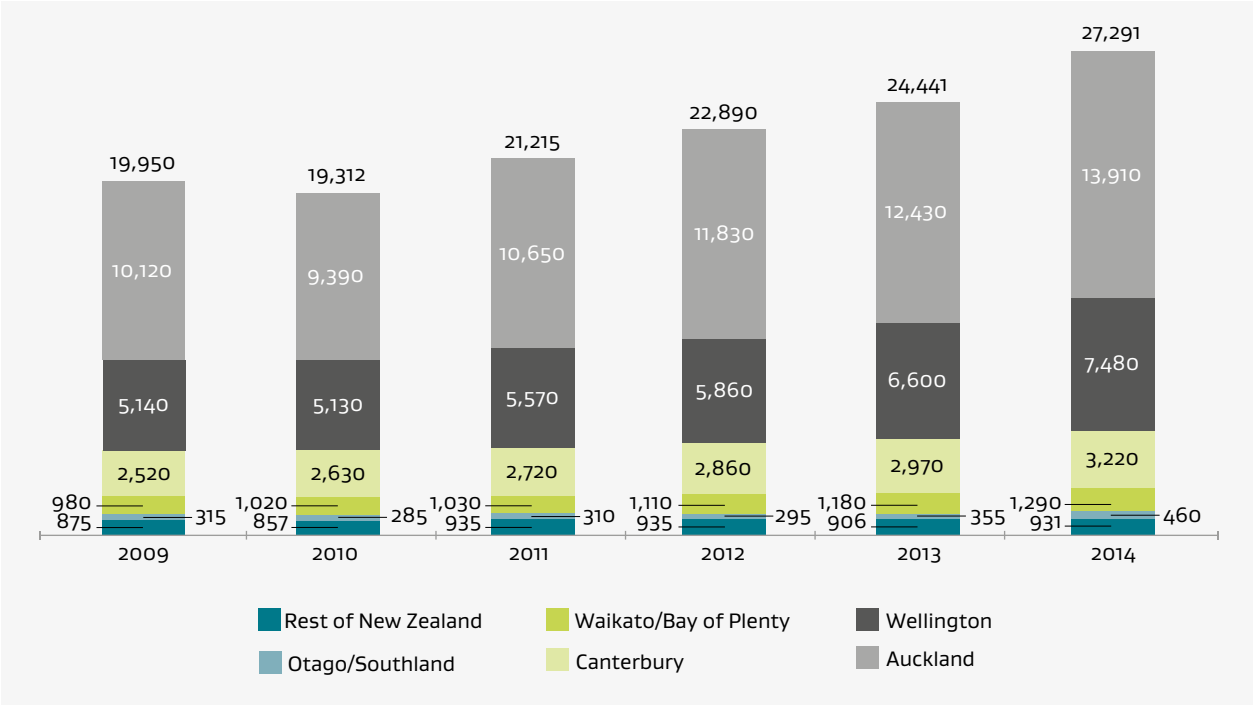


Note: totals may not match other pages due to rounding; Source: Statistics New Zealand Business Demographics database.

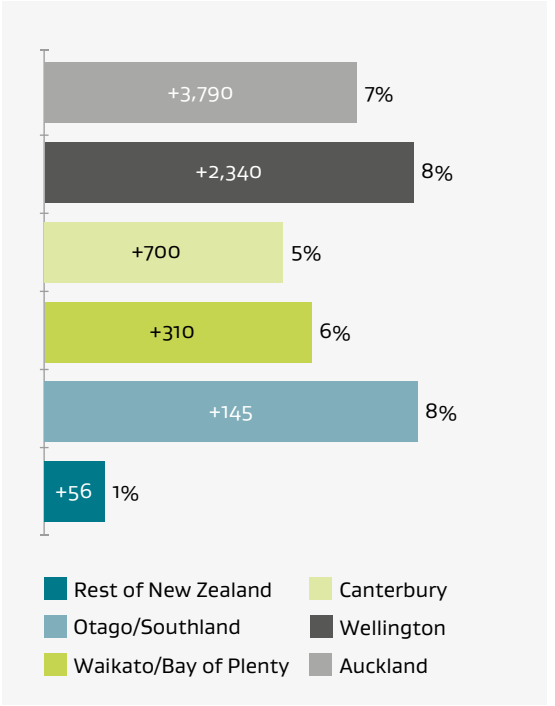
Employment by region

Computer system design jobs are concentrated in Auckland, Wellington and Christchurch; Auckland and Wellington are driving job growth in absolute numbers

Computer system design employment by region
Headcount; as of Feb; 2009–2014



5 year change in employment by region
% change; absolute change; 2009–2014



Source: Statistic NZ Business Demography.

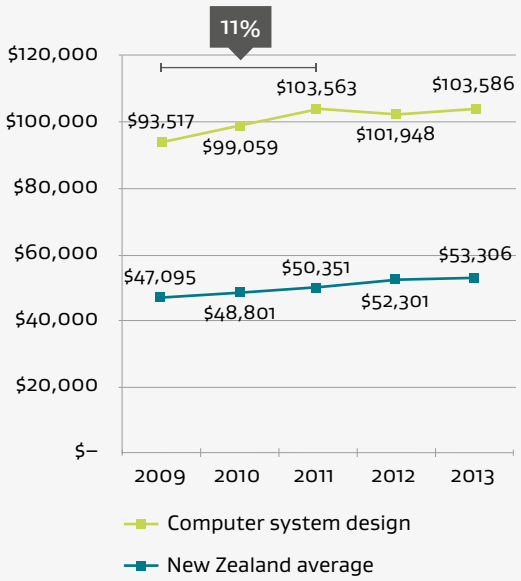
SECTION 4

Skills

Wages/salaries

Wages/salaries in computer system design are twice the New Zealand average; these grew by 11% in total in the two years to 2011, but growth has slowed more recently

Average salary/wages
NZ$; 2009–2013



	CAGR 2009–13	CAGR 2012–13	ABS 2009–14
Computer system design	2.6%	1.6%	+$10, 069
New Zealand average	3.1%	1.9%	+$6,212

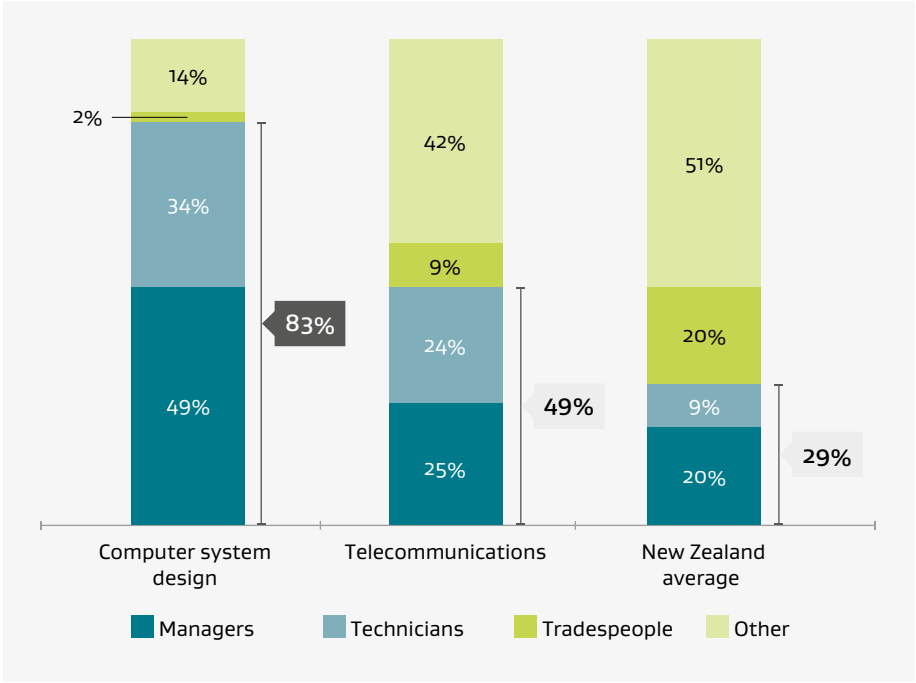
Note: average wage is calculated by total salaries & wages paid, divided by number of employees.

Source: Statistics New Zealand, Annual Enterprise Survey, 2013: MBIE analysis.

Composition of workforce by occupational group

Managers and technicians comprise 83% of the workforce

Workforce by occupational group*
% workforce; 2013



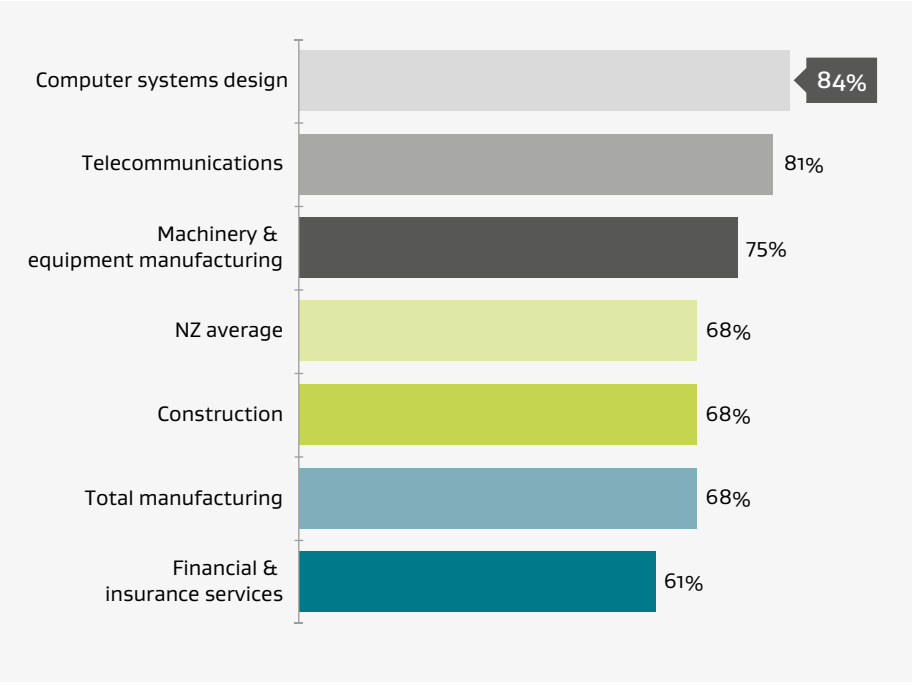
*Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2013).

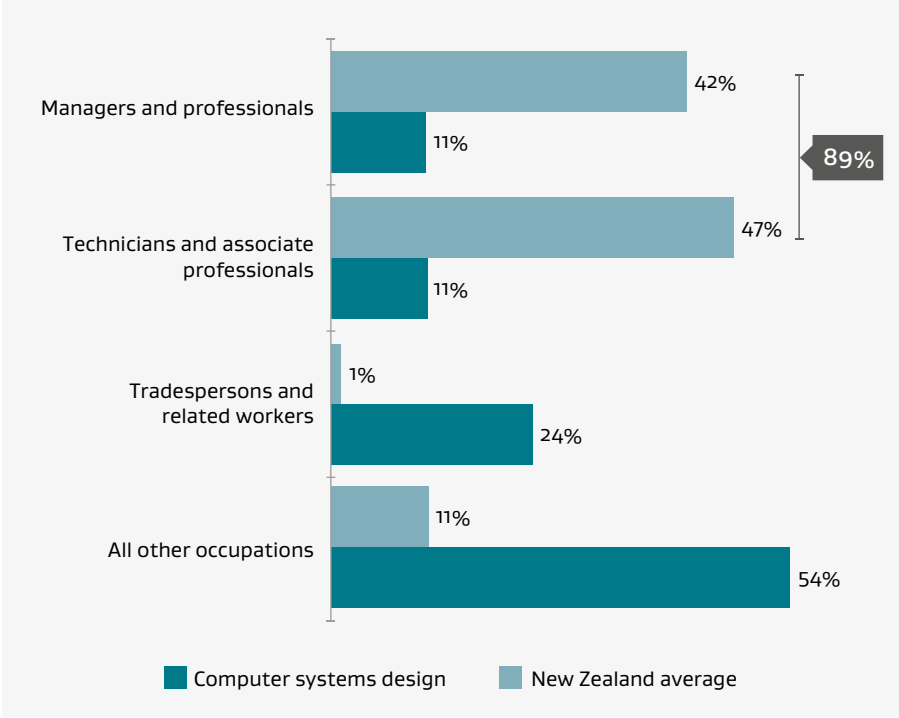
Vacancies

More computer system design firms reported vacancies than any other sector in the economy; 89% of the vacancies were for managers or professionals and technicians

Firms reporting a vacancy in the last year
% firms (selected sectors), 2013



Vacancies by role in the last year
% role, 2013



Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

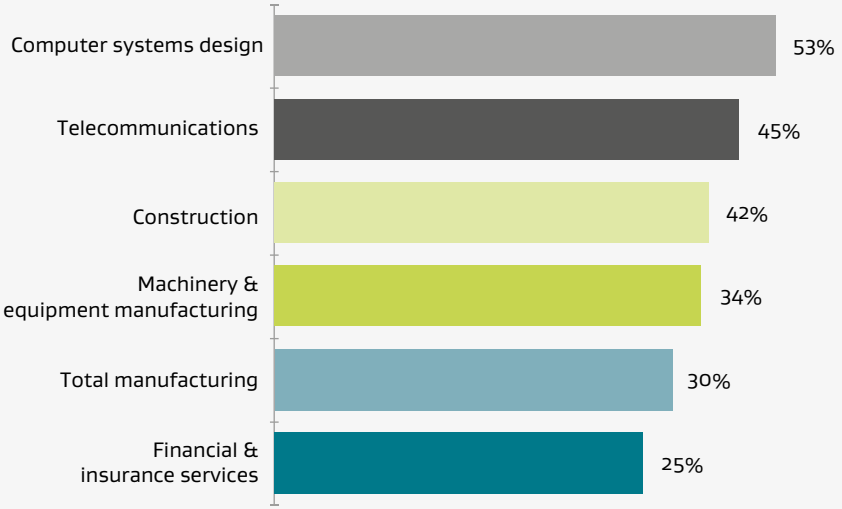
Source: Statistics New Zealand, Business Operations Survey (2013).

Hard to fill vacancies

More computer system design firms reported that vacancies were hard to fill than any other sector in the economy; lack of qualifications and work experience are key reasons

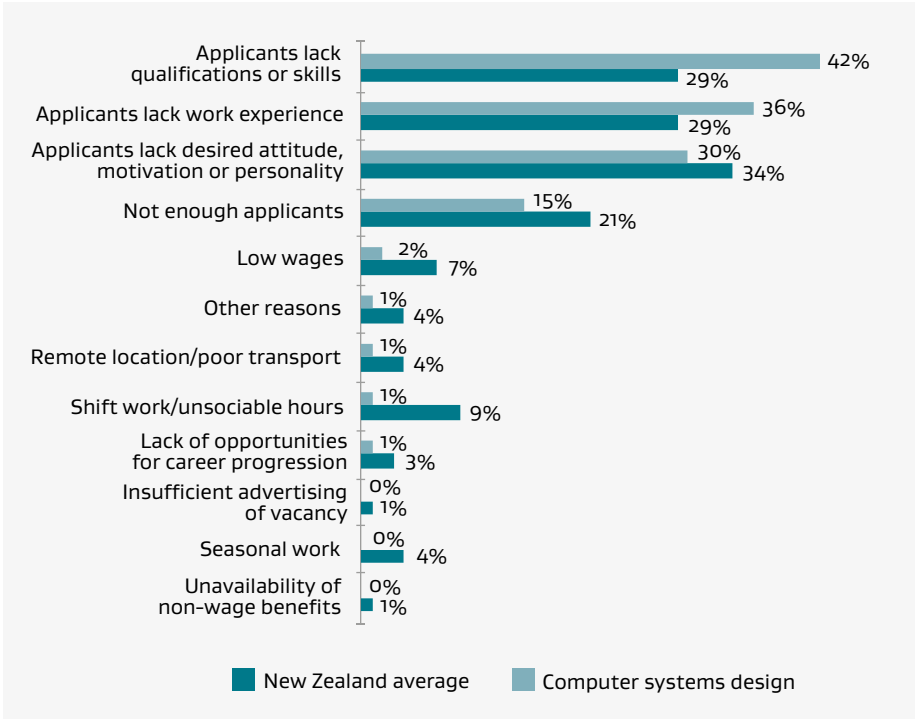
Hard to fill vacancies

% firms (selected sectors), 2013



Reason vacancies hard to fill

% reason, 2013



Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2013).

Industry comment

Firms use a range of strategies to fill skill shortages

What is the industry doing to fix this problem? Industry training and encouraging young people into technology careers. We are filling key roles, but we do often look offshore if the local market cannot supply. We have a number of initiatives to ensure we have the right resources in place, including recruitment from the local market, recruitment from the international market, internal recruitment programmes and graduate and internships to build talent.

We engage service providers who bring in their people who are skilled to fulfil a particular role or function. We do have a few contractors that come in and this is role based; it is usually on the basis they will hit the ground running.

IT Executive, large IT Product Firm

Our competition for people with tech skills is also coming from corporates that are digitising. Corporates are realising the many benefits to be gained from digitising their processes and/or becoming more Cloud centric, through to refining their manufacturing technology to become more productive.

We have a high number of New Zealanders supporting our offices abroad... If we have shortages we do leverage our offshore talent and offer training opportunities for staff, however it is also about taking a longer term view and doing our bit to promote IT as a career.

IT Executive, large IT Product Firm

SECTION 5

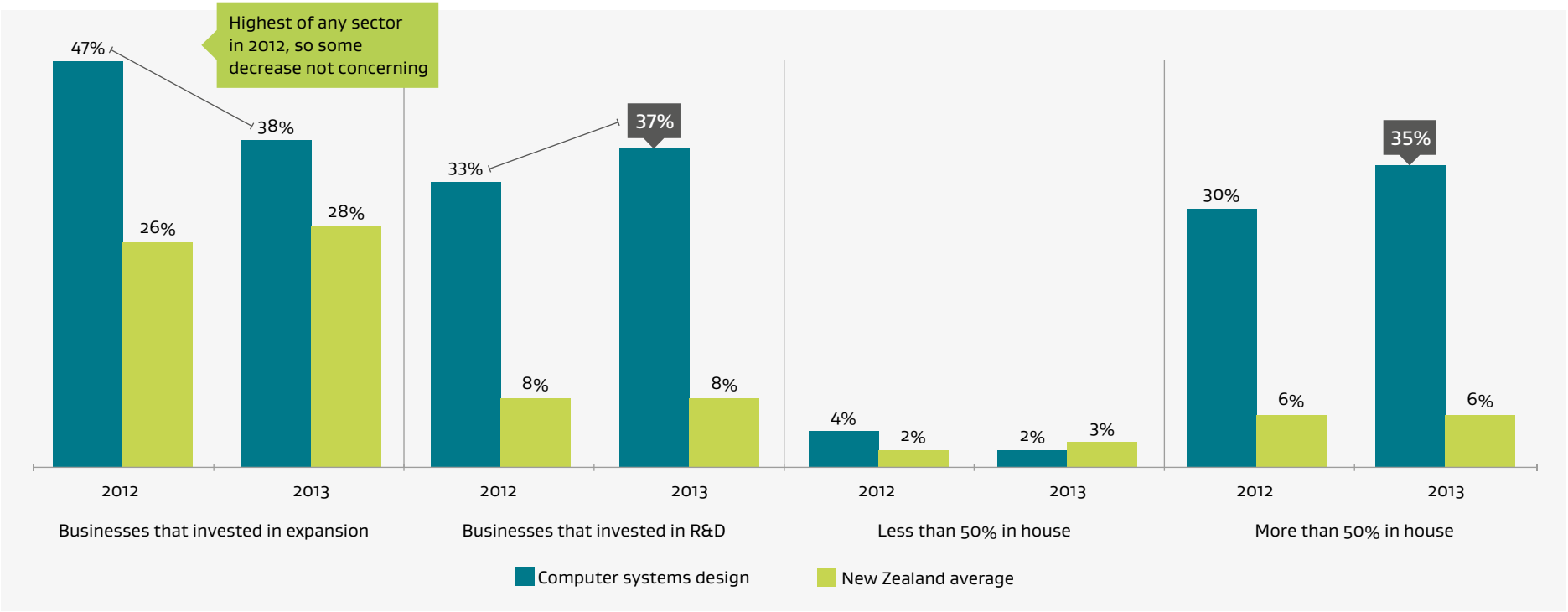
Investment in expansion, R&D and innovation

Investment in expansion and R&D

Thirty-eight per cent of computer system design firms invested in expansion in 2013; the percentage investing in R&D in 2013 increased marginally over 2012

Investment in expansion and R&D vs NZ average*

% firms; 2013 versus 2012



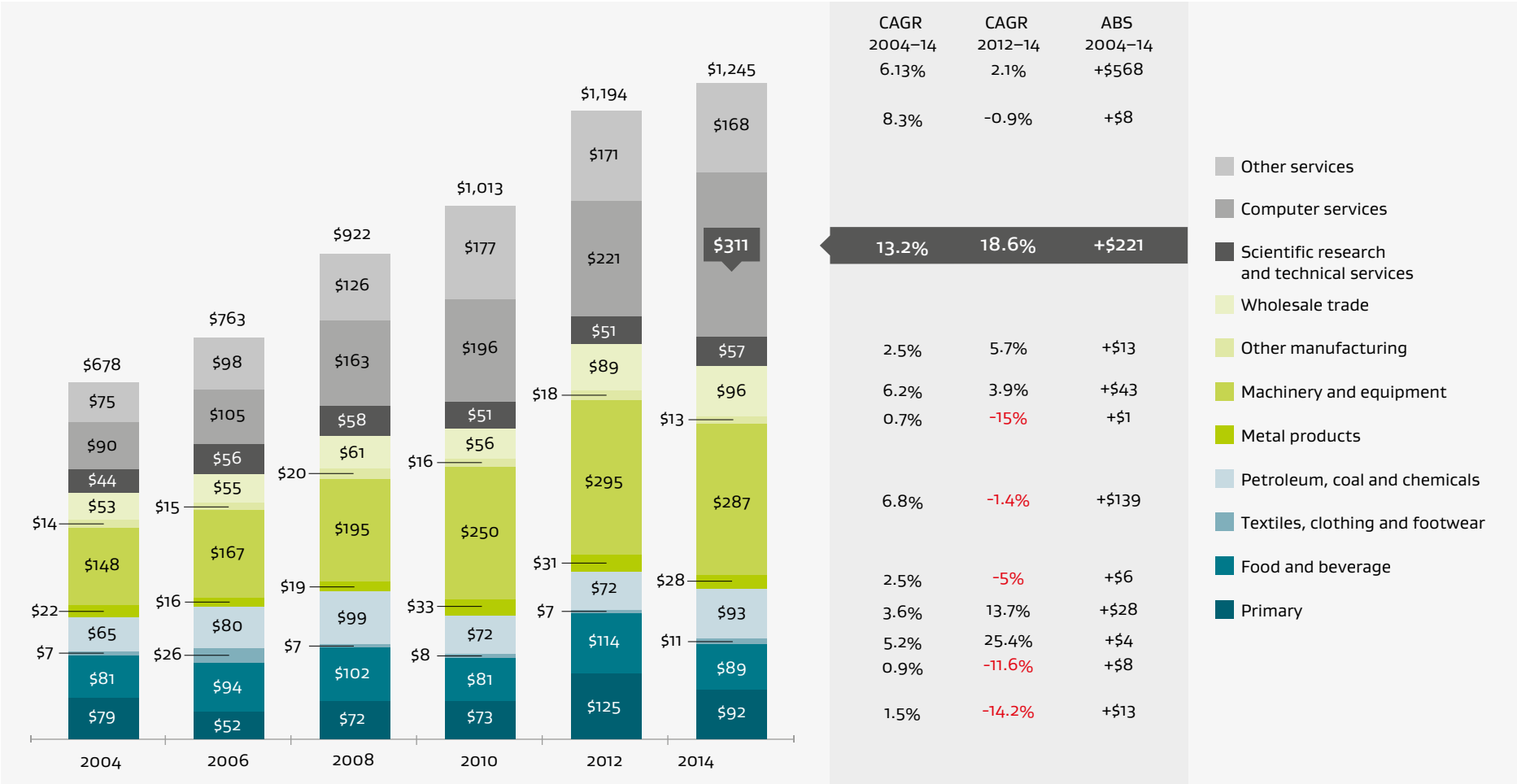
*Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2013).

Business expenditure on R&D (BERD)

Computer services businesses' investment in R&D grew at 13.2% CAGR in the period 2004–2014

Business expenditure on R&D (BERD) by sector
NZ$ millions; 2004–2014



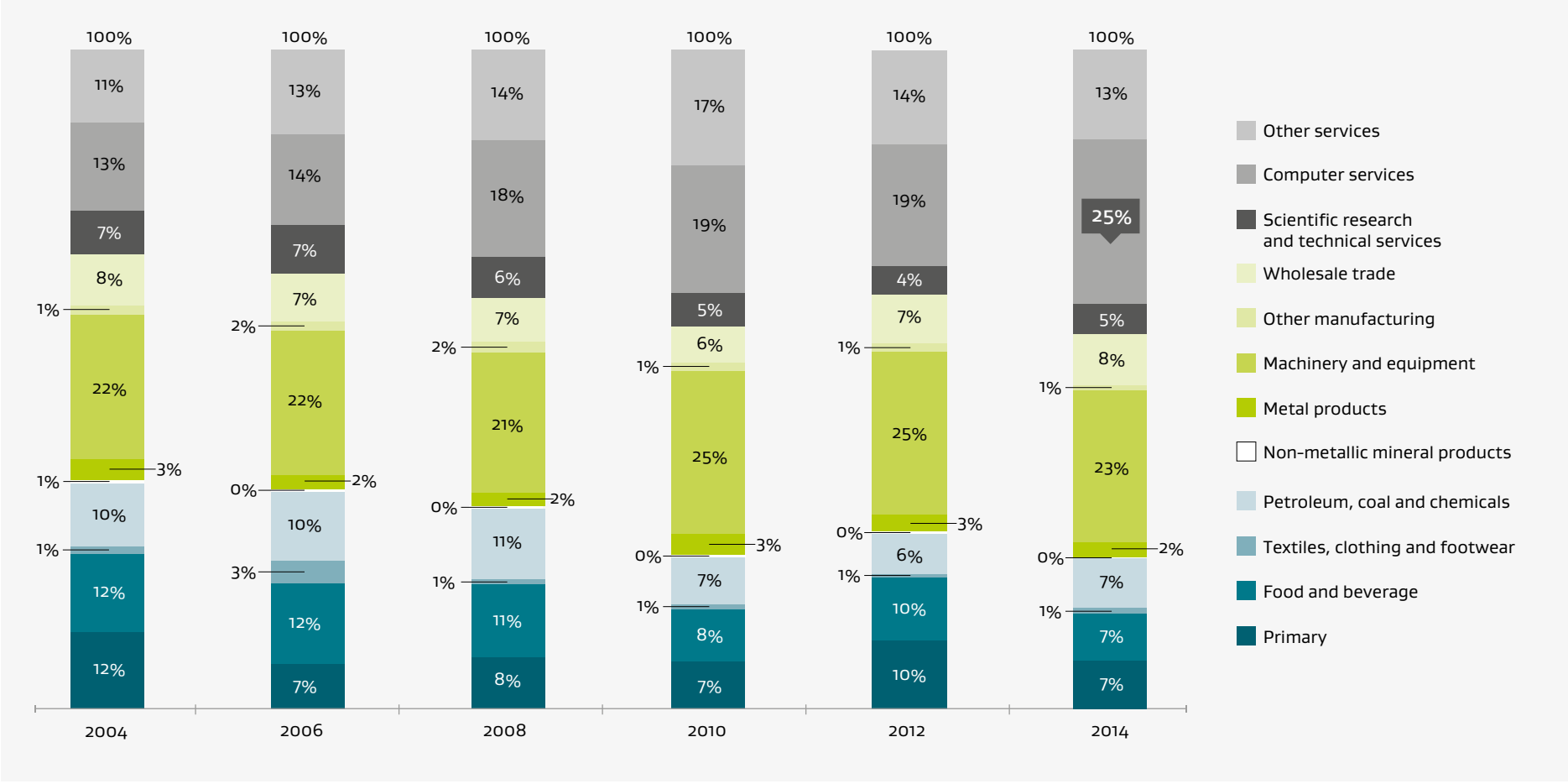
Source: Statistics New Zealand; R&D survey.

Business expenditure on R&D (BERD)

Computer services businesses now account for 25% of New Zealand's total business expenditure on R&D

Business expenditure on R&D (BERD) by sector

% sector, 2004–2014



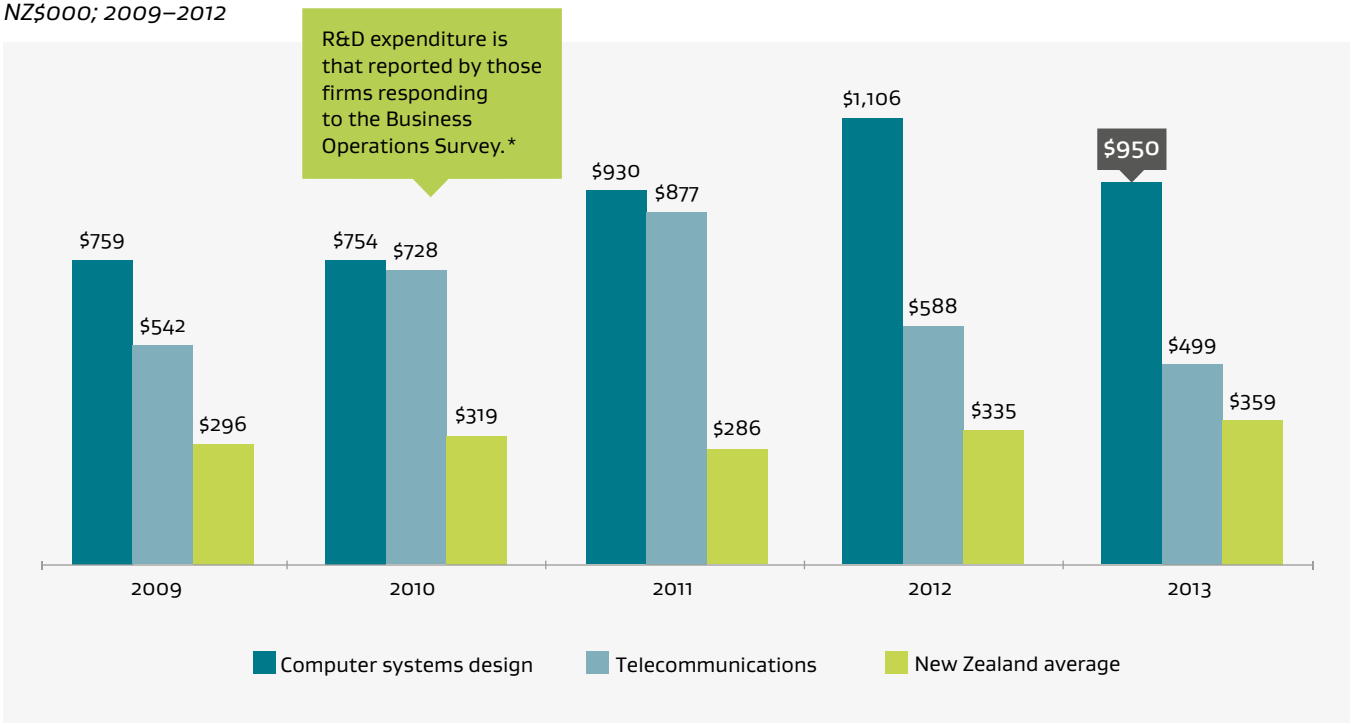
Source: Statistics New Zealand; R&D survey.

Average R&D expenditure per firm undertaking R&D

The average spend for computer system design firms undertaking R&D was $950,000 in 2013, marginally down on 2012

Average R&D expenditure*

NZ$000; 2009–2012



*Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

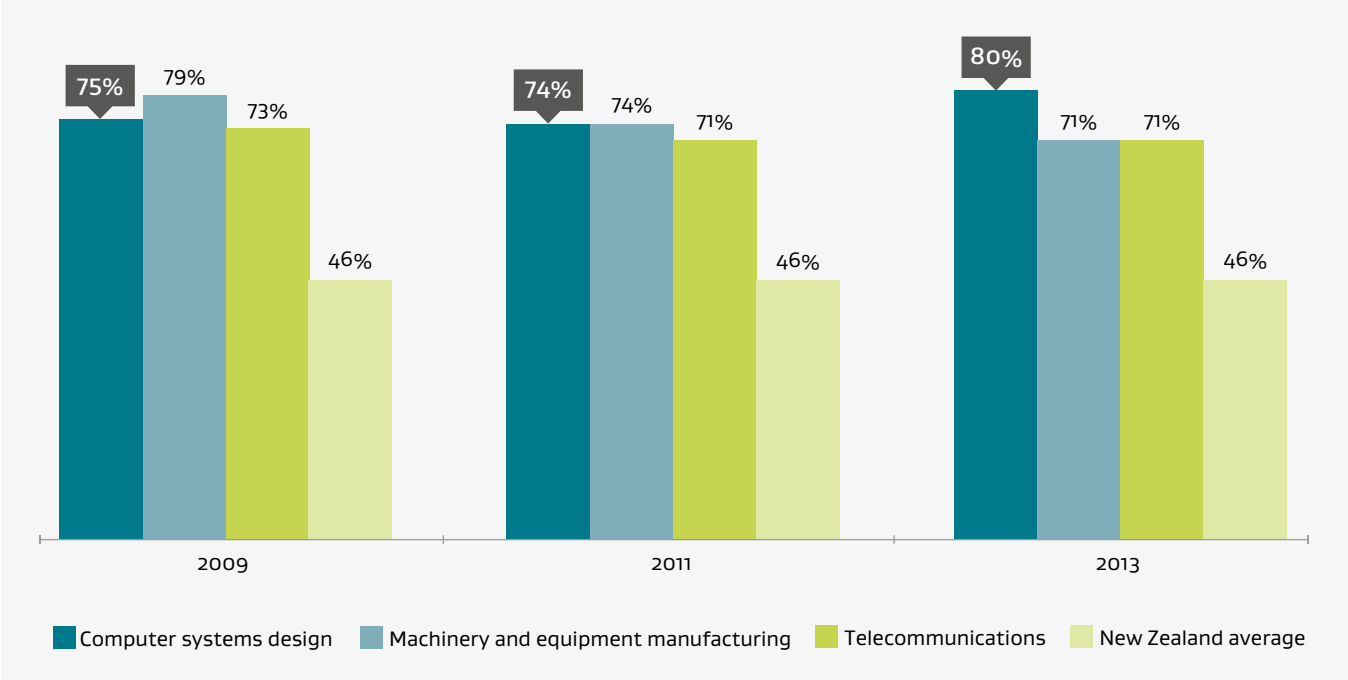
Source: Statistics New Zealand, Business Operations Survey (2013).

Innovation rate

Computer system design is consistently one of the top three innovating sectors in the economy

Firms reporting innovation

% firms; 2009, 2011 & 2013



Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2013).

Industry comment

Industry commented on New Zealand's cultural advantages in driving innovation and opportunities in our primary industries

> New Zealand has some great advantages as a location for software companies and R&D. For instance our egalitarian culture that challenges the norm without the perceived social consequences that are clearly apparent in most other countries including the US. This helps people think and act more freely and creatively, which is good for innovation. But understanding the actual size of the global opportunity from New Zealand is a huge hurdle.

Serial entrepreneur

> Also I believe we have some of the most progressive primary industries ripe for optimisation through the application of ICT, but our rural internet bandwidth and lack of focus on ICT as an optimising tool for other industries is getting in the way. ICT export for these types of solutions must be a significant opportunity but is under recognised I suspect.

Serial entrepreneur

SECTION 6

Exports and internationalisation

Internationalised IT firms: sources of value to the New Zealand economy

Exporting creates a range of benefits to the New Zealand economy; similar benefits can equally come from other forms of internationalisation such as off-shore investment

Benefit	Detail	Comment
Increased employment	Employment grew by 7% CAGR in the five years from 2009–2014, adding a total of 7,330 jobs. Wages and salaries are twice the New Zealand average.	Cloud accounting company Xero is likely to take on at least another 500 staff over the coming 12 months, chief executive Rod Drury says. NZ Herald, 13 Oct, 2014. Orion Health hired over 300 people in 2014 Orion Health Prospectus.
Wealth creation	Capital gains and dividends for shareholders, e.g. KiwiSaver funds.	Total market capitalisation of IT firms on the NZX as at April 2015: $7 billion.
Deeper connections with global markets: outward direct investment	Establishing sales, marketing and development centres offshore provides exposure to international competition, capabilities, ideas and technology, which flow back to and enhance the productive capability of the New Zealand economy.	Orion Health has 27 offices in 15 countries. “As at 30 September 2014, we have 405 Research and Development personnel, most of whom are located in five centres: Auckland: 244, Christchurch: 46, Bangkok: 59, Canberra: 18, Scottsdale, Arizona: 16.” Orion Health prospectus.
Deeper connections with global markets: foreign direct investment	Foreign firms investing in or acquiring New Zealand firms provide access to global expertise, distribution networks and capital for growth, and frees up New Zealand shareholders’ capital for re-investment.	Bringing in international investment frees up money for local investment by people like Rod Drury [who sold his first two start-ups, Glazer Systems and AfterMail – the latter to a North American buyer] who have gone on to the next big thing. So it’s that continual cycle of innovation and reinvestment. GreenButton founder and CEO Scott Houston, commenting on the sale of GreenButton to Microsoft. National Business Review, May 2014.

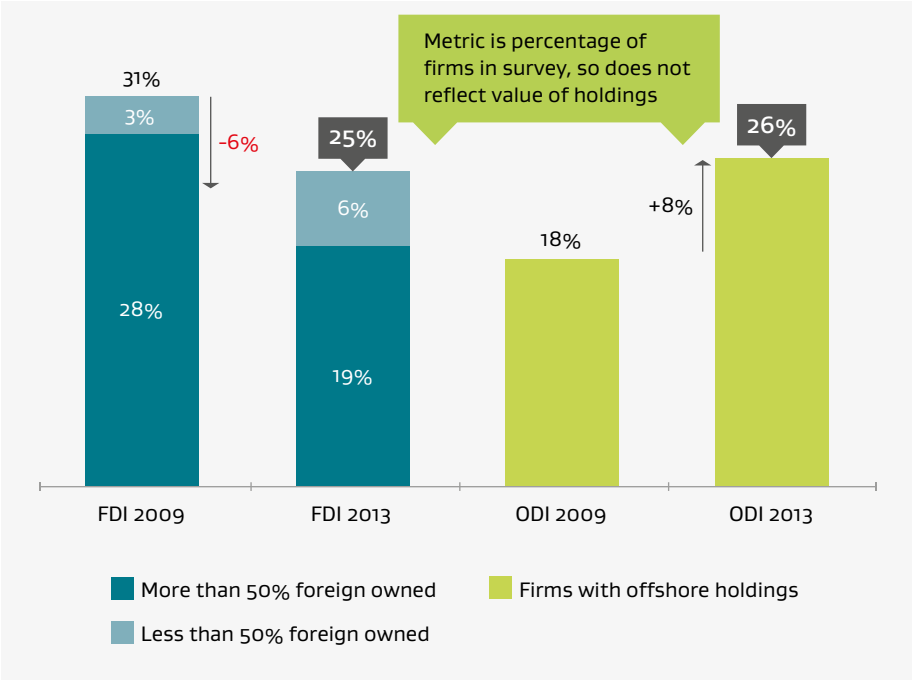
Internationalised IT firms: sources of value to the New Zealand economy *continued*

Benefit	Detail	Comment
Higher exports	Exports may include apps sold through the iTunes app store, contracts to supply and implement a system, licences to use software, subscriptions to software as a service applications, management fees paid by off-shore subsidiaries to the parent company (if domiciled in New Zealand) and R&D services provided to off-shore subsidiaries or owners.	Not all international revenues are exports. Trade in services includes transactions where no physical product changes hands, for example, a New Zealand lawyer providing advice to an overseas client. In the case of software as a service businesses, it is likely that the service will be provided by (for example) a US subsidiary and accessed from a US server by the US customer. In that case no data crosses the New Zealand border. Subscriptions may be paid direct to the New Zealand parent (e.g. by credit card) in which case the subscription payment is an export. In rarer cases subscriptions may be paid to the US subsidiary, in which case the subscription payment is not recorded as an export. Revenues earned will largely be used to fund the cost of sales, e.g. such as wages and salaries for sales and marketing staff in off-shore offices. If the business is in a growth phase and making a loss, then the parent will be funding the operating expenses of the subsidiary from cash reserves or debt.
Improved balance of payments	Profits from New Zealand owned off-shore subsidiaries improve the balance of payments.	Profits retained by an off-shore subsidiary (e.g. re-invested) will enhance the value of the parent's off-shore asset (i.e. increase the value of New Zealand's stock of outward direct investment). Repatriated profits will decrease the value of the off-shore investment but increase the value of the New Zealand parent. In either case the balance of payments shows improvement.

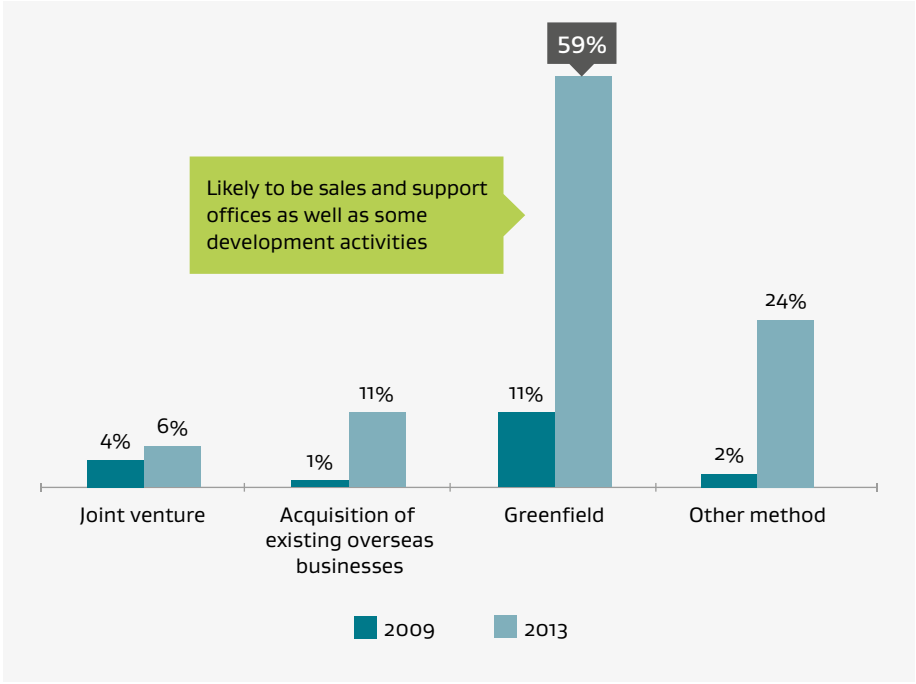
International connections

The sector is expanding internationally; encouragingly the percentage of firms with offshore holdings has crept ahead of the percentage with foreign ownership

Foreign direct investment in NZ firms; outward direct investment by NZ firms
% computer systems design firms; 2009 versus 2013



Method of gaining overseas ownership interests or shareholdings
% method, 2009 versus 2013

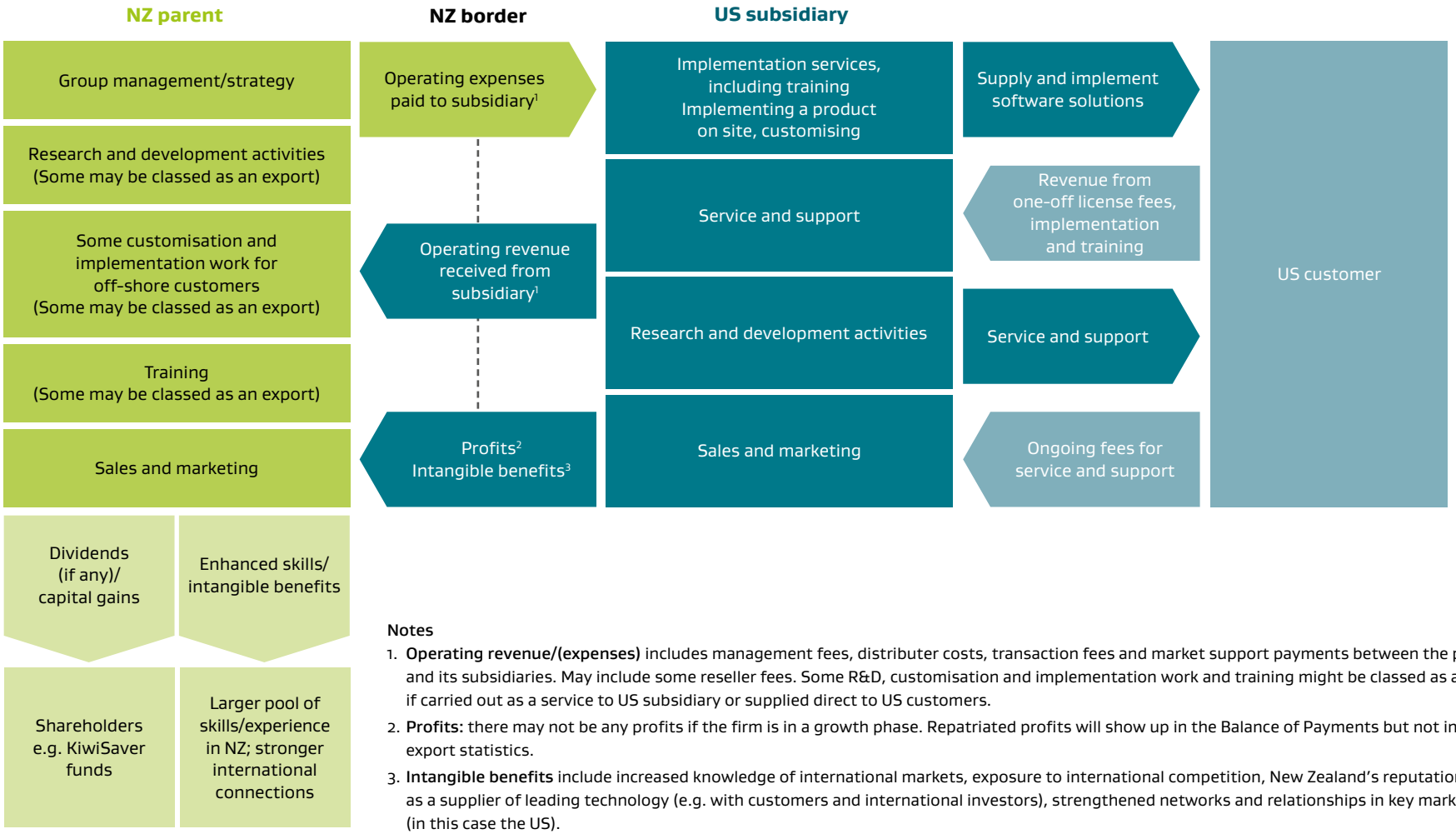


Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2013).

Simplified model of an internationalised 'software as a product' firm'

'Software as a product' firms contribute to services exports, depending on where the work is performed, but also create substantial value for the economy in other ways

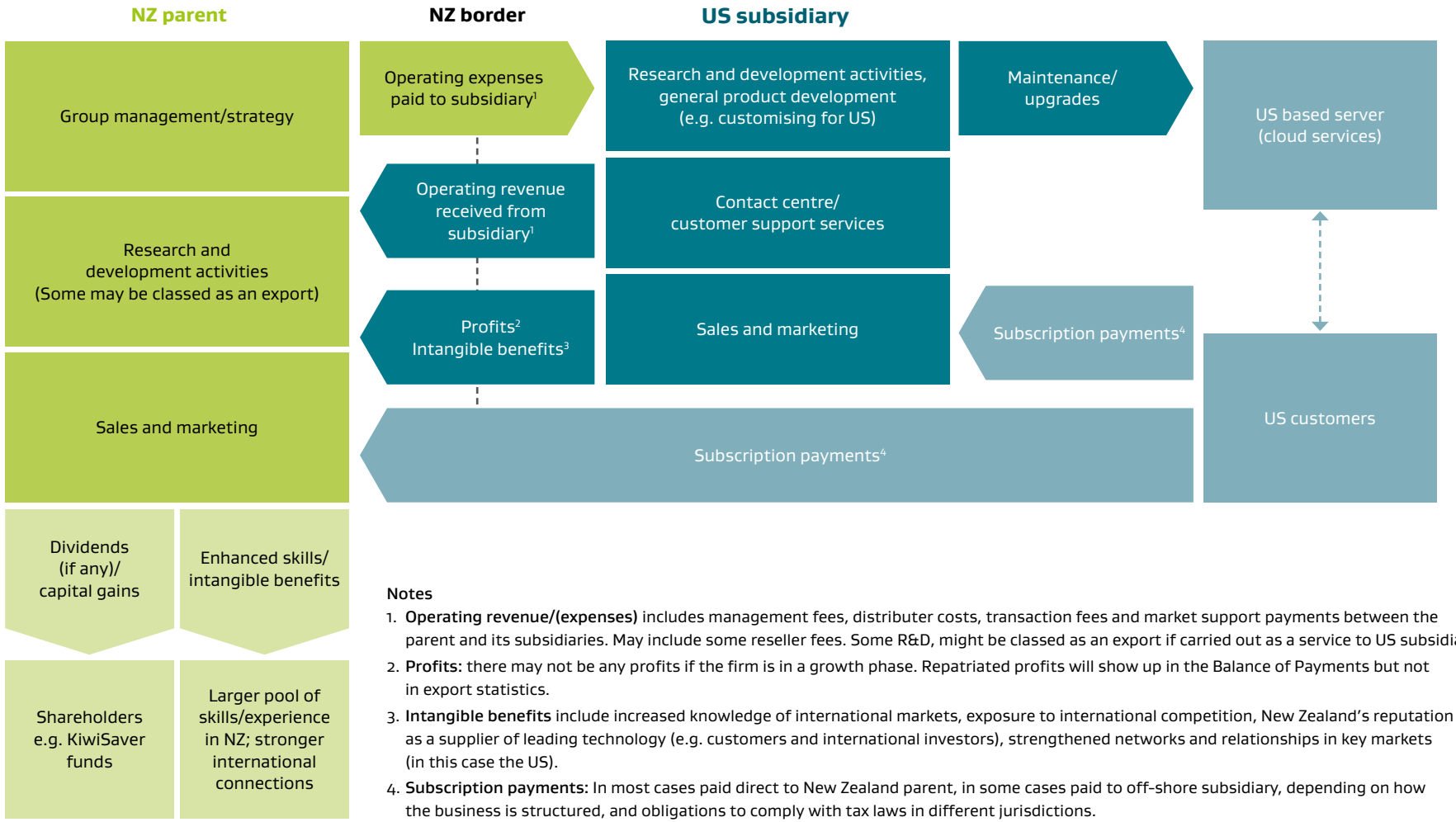


Notes

1. **Operating revenue/(expenses)** includes management fees, distributer costs, transaction fees and market support payments between the parent and its subsidiaries. May include some reseller fees. Some R&D, customisation and implementation work and training might be classed as an export if carried out as a service to US subsidiary or supplied direct to US customers.
2. **Profits:** there may not be any profits if the firm is in a growth phase. Repatriated profits will show up in the Balance of Payments but not in export statistics.
3. **Intangible benefits** include increased knowledge of international markets, exposure to international competition, New Zealand's reputation as a supplier of leading technology (e.g. with customers and international investors), strengthened networks and relationships in key markets (in this case the US).

Simplified model of an internationalised 'software as a service' firm

New Zealand owned 'software as a service' firms may not yet contribute significantly to services exports, but are creating substantial value for the economy in other ways



Notes

1. **Operating revenue/(expenses)** includes management fees, distributer costs, transaction fees and market support payments between the parent and its subsidiaries. May include some reseller fees. Some R&D, might be classed as an export if carried out as a service to US subsidiary.
2. **Profits:** there may not be any profits if the firm is in a growth phase. Repatriated profits will show up in the Balance of Payments but not in export statistics.
3. **Intangible benefits** include increased knowledge of international markets, exposure to international competition, New Zealand's reputation as a supplier of leading technology (e.g. customers and international investors), strengthened networks and relationships in key markets (in this case the US).
4. **Subscription payments:** In most cases paid direct to New Zealand parent, in some cases paid to off-shore subsidiary, depending on how the business is structured, and obligations to comply with tax laws in different jurisdictions.

Industry comment

Industry commented that complying with tax laws in different jurisdictions is the fundamental driver for how an internationalising firm is structured, summarised here

The way in which companies choose to structure their business operations is now not only driven by normal business considerations, but also by tax considerations. You want to ensure that the amount of tax you pay in each country accurately reflects the actual income you derive in that country, but you don't want to breach the capitalisation rules or transfer pricing rules in that process, otherwise you get a tax penalty in the local economy.

You don't have to be an economist to understand that the fundamental source of income is the activity that gives rise to that income.

Unfortunately, the origins of the international tax laws governing the "source" of income can be traced back to a time when each company only had its offices and all of its business activities, sales and shareholders in the same country. In those days, it was pretty easy to determine the source of the income derived by those companies. It was the same country in which their head office was located and where they paid their dividends to all of their shareholders, who also all lived in that country.

Nowadays, however, such outdated "source rules" provide a very inaccurate guide to the real economic source of the income derived by a company and its shareholders, since we now have a global economy where companies can have head offices in one country, and their subsidiary companies, operations and shareholders spread over multiple countries.

To date, much public attention has been placed on the opportunities that this provides large multinational companies to minimise the amount of tax they pay in each country through creative "tax planning" activities.

However, there has been relatively little attention given to the problems that even a small firm can experience ensuring that it pays an amount of tax in each country that accurately reflects the profits it earns from its activities in that country. For example, consider the case of a small New Zealand software company that produces all of its software in New Zealand, but sets up a subsidiary company in Australia that has a few employees to handle sales, customer service and training in that country. Since the sales office is registered as an Australian company it is subject to Australian tax rules and must pay Australian company tax on its profits in Australia.

Unfortunately, most of the income earned by that Australian subsidiary will be due to the activities conducted in New Zealand (i.e. the actual production of the software), rather than in Australia. If the New Zealand software company tries to reflect this in their tax accounts (e.g. by charging the Australian subsidiary fees to reflect the value of the range of services it is providing to its Australian subsidiary company, including the licence fees for the software it sells), it has to be careful it does not breach the international transfer pricing rules governing those transactions.

These international transfer rules are complex and most companies find they need the services of economists and accountants to ensure that they pay an amount of tax in each country that provides a reasonable estimate of the actual profit they earn from their activities in that particular country, as opposed to their activities in other countries.

Director, Sapere Research Group

Exports

IT services exports are divided into four categories plus 'other'

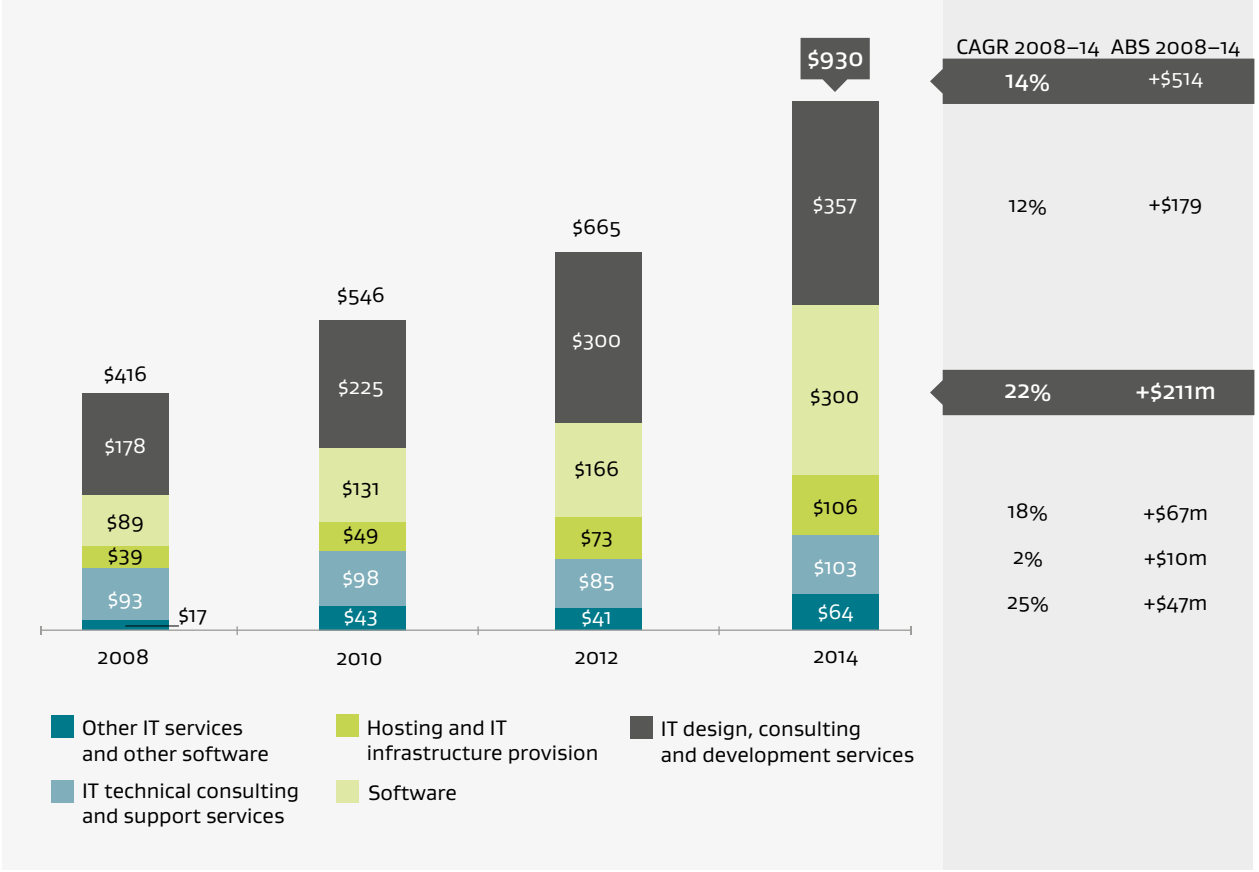
Category	Definition
Note: in the 2013 ICT Sector report, export data was sourced from Statistics New Zealand International trade in services tables. This report uses data from Statistics New Zealand ICT supply survey, which provides a much more accurate picture. See: www.stats.govt.nz/browse_for_stats/industry_sectors/information_technology_and_communications/ict-supply-survey-info-releases.aspx Exports by country on page 58 uses the International trade in Services by Country data set, which provides data up June 2013. Treat this as directional.	
IT design, consulting and development services	Design and development of IT solutions. Creating and/or implementing software applications, custom programming, customisation and integration of packaged software. Developing and implementing client-specific networks. Developing client-specific computer systems.
Software	Off-the-shelf (packaged) software developed for wide distribution and produced for multiple sale or licensing. Limited end-user licences as part of packaged software. Licensing services for the right to use computer software. PC and gaming console games. Note: strictly speaking packaged software is a good, rather than a service, being a physical product.
Hosting and IT infrastructure provisioning services	Website or email hosting with or without integration of applications (online storefronts, order processing, data warehousing). Supporting, hosting and managing business processes for a client (financial transaction/credit card processing, payroll processing, personnel administration, logistics services, help desks, call centre). Provision of leased software applications from a centralised, hosted and managed computing environment. Data storage and management services, co-location services. Video and audio streaming services, computer time share.
IT technical support services	IT hardware repair and maintenance, routine testing of hardware. Providing technical expertise to solve IT-related problems. Maintenance and troubleshooting of software or hardware. Provision of software patches and upgrades. Management and monitoring of a client's IT infrastructure (ie hardware, software, networks). Day-to-day management and operation of a client's computer system. Transforming information from one format or media to another. Data or disaster recovery services.
Other IT services and other software	Exports of IT services not covered by the above.

Source: Statistics NZ: ICT Supply Survey, 2014.

Export growth

Exports of IT services are growing strongly across all categories

IT services exports by category
NZ$ millions; 2008–2014



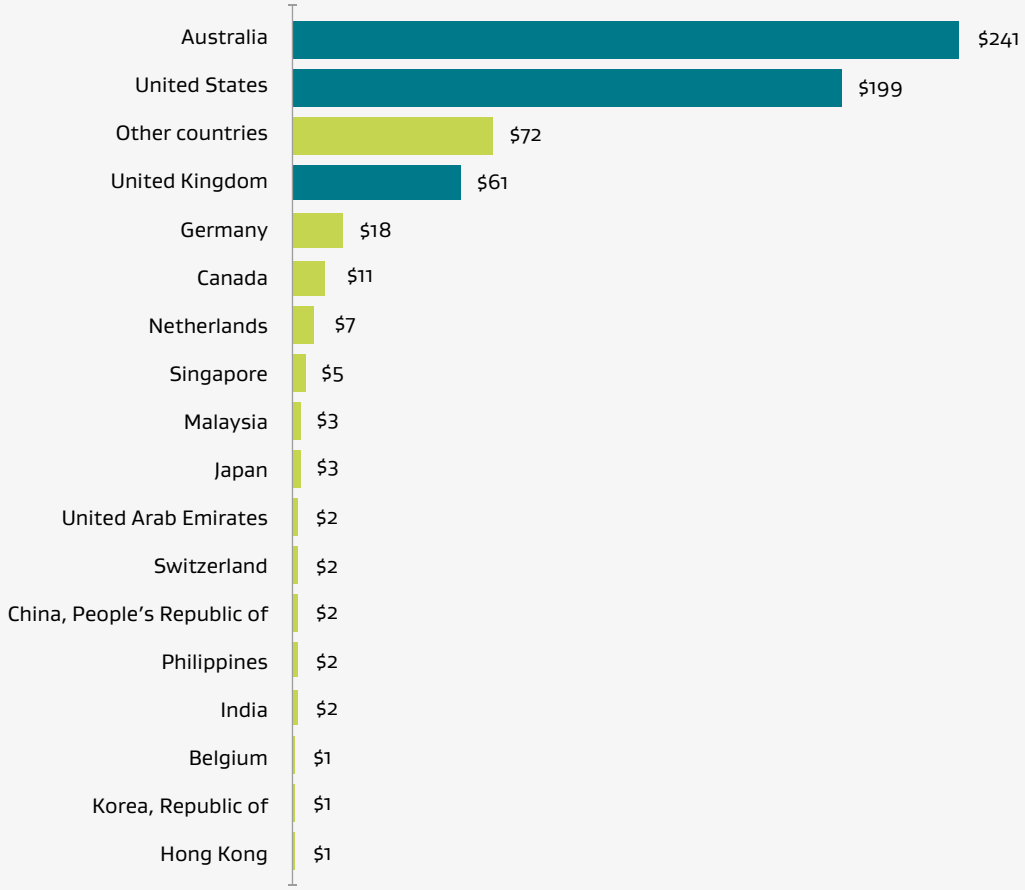
Source: Statistics NZ; ICT Supply Survey 2014.

Export dollars

Australia, the UK and the US account for 74% of all exports

IT services exports by market

NZ$; 2013 (latest available by country)



Note: treat as directional only

Total exports in 2013 = $681m.

This chart excludes $48m of exports for confidentiality reasons.

Data is an aggregate of computer and information services and royalties and license fees received for computer software.

Uses Trade in Services data.

Source: Statistics NZ, International trade in services by country: year ended June, 2006 to 2013 (latest available by country).

Industry comment

Industry commented that it will take time for software as a service firms to realise their full export potential, but the platform for growth is established

With enterprise software sales, payments are generally front loaded, with license fees paid up front. Software as a service [SaaS] on the other hand is pay as you go. It takes a long time for the volume of revenues in absolute numbers to build up to be material. The fact that export growth appears less that you might expect from SaaS companies is simply because it's early days. There are many New Zealand SaaS companies selling successfully around the globe. It is just too early for these revenues to move New Zealand's numbers. I would expect software exports to push through the billion dollar barrier soon, and to achieve compounding year on year growth for at least the next 10 years.

I met a company recently that was started as a hobby a couple of years ago and they've already got payments coming in from 40 countries around the world. The monthly revenue is still tiny, but this early customer traction proves that there is a demand for their product. So if they scale it up and get better sales and marketing, they should grow their revenues dramatically month on month for years to come. This is not an isolated example. There are scores of small SaaS companies bringing in export revenues with the potential to become meaningful businesses.

Another more traditional software company I represent is buying their overseas distributors and complementary businesses. Obviously they have to pay their overseas staff, but all of the license revenues come back to New Zealand, so that is all weightless export dollars. This is one of 15 to 20 New Zealand software companies that I am aware of that have the potential to become $100 million per annum revenue businesses in the next 2–5 years. Even if only five of these make it onto the NZX like Orion Healthcare last year, suddenly the importance of this sector will be much more visible.

The final thing to remember is while the export revenues of New Zealand software/SaaS/ecommerce businesses may currently be relatively small, the value of those companies is a significant multiple of those revenues. So while it will take some years to develop enough companies of scale for annual export revenues to make a major impact on New Zealand's balance of payments, when these companies get purchased by overseas buyers they will move the balance of payments dial (as the sale of Trade Me did in 2006). We are going to see $100 million plus sales of New Zealand tech companies with increasing regularity in the coming years, now that the effects of the GFC seem to have washed through merger and acquisition markets, and as New Zealand tech companies grow and mature.

Partner, technology law firm

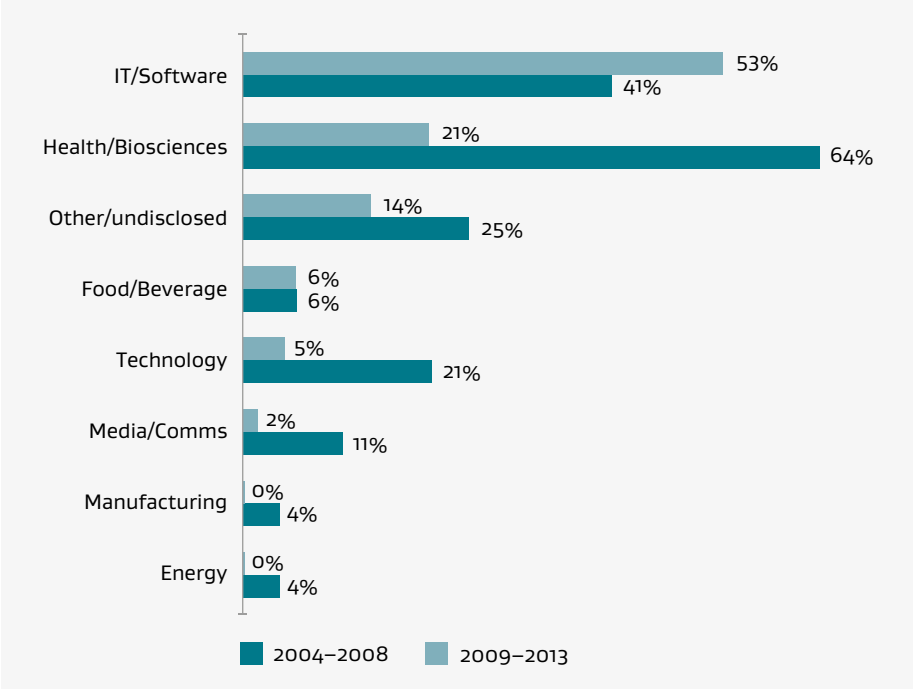
SECTION 7

Investment and financial performance

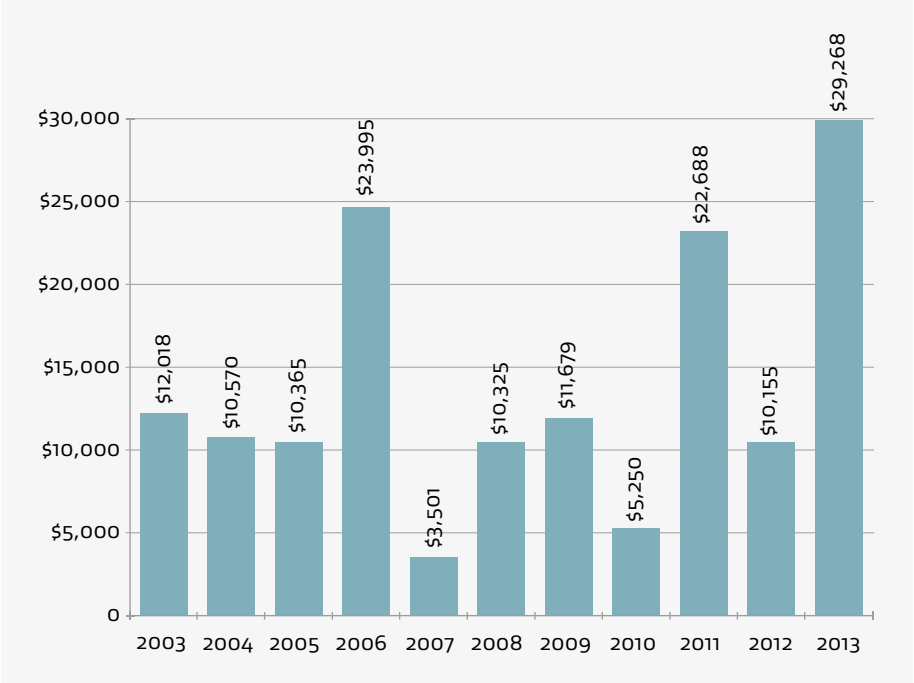
Venture and early stage investment

Venture and early stage investment is trending towards IT/software; a record $29 million was invested in 2013

Venture and early stage investment by category, last five years
% value, 2009–2013



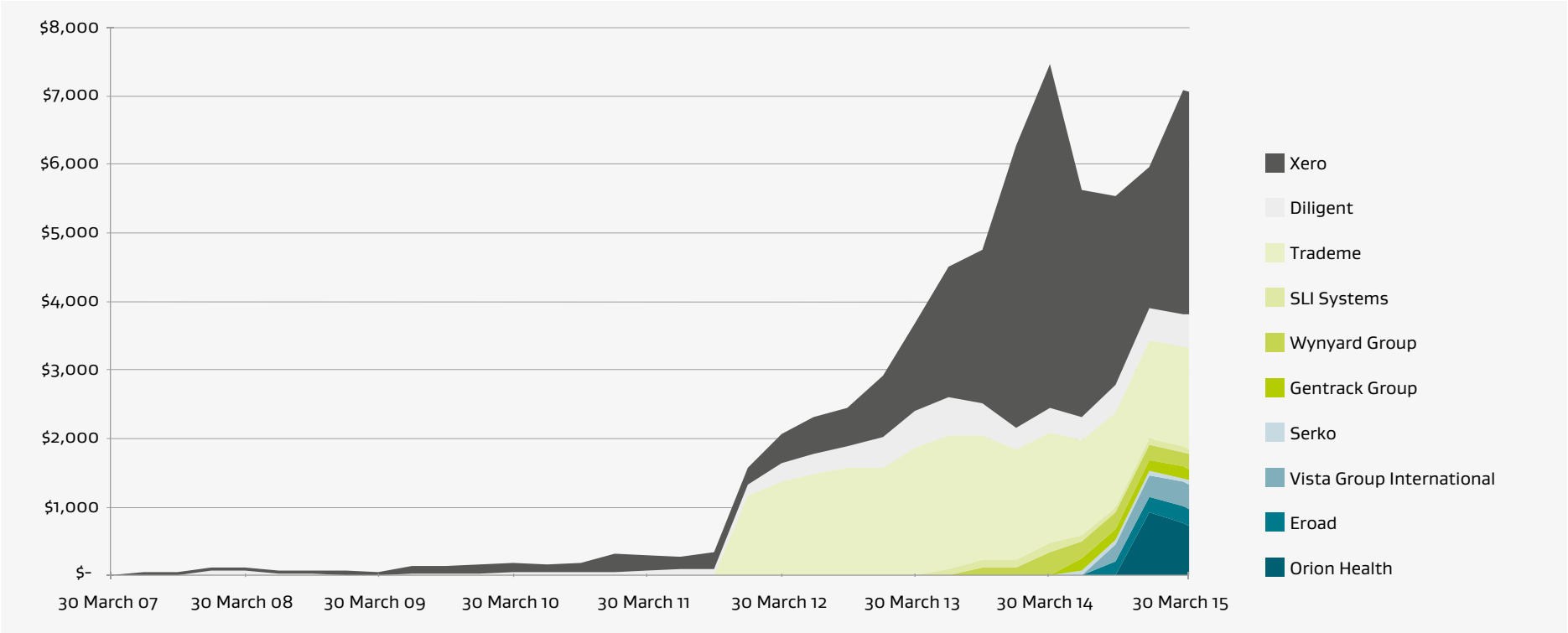
Venture and early stage investment in IT and software firms
NZ$000; 2003–2013



IT stocks market capitalisation

The value of listed IT stocks on the NZX has grown at 101% CAGR in the period 2007– 2015; total market capitalisation as at April 2015 was $7 billion

IT firms market capitalisation with constituents
NZ$m; March 2007–April 2015



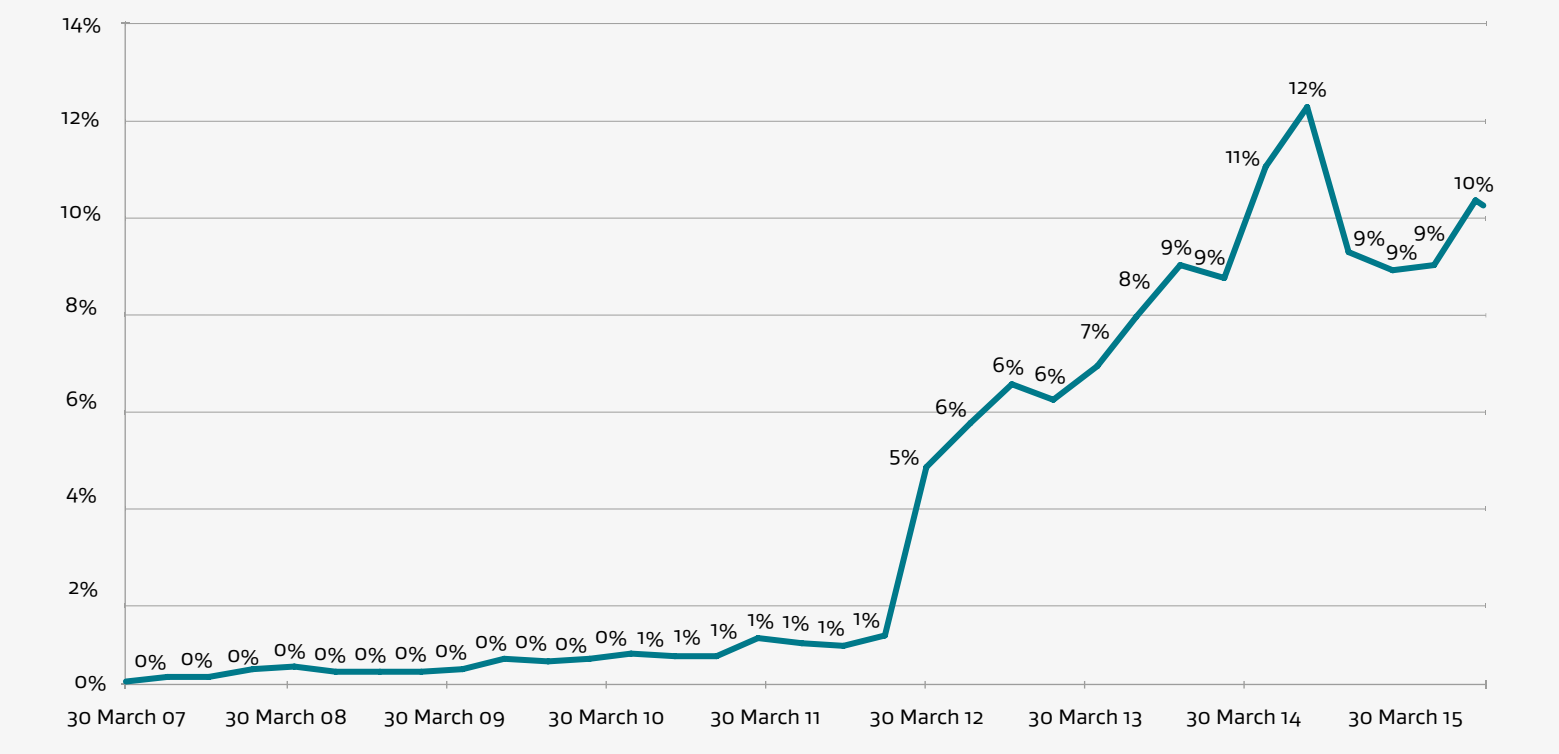
Source: chart and data supplied by the NZX.

IT stocks as a percentage of total NZX market capitalisation

IT stocks now make up 10% of the value of the NZX

IT Market Capitalisation as a percentage of NZX ALL

% value

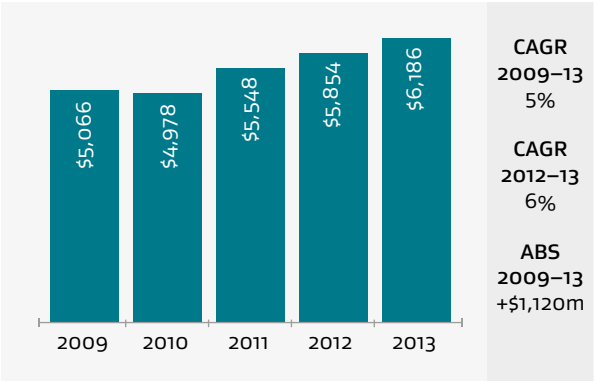


Source: chart and data supplied by the NZX.

Revenue

The combined revenue of the computer system design sector is growing at 5% per annum; in absolute terms revenues grew by $1.12 billion in the period 2009 to 2013

Total revenues
NZ$m; nominal; 2009–2013

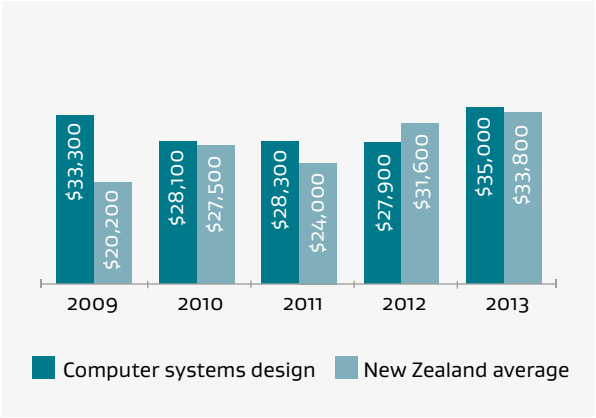


Source: Statistics NZ, Annual Enterprise Survey.

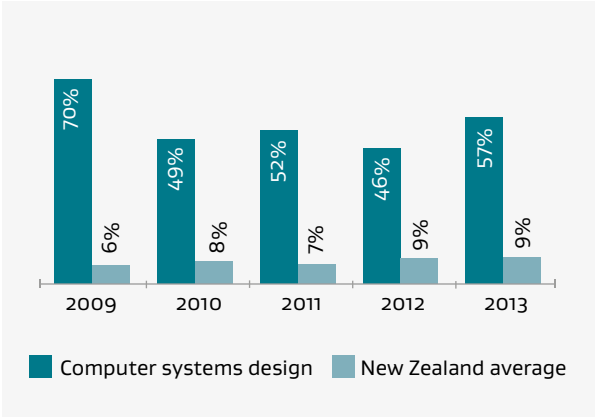
Financial performance

Firms in computer system design generate a good margin and a high return on equity

Surplus per employee
NZ$; 2009–2013



Return on equity
%; 2009–2013

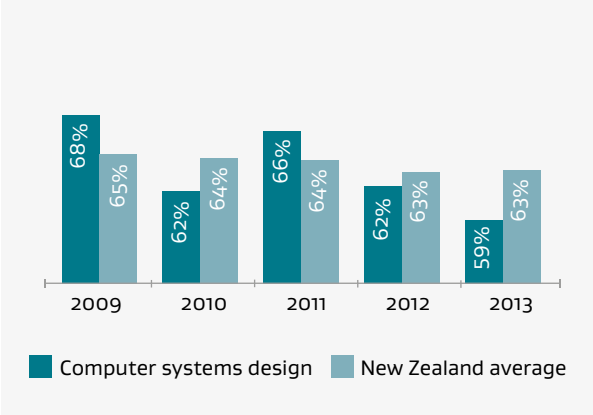


Source: Statistics New Zealand, Annual Enterprise Survey (2012 & 2013)

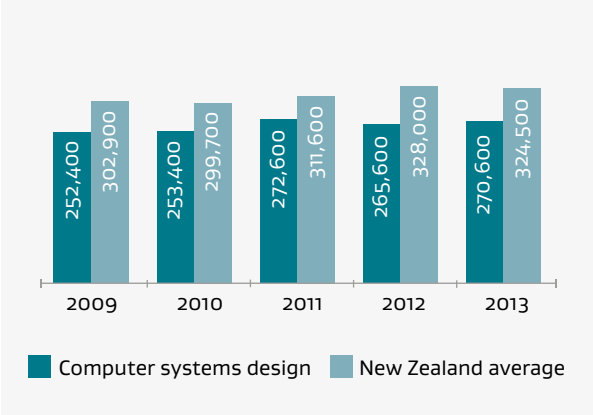
Financial performance

Income per employee is below the New Zealand average, but showing marginal improvement

Debt ratio (total liabilities divided by total assets)
%; 2009–2013



Total income per employee
NZ$; 2009–2013



Source: Statistics New Zealand, Annual Enterprise Survey (2012 & 2013).

CASE STUDY

Interactive gaming industry

New Zealand's interactive gaming industry

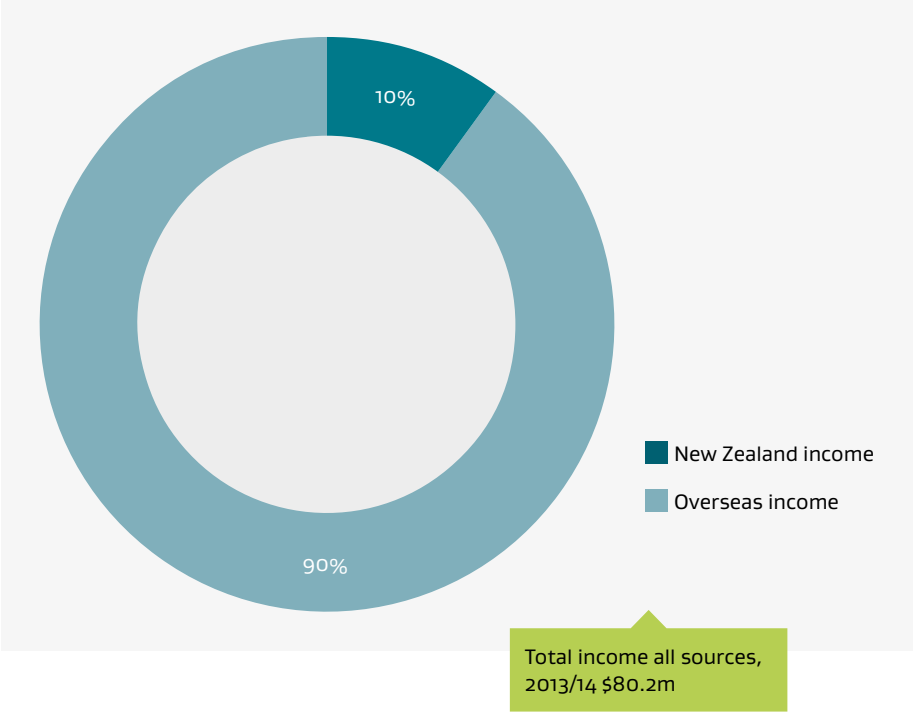
The New Zealand interactive gaming industry has rapidly grown from small beginnings to be a multi-million dollar export industry

Summary

- "The worldwide video game marketplace, which includes video game console hardware and software, online, mobile and PC games, will reach $93 billion in 2013, up from $79 billion in 2012, according to Gartner, Inc. Driven by strong mobile gaming and video game console and software sales, the market is forecast to reach $111 billion by 2015."

  Source: www.gartner.com/newsroom/id/2614915
- The smartphone mobile gaming segment grew at 36% per annum in the period 2011–14.
- New Zealand game studios have specialised in this segment and sales grew at 143% per annum in the last two years.
- The rapid adoption of smartphones and tablets globally and the ability to reach global markets via app stores means that effectively there are no barriers to entry for New Zealand game developers.
- Total overseas income topped NZ$72 million in the 2013/14 year up from just $16 million in 2011/12.
- Other positive indicators include:
  - Foreign direct investment, e.g. the largest studio in New Zealand is the French owned Gameloft with 150 employees.
  - Outward direct investment, e,g. Ninja Kiwi's acquisition in 2012 of Scottish studio Digital Goldfish.
  - Investment in New Zealand firms totalling $2.8 million in the last three years.
  - 450 fulltime employees made up of programmers, artists, managers, administrators and marketers, with an additional hundred or so part-time developers.
- The New Zealand Game Developers Association has 33 members, www.nzgda.com.

New Zealand game development studio's income, 2013/14
% market

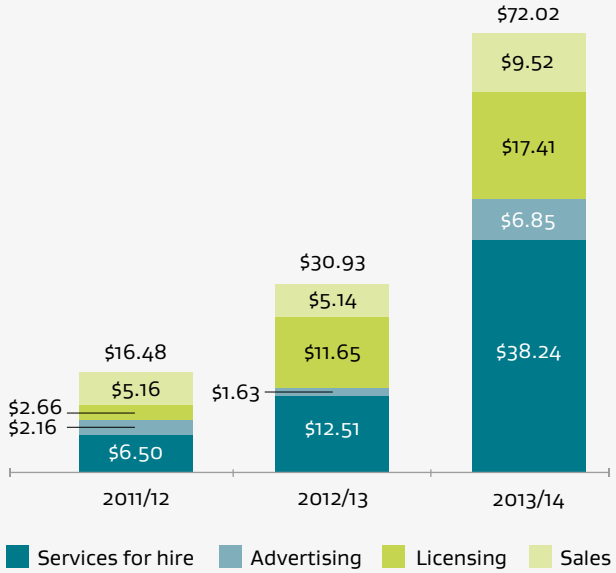


This case study is based on data sourced from the 2014 New Zealand Game Developers Association' member survey. Used with permission.

Exports

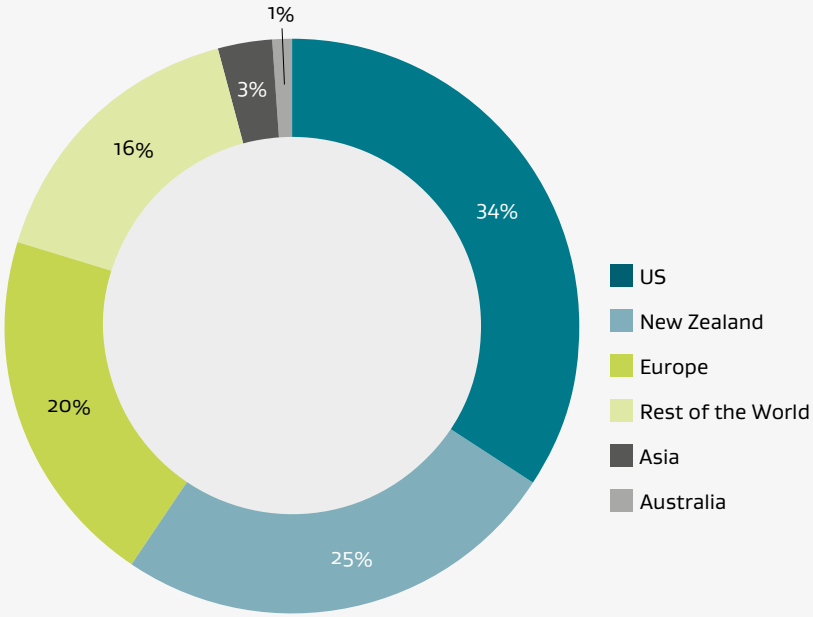
Overseas income surged in 2013/14 driven by 'sales' (smartphone and tablet games) and advertising embedded in games

Overseas income by category
NZ$; 2011/12–2013/14



	CAGR 2011/12	ABS 2013/14
	109%	+55.53m
	36%	+$4.36m
	156%	+$14.74m
	36%	+$4.3m
	143%	+$55.53m

Percentage of respondents' sales by market
% market; 2013/14



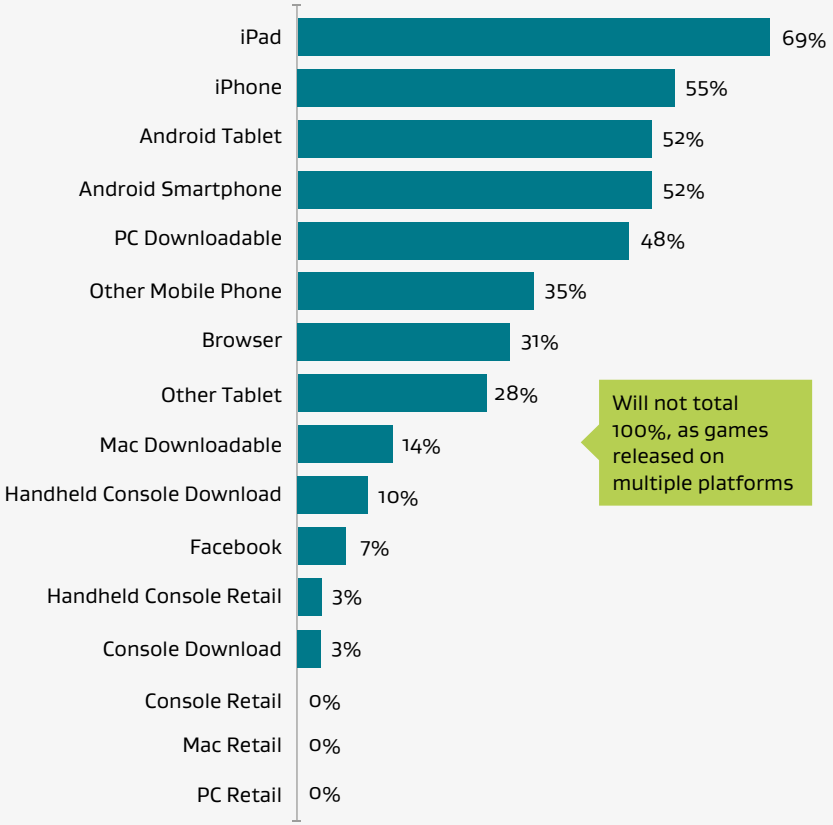
Note: treat as directional
Percentage of sales as reported by each respondent in each market so will not correlate with value, e.g. by value the New Zealand market is 10%.

This case study is based on data sourced from the 2014 New Zealand Game Developers Association' member survey. Used with permission.

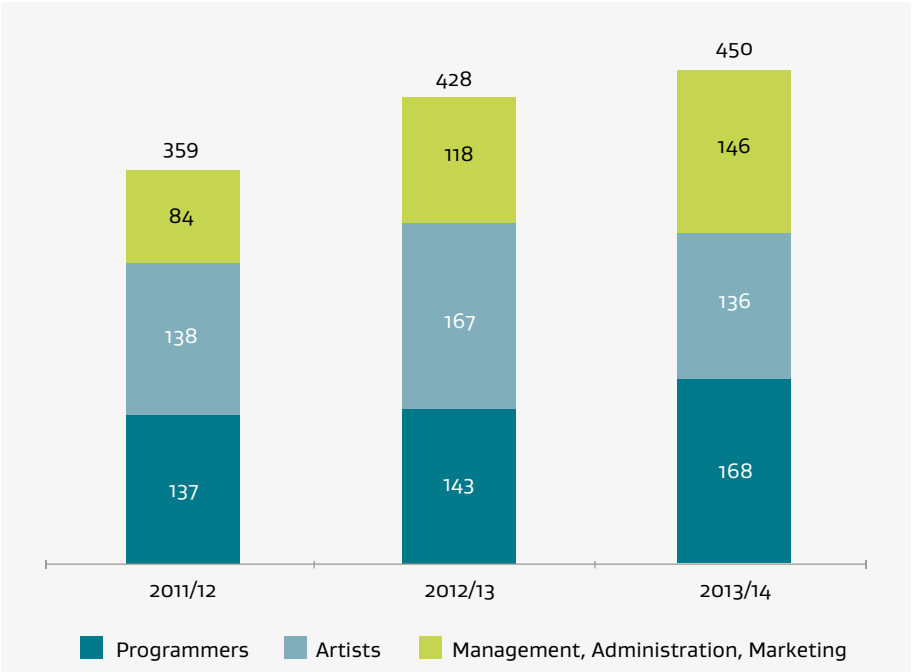
Platform and employment

The majority of games are released on smartphone and tablet platforms; employment spans artists, programmers, managers and marketers

Platforms respondents designed for
% releases, 2013/14



Employment by occupational type
 # employees; 2011/12–2013/14



Note:
Some respondents only gave total figures. Thus the total amounts are greater than the sum of programmers, artists and management.

This case study is based on data sourced from the 2014 New Zealand Game Developers Association' member survey. Used with permission.

SECTION 8

Digitisation of the economy

Digitisation of the economy

As is occurring globally, many social and economic activities in New Zealand are going digital

Moore's Law...

Moore's Law (as predicted by Gordon Moore, Intel's co-founder, in 1965), says that the number of components that can be put on a chip at the same price can be expected to double every two years. Since the first commercialized 8-bit microprocessor was introduced in 1974 there has been time for 20 doublings, generating a growth factor of 1,048,576.[1]

...the chip on your iPhone that's the size of your thumb holds 2 billion transistors. And that isn't the most powerful chip – there are chips with 8 billion transistors.[2]

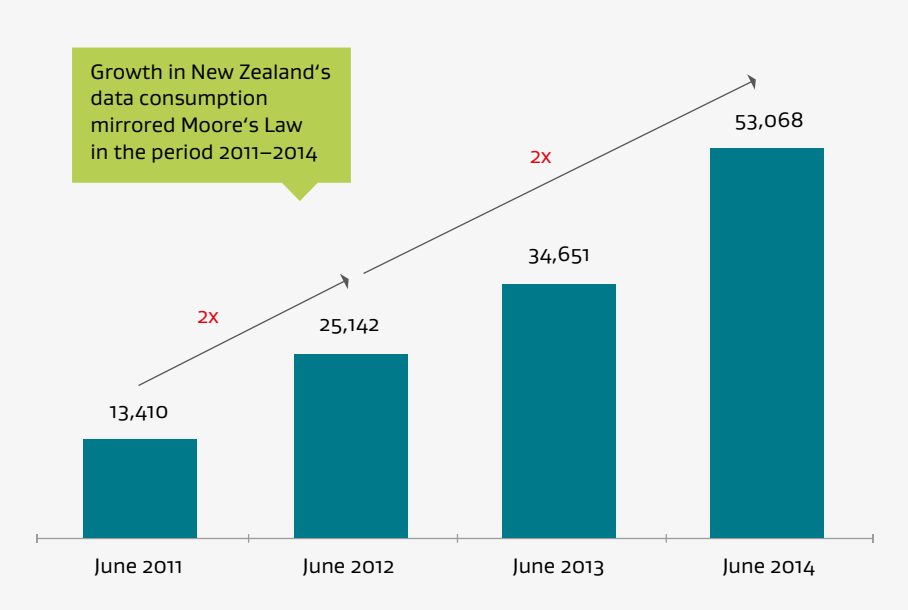
...is changing everything

Digitisation is driving change in all industries, in business models, and in the behaviour of consumers. Almost every social, economic and political activity is affected, from warfare (drones) to organising student parties (Facebook). This is driven by a combination of technologies including, but not limited to:

- The software protocols (TCP/IP) that enable the interconnection of computer networks (the Internet);
- Easy to use inter faces particularly the world wide web; touch screens and Siri;
- Cheap, fast and ubiquitous communications infrastructure (e.g. 4G mobile and ultra-fast broadband);
- Millions of businesses and individuals developing software applications;
- Remote sensing technologies (the 'Internet of Things');
- The ever increasing processing capacity of computer chips, miniaturisation of components and effectively limitless data storage, particularly when computers and smart phones have access to the cloud (which is most of the time).

The change and innovation wrought by this suite of technologies is analogous to that of the industrial revolution.

New Zealand Monthly Data Consumption, all connections
Number of terabytes per June month, 2011–2014



1. The 8080 chip at 40: What's next for the mighty microprocessor? www.computerworld.com/article/2865938/the-8080-chip-at-40-whats-next-for-the-mighty-microprocessor.html.

2. At 50 Years Old, The Challenge To Keep Up With Moore's Law www.npr.org/blogs/alltechconsidered/2015/04/20/400988928/at-50-years-old-the-challenge-to-keep-up-with-moore-s-law.

Firms and organisations not classified as part of the ICT industry, but could be...

The boundary between businesses viewed as 'ICT' businesses and those which are primarily digitally enabled is increasingly blurred

Selected examples of digitised businesses and organisations

Firm	Industry	Digital footprint
BNZ	Banking	BNZ has seen huge customer adoption of digital banking with 88 million interactions through our award winning digital channels in the last year, 65% of these were via mobile. Customers are also increasingly seeking advice online. BNZ Community, a New Zealand-first, enables conversations about money and finance, and encourages peer-to-peer support in banking. Source: BNZ.
Ezibuy.co.nz	Catalogue apparel retailer	EziBuy has been trading online for the last 18 years and uses state of the art technology and practices. It consistently ranks in the top 5 trading sites for apparel and accessories in New Zealand. Source: Ezibuy Chief Executive.
Air NZ	Travel	Air New Zealand has been at the forefront of digital innovation over several decades. As one of the country's largest online merchants, the airline has developed a multi-billion dollar online sales channel that not only drives the majority of domestic and short-haul flight revenue but has evolved to incorporate a range of ancillary product options. Innovation in mobile is delivering a rapidly growing booking channel and the Air NZ Mobile App facilitates key day-of-travel actions like check-in, changing flights, aircraft boarding and even ordering coffee at the Koru Lounge. Source: Air New Zealand.
NZX	Capital markets	All NZX capital markets transactions are electronically matched, reported and cleared – over $35 billion in 2014. NZX Energy provides twenty-four seven trading, pricing, clearing and reconciliation of spot market electricity as well as supporting services using its proprietary systems and technologies. NZX Agri provides farmers and other agri-sector businesses with online access to news, research and data. Source: NZX.
Inland Revenue	Government	Inland Revenue has a clear understanding of the ever-increasing customer and stakeholder expectations regarding speed of change and service offerings in the online, mobile and digital channels. We have recently introduced a new mobile app, myIR mobile, which provides a number of services for GST customers using their iOS mobile device. Source: Inland Revenue Chief Technology Officer.

Network Readiness Index Rankings: business environment

New Zealand ranks 17th in the world in terms of our overall network readiness*, and scores highly or very highly in political, regulatory, business and innovation environments, infrastructure and skills.

Overall	Sub-indexes and pillars			
Network Readiness Index	**Political and regulatory environment**	**Business and innovation environment**	**Infrastructure**	**Skills**
1 Singapore	**1 New Zealand**	1 Singapore	1 Norway	1 Finland
2 Finland	2 Singapore	2 United Arab Emirates	1 Taiwan	2 Singapore
3 Sweden	3 Luxembourg	3 Hong Kong SAR	3 Sweden	3 Switzerland
4 Netherlands	4 Finland	4 Canada	4 United States	4 Belgium
5 Norway	5 United Kingdom	5 United States	5 Finland	5 Qatar
6 Switzerland	6 Norway	**6 New Zealand**	6 Canada	6 Netherlands
7 United States	7 Netherlands	7 Norway	6 Australia	**7 New Zealand**
8 United Kingdom	8 Japan	8 Netherlands	6 Iceland	8 Ireland
9 Luxembourg	9 Switzerland	9 United Kingdom	**9 New Zealand**	9 Canada
10 Japan	10 Sweden	10 Switzerland	10 Switzerland	10 Germany
11 Canada	11 Canada	11 Finland	11 Korea, Rep.	11 Hong Kong SAR
12 Korea, Rep.	12 Hong Kong SAR	12 Taiwan	12 Austria	12 Norway
13 Germany	13 Germany	13 Ireland	13 Germany	13 Iceland
14 Hong Kong SAR	14 Ireland	14 Chile	14 Netherlands	14 France
15 Denmark	15 Australia	15 Israel	15 United Kingdom	15 Japan
16 Australia	16 Denmark	16 Qatar	16 Malta	16 Estonia
17 New Zealand	17 Qatar	17 Iceland	17 Japan	17 Australia
18 Taiwan	18 Austria	18 Denmark	18 Luxembourg	18 Luxembourg
19 Iceland	19 Rwanda	19 Sweden	19 Singapore	19 Denmark
20 Austria	20 United Arab Emirates	20 Portugal	20 Denmark	20 Barbados

*The Network Readiness Index measures a country's performance in leveraging ICT to boost competitiveness and wellbeing.

Source: The Global Information Technology Report 2015, World Economic Forum.

Network Readiness Index Rankings: usage and impacts

New Zealand scores less well on individual and business usage and economic impacts

Sub-indexes and pillars				
Individual usage	**Business usage**	**Government usage**	**Economic impacts**	**Social impacts**
1 Denmark	1 Switzerland	1 Singapore	1 Finland	1 Singapore
2 Sweden	2 Japan	2 United Arab Emirates	2 Sweden	2 United Arab Emirates
3 Norway	3 Sweden	3 Korea, Rep.	3 Switzerland	3 Netherlands
4 United Kingdom	4 Finland	4 Bahrain	4 Singapore	4 Korea, Rep.
5 Finland	5 Germany	5 Qatar	5 Netherlands	5 Estonia
6 Luxembourg	6 Netherlands	6 Estonia	6 Israel	6 United Kingdom
7 Netherlands	7 United States	7 Japan	7 United States	7 Norway
8 Iceland	8 Denmark	8 Saudi Arabia	8 Luxembourg	8 Taiwan
9 Korea, Rep.	9 Israel	9 Malaysia	9 Germany	9 Canada
10 Switzerland	10 Norway	**10 New Zealand**	10 Korea, Rep.	10 Qatar
11 Singapore	11 Luxembourg	11 Luxembourg	11 Norway	11 United States
12 Hong Kong SAR	12 Korea, Rep.	12 Rwanda	12 Japan	12 Finland
13 Japan	13 Austria	13 Netherlands	13 United Kingdom	13 Japan
14 Bahrain	14 Singapore	14 United States	14 Canada	14 Australia
15 Australia	15 Belgium	15 Israel	15 ireland	**15 New Zealand**
16 Estonia	16 United Kingdom	16 United Kingdom	16 Hong Kong SAR	16 Sweden
17 Germany	17 Taiwan	17 Finland	17 Taiwan	17 Bahrain
18 United States	18 Hong Kong SAR	18 France	18 Denmark	18 Hong Kong SAR
19 Qatar	**19 New Zealand**	19 Oman	19 Barbados	19 Israel
20 United Arab Emirates	20 France	20 Sweden	20 Belgium	20 Luxembourg
21 Austria	21 Iceland	21 Taiwan	21 Iceland	21 Uruguay
22 New Zealand	22 Ireland	22 Canada	22 France	22 Portugal
23 Malta	24 Australia	23 Australia	**26 New Zealand**	23 Chile

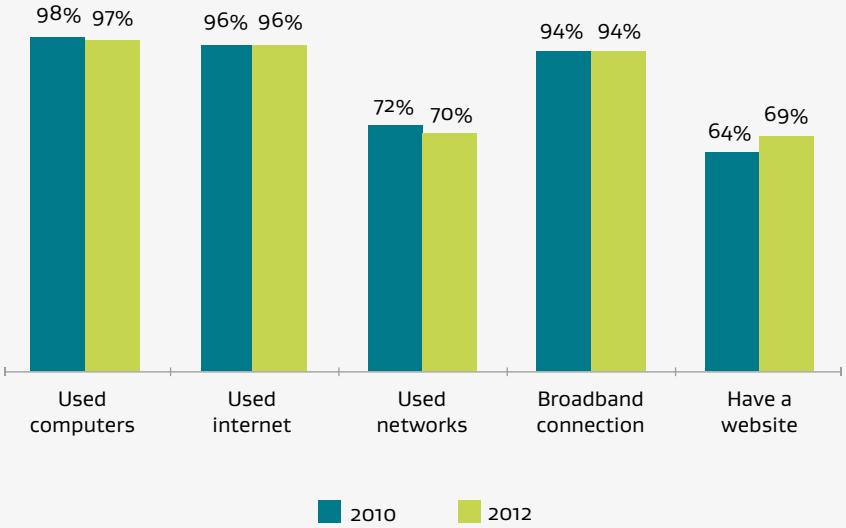
Source: The Global Information Technology Report 2015, World Economic Forum.

Business connectivity

New Zealand businesses have high levels of connectivity

Business use of internet

% New Zealand business; 2010, 2012



Statistics New Zealand Business Operations Survey 2012

- 97% used computers, down from 98% in 2010.
- Increased use of smartphones and other devices may mean businesses are no longer using computers to the same degree they used to.[1]
- 96% used the Internet, the same as in 2010.
- 70% used networks, down from 72% in 2010, mostly due to an increase in the number of businesses that did not know if they used networks.
- 69% had websites, up from 64% in 2010. Businesses now have cheaper and easier access to the tools, systems, and information for creating and maintaining websites.[2]
- 94% used broadband connections, similar to 2010. Lack of broadband access in some areas could be why broadband connections have not increased.
- Research released by the Innovation Partnership shows that everyday Kiwi businesses could add $34 billion to the New Zealand economy if they made effective use of the Internet.[3]

1. Intergen (2012). The engaged web in New Zealand 2012. Available from www.intergen.co.nz.

2. MYOB Business Monitor (2012), available from www.myob.co.nz.

3. The state of the New Zealand digital economy (Sapere, 2014). Available from www.innovationpartnership.co.nz.

*Note: total survey sample is 36,360 firms with six or more employees; 630 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2013).

ICT and business productivity

New Zealand is well placed to benefit from digital technologies, but *'there is a difference between 'use of Internet' and the ability to extract economic value from it'* – IT entrepreneur

International research indicates that:

- Most of the economic value the Internet creates falls outside of the technology sector, and companies in more traditional industries capture 75% of the benefits.[1]
- The internet accounts for 21% of GDP growth in mature countries over the past five years.[2]
- Countries at an "advanced stage of digitisation" derive 20% greater economic benefits than countries that are just beginning to digitise their economies.[3]

Recent local research indicates that New Zealand firms that make more extensive use of the internet are 6% more productive than average firms in their industry.[4]

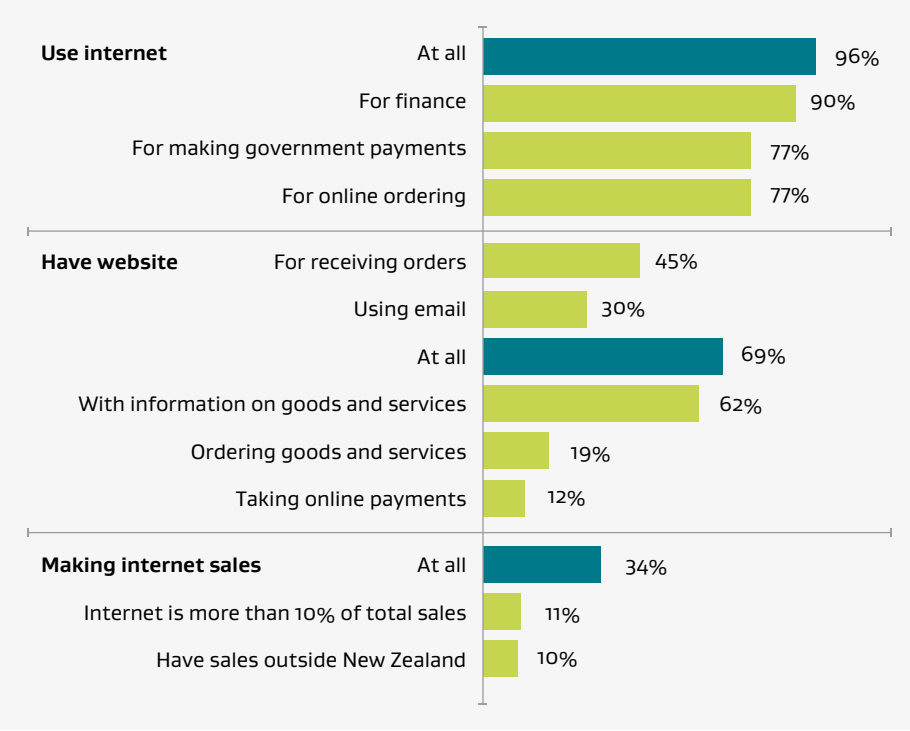
- ICT is revolutionising the way that services operate. However, New Zealand has yet to experience the full productivity benefits of ICT, and the survey found that this is in part due to the lack of skilled ICT professionals and ICT-savvy managers, and the high initial cost of ICT services. Streamlining the process for filling ICT jobs from overseas and helping ICT graduates to adapt to the workplace would increase the number of employees and managers with ICT skills. Cloud computing has great potential to reduce the costs of setting up ICT services, but firms need encouragement to adopt cloud-based services.

Murray Sherwin, Chair, New Zealand Productivity Commission, quoted in the New Zealand Herald, March 12, 2014

See also New Zealand Productivity Commission: Boosting Services Sector Productivity, available from www.productivity.govt.nz

Use of Internet services within economically significant firms

% use, 2012



1. Internet Matters – the Net's sweeping impact on jobs, growth and prosperity. McKinsey Global Institute 2011.
2. Ibid.
3. Bahat El-Darwiche, Milind Singh, Sandeep Ganediwalla, 2012, Digitisation and Prosperity. Strategy and Business Issue 68.
4. Sapere 2014. Available from www.innovationpartnership.co.nz.

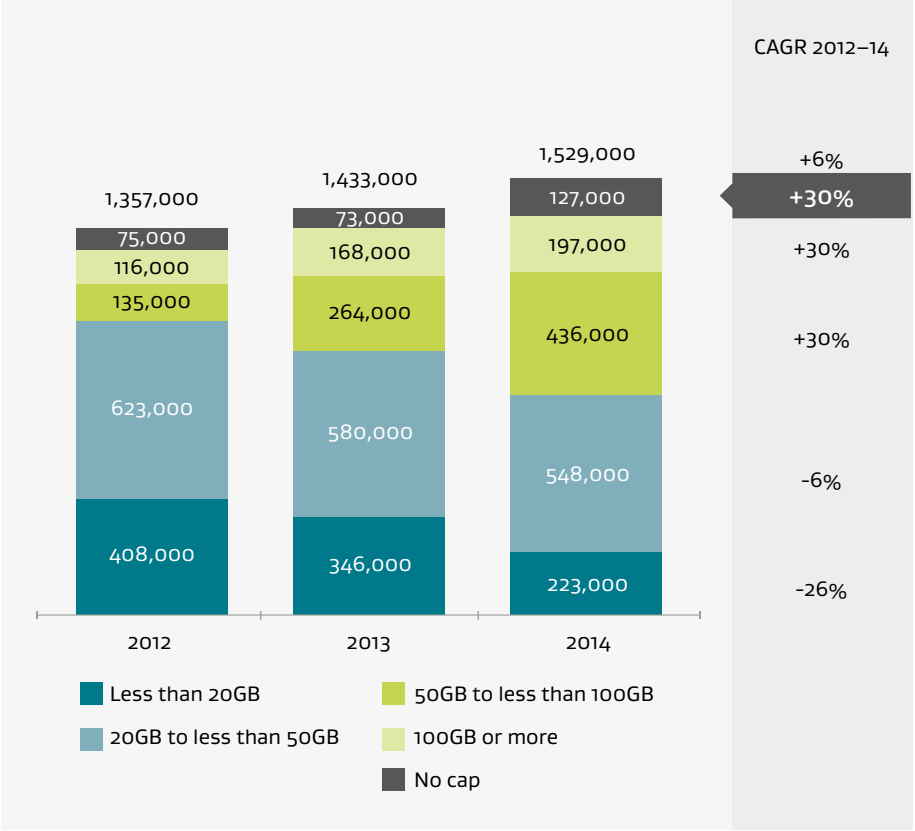
Source: Business Operations Survey (2012), Sapere analysis.

Broadband connections

Broadband connections are growing; both households and businesses are moving to higher data caps and uncapped connections

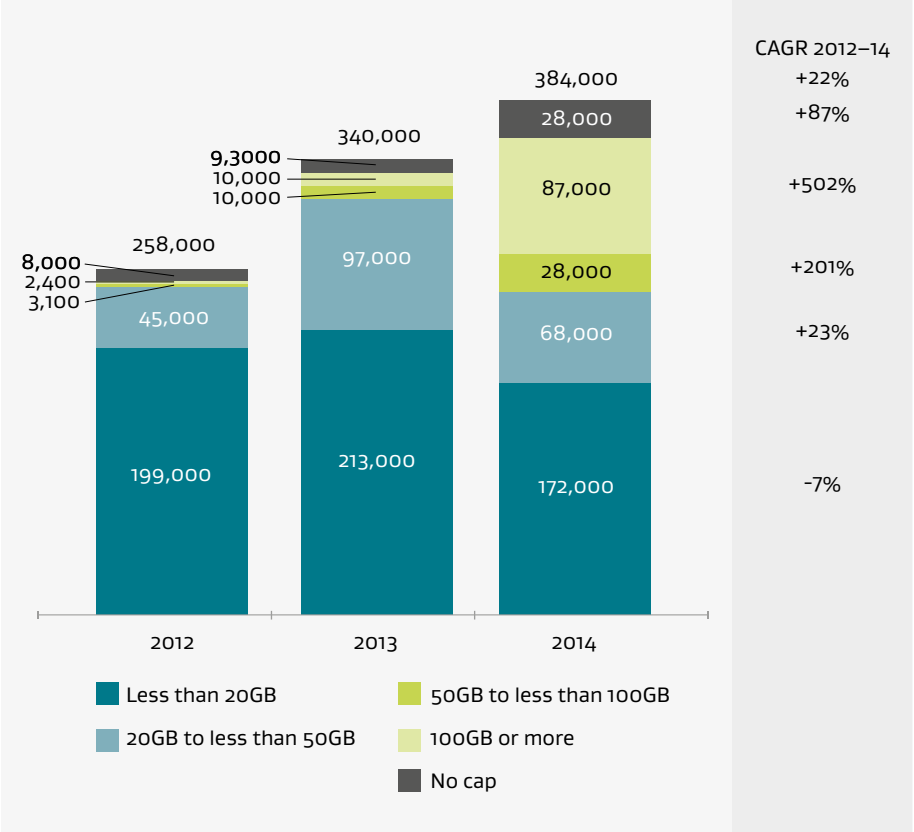
Residential (household) broadband connections by data cap

Number connections, 2012–2014



Business and government broadband connections by data cap

Number connections, 2012–2014

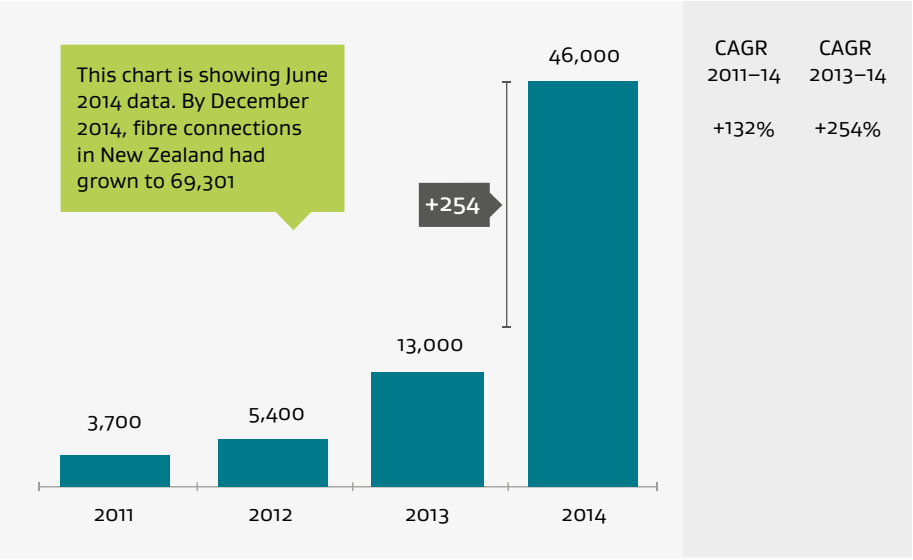


Source: Statistics NZ.

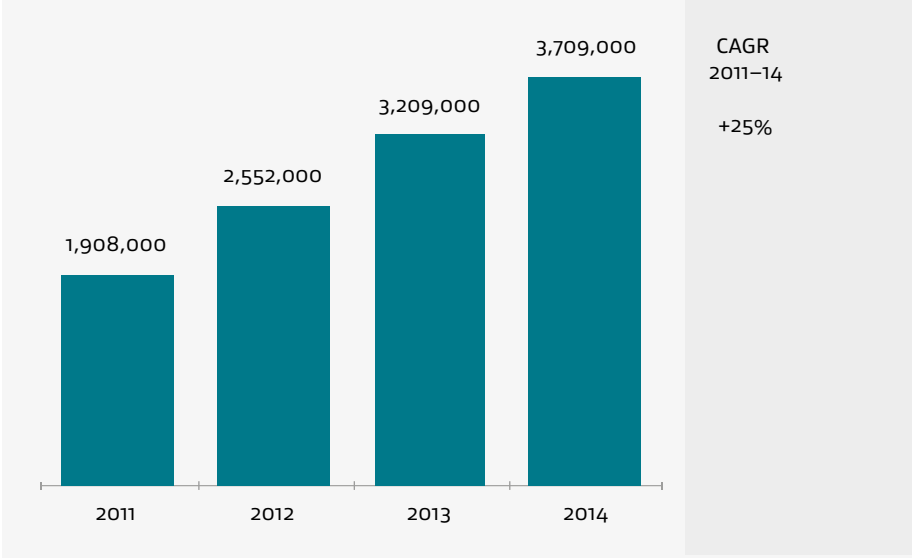
Fibre optic and mobile connections

Growth in fibre optic connections is taking off; mobile (smart phone) Internet access is becoming the norm

Fibre optic connections 2011–2014 (June years)
Number subscribers



Mobile internet connections 2011–2014[1]
Number subscribers



Source: Statistics NZ.

1 Includes all connections via a mobile handset. Excludes mobile wireless connections via a data card, dongle, USB modem.

ICT occupations across all New Zealand sectors

Jobs in ICT related occupations in all sectors grew by 18,000 in the 10 years to 2014, driven by 'Software and Applications Programmers' and 'ICT Business and Systems Analysts'

ICT occupations	Number		Change		ICT occupations	Number		Change	
	2004	2014	CAGR 04–14	Abs		2004	2014	CAGR 04–14	Abs
ICT Support Technicians	10,364	8,337	-2%	-2,027	Electronics Trades Workers	1,725	3,024	6%	+1,299
Software and Applications Programmers	8,388	21,500	10%	+ 13,111	ICT Support and Test Engineers	1,377	1,645	2%	+268
ICT Business and Systems Analysts	7,420	12,393	5%	+4,973	Telecommunications Engineering Professionals	1,309	1,469	1%	+160
Database and Systems Administrators and ICT Security	5,547	6,116	1%	+569	ICT Trainers	1,117	589	-6%	-528
ICT Managers	5,071	7,110	3%	+2,040	Electronics Engineers	1,101	925	-2%	-176
Telecommunications Trades Workers	2,981	3,156	1%	+175	Multimedia Specialists and Web Developers	989	2599	10%	+1,610
Electronic Engineering Draftspersons, Technicians	2,786	1,464	-6%	-1,322	Web Designers	708	1014	4%	+306
ICT Sales Professionals	2,769	1,012	-10%	-1,757	ICT Sales Assistants	183	182	0%	-1
Computer Network Professionals	2,719	2,299	-2%	-420	Telecommunications Technical Specialists	106	68	-4%	-39
					Total	**56,661**	**74,903**	**3%**	**+18,242**

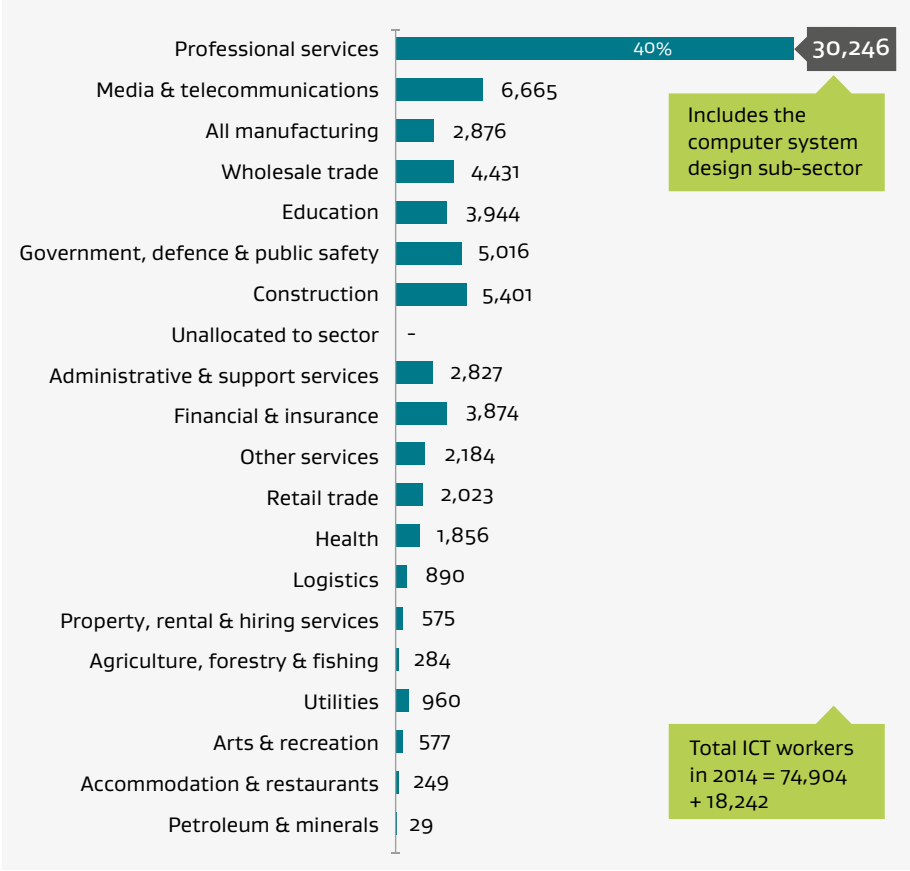
Source: Employment Estimates, MBIE.

Total ICT workers by sector, 2004 versus 2014

The economy has added 18,242 workers in ICT occupations since 2004; 40% are employed in the professional services sector

Number of workers in ICT occupations by sector
ICT workers; 2004

Number of workers in ICT occupations by sector
ICT workers; 2014

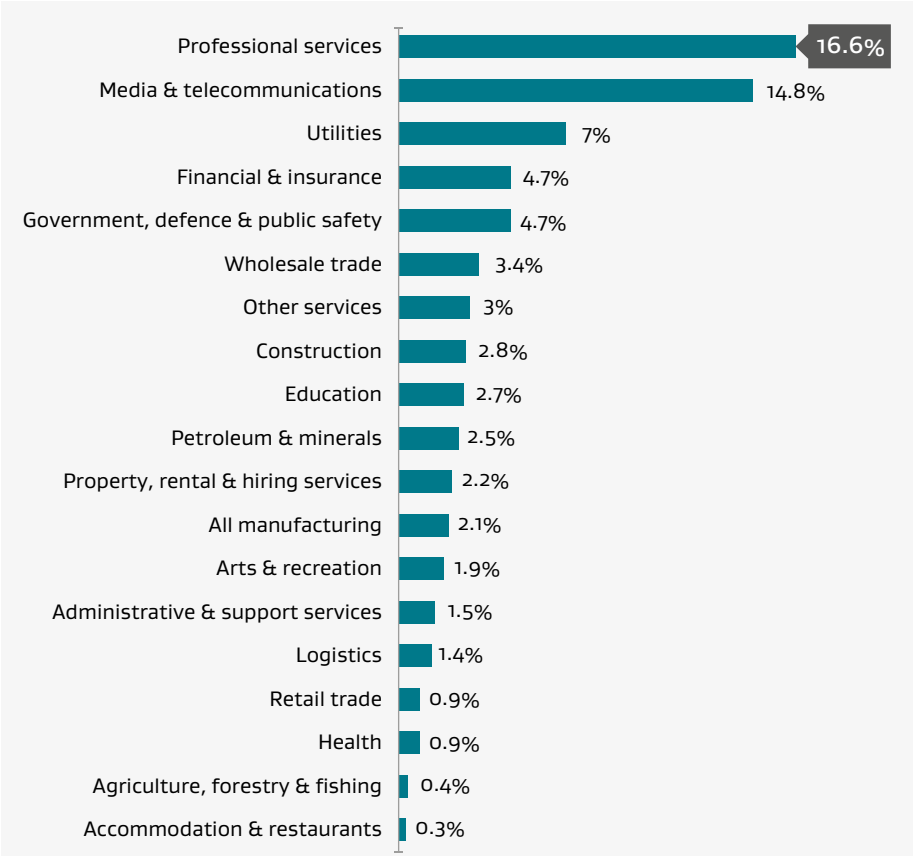


Source: Detailed Employment Estimates, MBIE analysis, calculated from the Household Labour Force Survey and the Linked Employer-Employee Data and historical censuses.

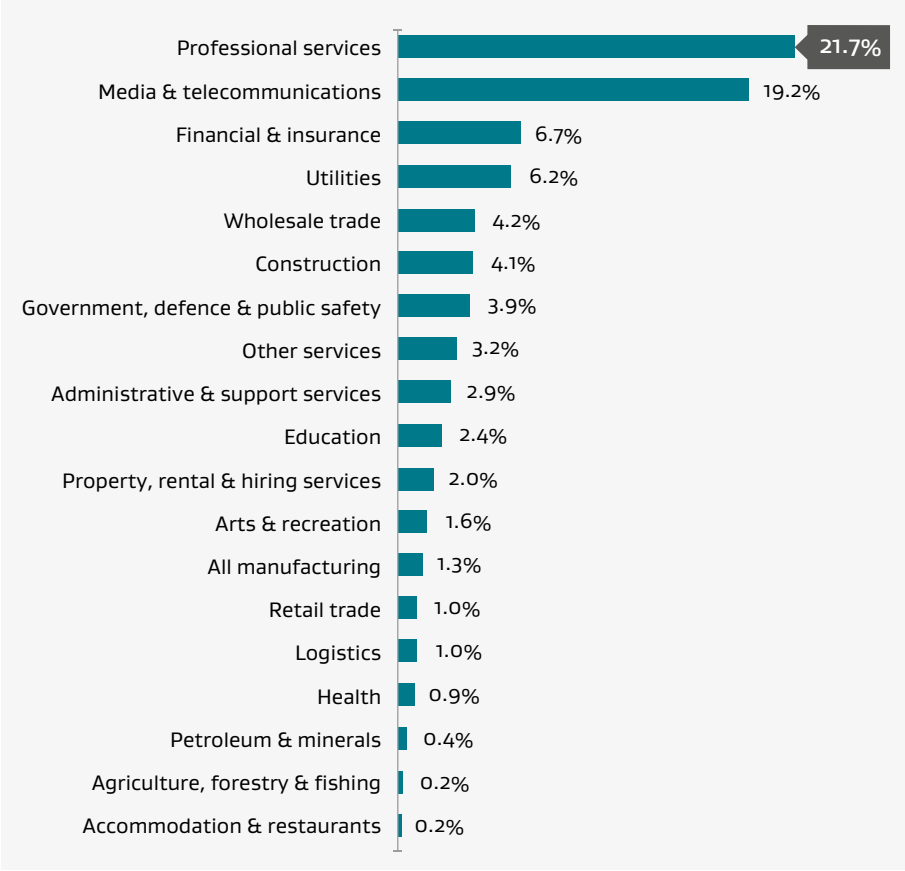
ICT workers as a percentage of total sector workforce

Professional services and media and telecommunications are the most ICT job intensive sectors

ICT workers as a % of total sector workforce, 2004
% ICT workers; 2004



ICT workers as a % of total sector workforce, 2014
% ICT workers; 2014

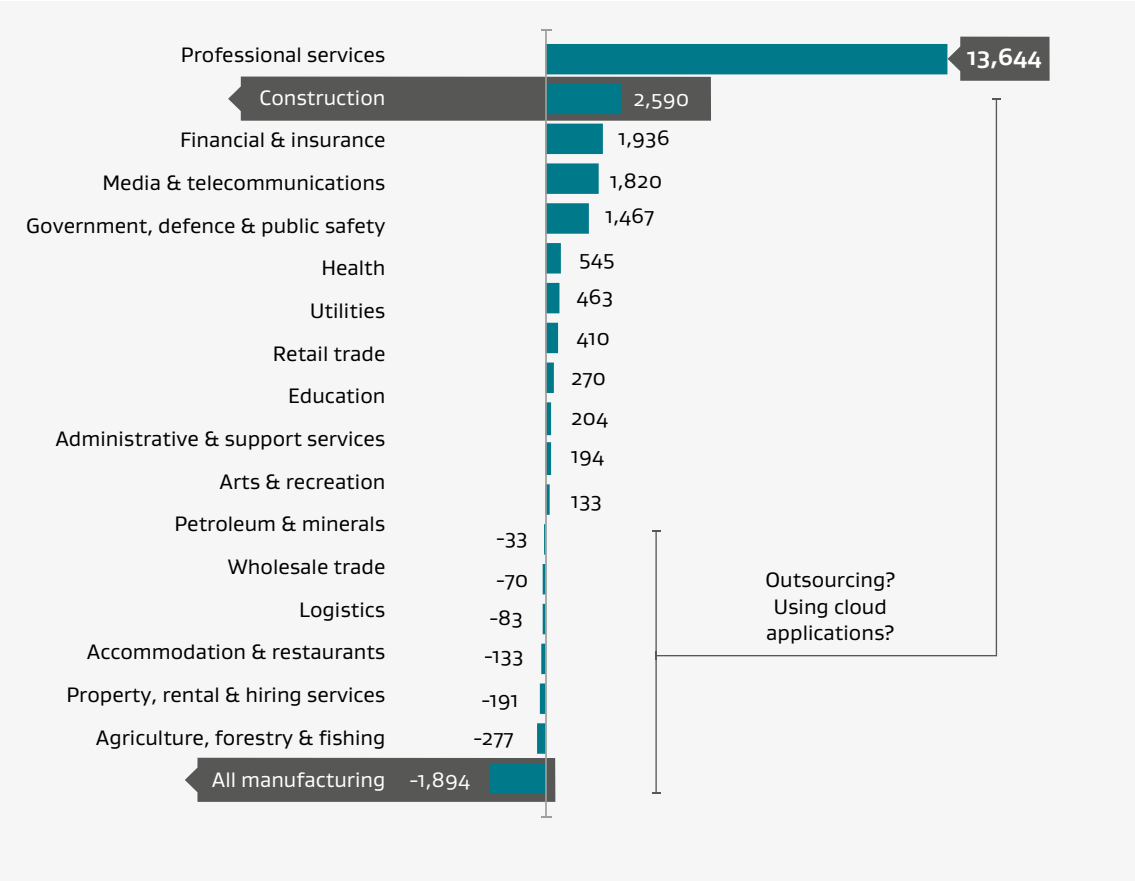


Source: Detailed Employment Estimates, MBIE analysis, calculated from the Household Labour Force Survey and the Linked Employer-Employee Data and historical censuses.

Absolute change in ICT jobs by sector, 2004–2014

Job growth in the decade to 2014 driven by 'Professional Services', 'Construction', 'Finance and Insurance', 'Media and Telecommunications' and 'Government'

Absolute change in number of workers in ICT occupations by sector
ICT workers; 2004–2014

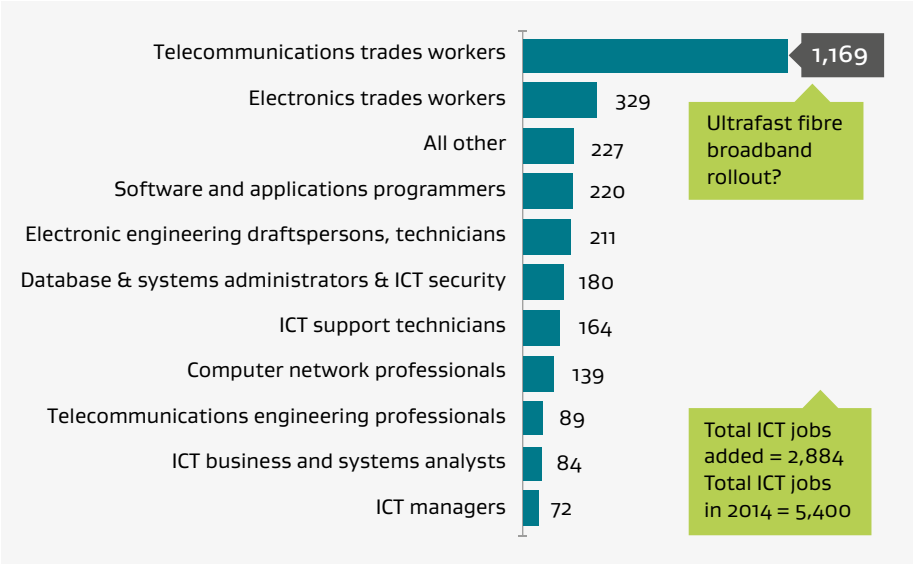


Source: Detailed Employment Estimates, MBIE analysis, calculated from the Household Labour Force Survey and the Linked Employer-Employee Data and historical censuses.

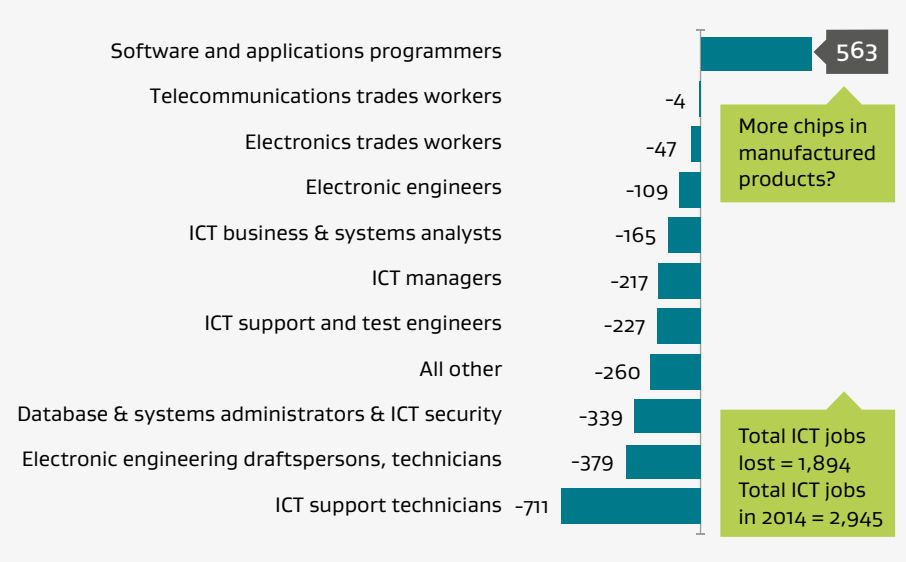
Construction and manufacturing: change in ICT workers by occupation

Construction added 2,590 ICT jobs, driven by telecommunications trades workers; manufacturing lost jobs across all ICT occupations except programmers

Construction: absolute change in number of workers in ICT
Number of workers by occupation, 2004–2014

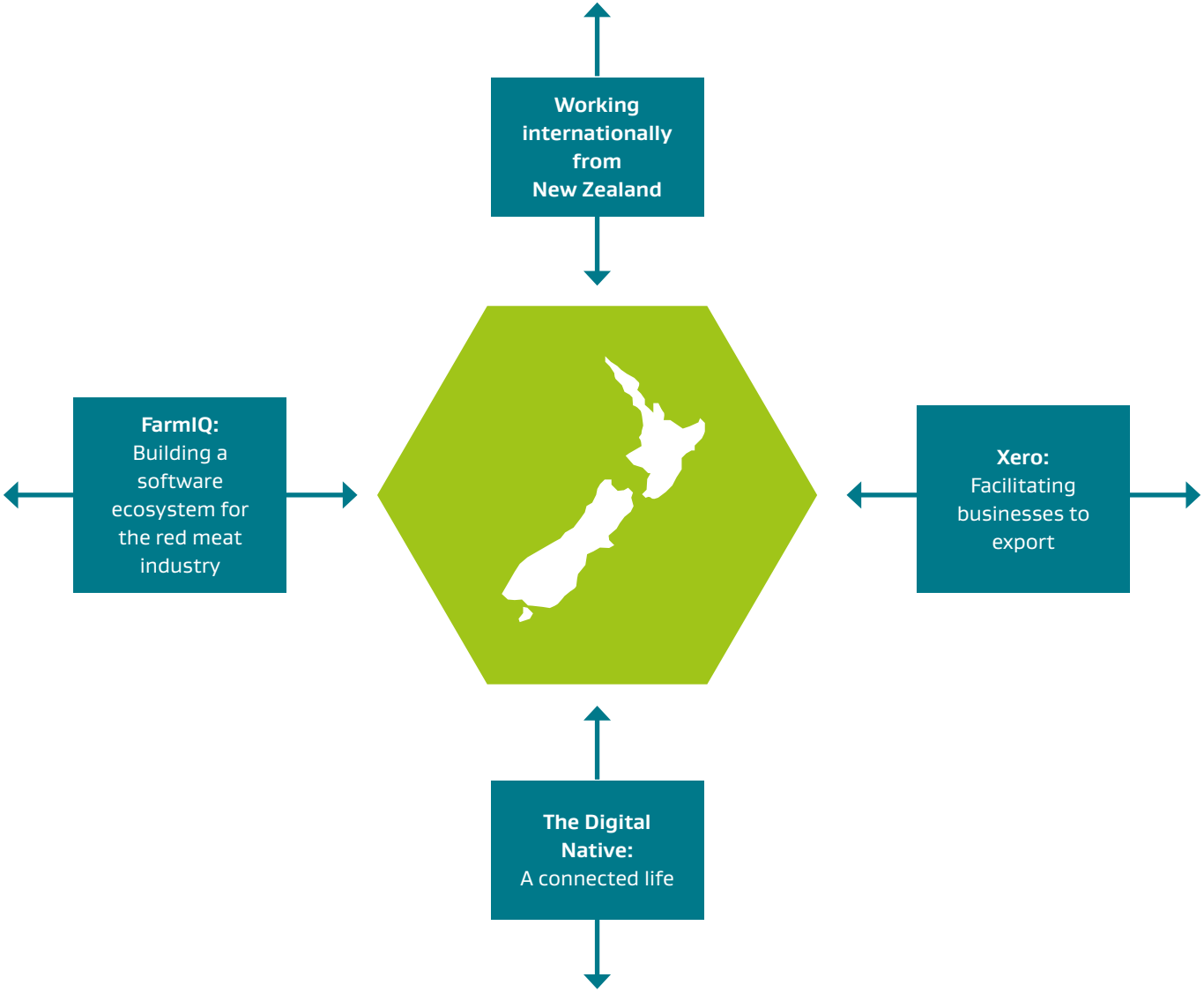


Manufacturing: absolute change in number of workers in ICT
Number of workers by occupation, 2004–2014



Source: Detailed Employment Estimates, MBIE analysis, calculated from the Household Labour Force Survey and the Linked Employer-Employee Data and historical censuses.

Case studies: digital business, digital lives



Case Study: FarmIQ: driving the use of ICT along the red meat supply chain

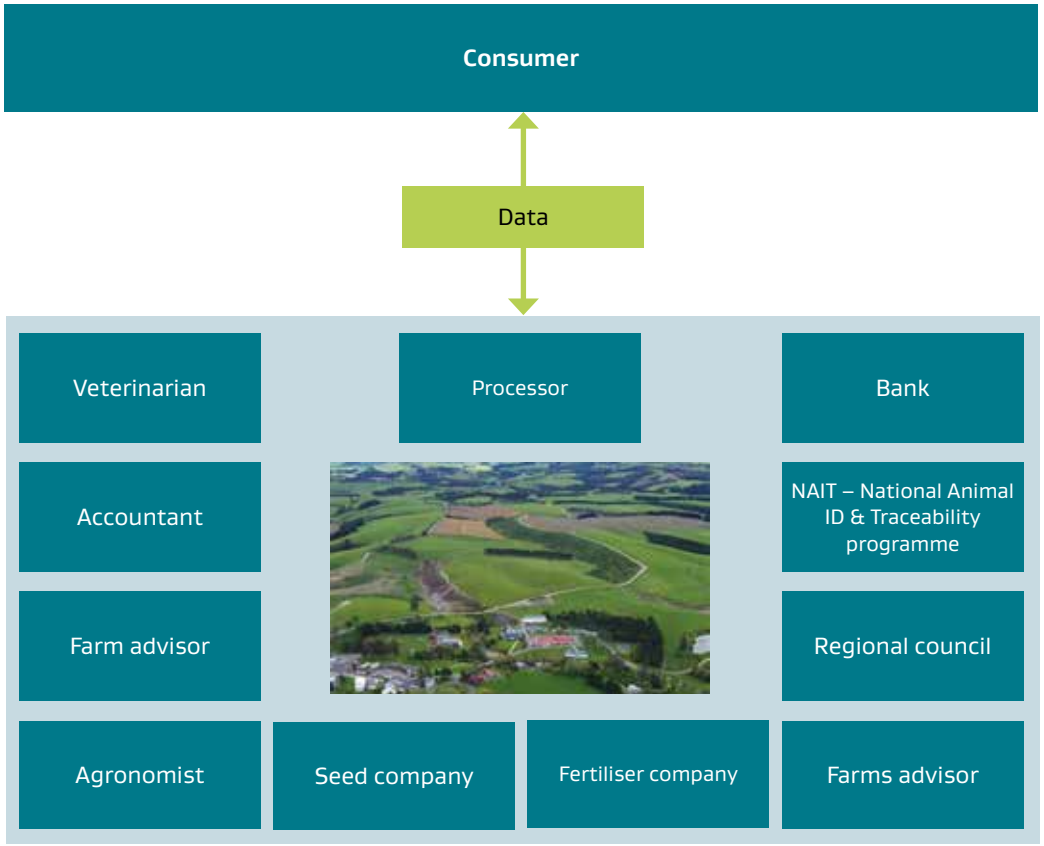
The FarmIQ System uses digital technologies to enable collection and analysis of farm information to improve all aspects of farm management

Simplified model of the red meat farming ecosystem

The past

The rise and rapid adaptation of New Zealand protein farming [in the late 19th/ early 20th centuries] were intertwined with the development of finance, processing, distribution and shipping to form a sophisticated mechanism connecting the farms to their markets.

James Belich, Paradise Reforged, (2001)



The future

FarmIQ, owned by Silver Fern Farms and Landcorp, aims to create a demand-driven, integrated value chain for red meat that could grow the sector by 50% by 2025.

By using a range of information and communication technologies, FarmIQ is digitising all aspects of farm management, including interactions with all players in the wider ecosystem, creating "a sophisticated digital mechanism connecting the farms to consumers".

The FarmIQ programme is part of the Primary Growth Partnership (PGP); a joint venture between government and industry, that invests in long-term innovation programmes to increase the market success of the primary industries. See www.mpi.govt.nz and www.farmiq.co.nz.

FarmIQ Applications

The FarmIQ System is a farm information hub that supports productivity gains and the ability to consistently deliver premium-quality meat to meet consumer demands

Working map

The interactive paddocks map is an easy way of recording any farm information.

Compare and benchmark

Get reports comparing performance of your stock, paddocks and forages; for example compare animal performance by breed, supplier, forage or animal health treatment, or benchmark by season, region or farm type.

Diary with tasks

An electronic calendar to securely record key farm activities and assign and review tasks.

Management dashboard

Set up a personalised dashboard of selected reporting, quick links and task management – to help you easily see your key indicators.

Beef EQ

Farm and processor information are linked up in a handy dashboard – so you can drill down and see which groups of animals are earning you more.

Carcass performance (Heat map)

View carcass performance reports – for a line or several lines over a season – and easily display trends such as grading.

Individual analysis drives performance

Drill down into carcass performance report to see more about individual animals.

Liveweight gain

Track liveweight gains and compare for selected groups of animals, such as different breed groups.

Carcass disease and defect

Easily see disease and defect trends and compare them against benchmarks – to identify problems that are costing you money.

Paddock history

Easily see a record of paddock events and track pasture covers.

Linking information

Enter farm information once and see how it links with other information to give you reporting on several kinds of animal and paddock performance.

Multi-farm reporting

Consolidated reporting of multiple farms under single ownership.

Case study: the digital native

For the typical year 13 high school student, high speed connectivity and powerful computing is the norm; effectively she is always connected

	Description	Comment
Technology	ASUS laptop. One terabyte external data storage. iPhone 6 on monthly plan, 400 minutes calling, 1.2 gigabytes data. Wireless network at home. Household connectivity: cable broadband with 80 gigabyte monthly data cap.	Third computer in five years. Seventh mobile phone in eight years; fourth smart phone. Household likely to upgrade to uncapped naked broadband and discontinue landline in next six months. Note that iPhone purchase and monthly fees paid for through 12 hours part-time work weekly.
Applications used for school	Google docs, email, movie-maker, world wide web for research.	Wireless network at school. All written assignments use Google docs and shared with teachers. Teachers able to see progress of work online.
Applications/websites used at home	Google docs (homework); Facebook, Snapchat, Skype, email, Spotify, iTunes, Trade Me, Ebay, Gmail, Youtube, other content streaming sites.	Hours watching traditional television in a typical week: less than one. Hours watching online content per week: 10–15. When not at home, most applications accessed via iPhone.
Personal uses of connectivity	Online purchases (clothes, apps), watching online video content, social networking, gaming (Minecraft), photos, organising most aspects of life.	There is a perception that clothes from the US are a) cheaper, and b) much more likely to be unique (not worn by others) than clothes bought in New Zealand shops.

Case study: Xero

Like other successful technology companies, Xero is focused on using its technology platform to build an ecosystem with global reach

The ecosystem business model

Today's business platforms enable business. They don't just sell at you or lock customers in. They enable entrepreneurship, reputation development, and personal and professional growth, and they do it at extraordinary scale. In short, as well as providing a new way to scale business they bring value to all parties...

Haydn Shaughnessy, Why Amazon Succeeds, Forbes.com

All businesses operate in a network (or ecosystem) of suppliers, service providers, customers and interactions with government. The depth and sophistication of this network and the efficiency with which the various players interact is a key factor in creating competitive advantage.

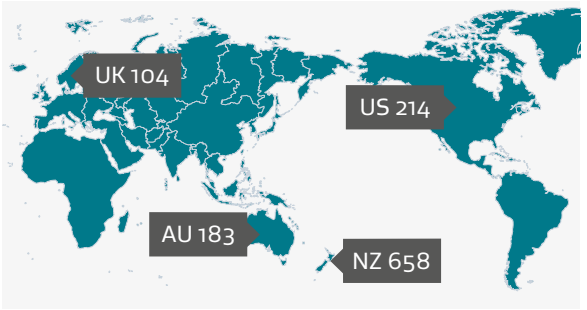
The global giant technology firms – Apple, Microsoft, Google, Amazon, Facebook – have all used their technology platforms to create an extensive and interlocking ecosystem. Participants in the ecosystem are not just customers or suppliers 'along the value chain', but individuals and businesses who use the technology platforms to create their own economic and/or social value, in the process also building the value of those technology giants. Just three examples include:

- Individuals and businesses creating Youtube channels for a share in advertising revenue;
- Vendors who sell through Amazon and the writing community that self-publishes to Amazon;
- Developing apps for sale through the Apple App Store.

Similarly Trade Me has created an ecosystem which encompasses both the community of buyers and sellers and the individuals and businesses that utilise the Trade Me platform to build their own businesses.

Xero staff by market

Number staff, 2015



Growth story

- Subscription revenue CAGR of 110% over six years. Revenues grown 81% in the last year to over $120M.
- Doubled export revenue in the last year to $82 million.
- 475,000 customers globally, 190,000 added in the last twelve months.

Expanding global markets

- Overseas markets are becoming increasingly significant. 70% of Xero's customers are based outside New Zealand in 180 countries and generated 70%+ of FY15 subscription revenue.

Global opportunity

- Enormous opportunity on offer in current markets: 36 million small businesses need to manage their accounting and finances.
- Xero is well positioned to realise this opportunity: in the last two years it has invested over $100 million in R&D (gross, including capitalised) and has built capability, adding over 750 new roles.

Source: Xero.

The Xero ecosystem

Xero's expanding international footprint is creating opportunities for New Zealand app developers and services businesses to export

The Xero business model

In the narrow sense of delivering software applications to its customers, Xero operates the software-as-a-service business model where customers pay a subscription to access Xero's small business solutions.

In the wider sense, like the global technology giants, Xero is focused on building a global ecosystem that creates value for customers and provides opportunities for innovation and entrepreneurship and channels to international markets for New Zealand's businesses.

Building on the Xero ecosystem in order to leverage their fast growing global customer and partner base has been a key strategic channel to market for Vend internationally.

VendHQ.com.

Utilising Xero's international market reach

Xero's platform and international market reach is enabling New Zealand businesses to generate overseas income.

500+ New Zealand accounting and bookkeeper partners are providing services to 10,000+ small business customers outside of New Zealand.

Add-on partners

75+ New Zealand apps have connected to Xero's platform and are exporting via Xero's distribution channels.

Source: Xero.

Driving productivity and value creation in the small business economy

Xero, along with many other New Zealand IT product firms, is playing a key role in driving the digitisation of the economy

The smart use of ICT by small businesses drives productivity, efficiency and cash flow

- 58% of Xero customers in New Zealand have grown, at least doubling their turnover and profitability in the last two years.
- In 2014, $70 billion of New Zealand transactions were paid through Xero's platform, reflecting ¼ of New Zealand total GDP.
- Xero's 138,000 users in New Zealand are getting paid more than two weeks faster than they were in late 2011.
- +400 business apps integrated within the Xero ecosystem are delivering business insights and efficiencies to small businesses.
- Xero's data driven insights act as a barometer on the health of the New Zealand small business economy and have helped guide policy discussions.
- Research indicates that with Xero, small businesses are more in control of their finances and likely to succeed, grow or employ more staff, driving growth in the economy.

Source: Xero.

With a true cloud platform for rural our goal is to drive more industry collaboration linking up key farming software tools that farmers already use in the single ledger. Together we can deliver more to farmers and help them increase profitability.

Xero blog post by Ben Richmond.

Case study: working internationally from home in New Zealand

Digital technology makes it possible to manage international business teams from New Zealand, although face-to-face communication is still vital

	Description	Comment
Business	Multinational infrastructure asset management software company with global turnover of US$500 million.	Company has five employees in New Zealand, in a range of roles, including one person involved in software development located in a New Zealand regional city.
Role	Services Director, Implementation Services Management, South East Asia and Pacific regions.	Located in Wellington working from home, reporting to senior management based in the UK and the US. The team managed is comprised of five people located in Australia.
Technology	Laptop and large monitor. 500 gigabyte external data storage. iPhone 6 on monthly plan. Wireless network at home. Household connectivity: cable broadband with unlimited data.	Connectivity is generally good with the occasional outage. Now most things based in the cloud, little need for data storage at home. Despite remote management, this is still a people business, so personal communications is vital. Other members of the household probably use more data than that required for work.
Typical working day	Start at 7am to enable communications with the US. Work through to between 3pm and 5pm. Twice a week work in the evenings to work with Australia, Asia or the UK.	Tasks include management of staff, governance of projects, pre-sales, and technical problem solving.
Applications used	Skype for business (voice over IP and instant messaging); email; MS office products; Sharepoint for collaborative working and some proprietary solutions.	Skype for business used for connecting with colleagues and meeting with customers.
Lifestyle	Live in New Zealand for lifestyle reasons, and work for an international company because the work is interesting with good opportunities and is well paid.	Travel approximately one week a month, mostly to Australia and the US. Complex issues require face-to-face communication.

Appendix

ICT definition

OECD definition for information and communications technology (ICT)

The OECD definition includes telecommunications goods and services, but excludes internet publishing and broadcasting. The ICT sector is defined as:

› goods and services which enable the function of information processing and communication by electronic means including transmission and display

› goods which use electronic processing to detect, measure and/or record physical phenomena or control a physical process.

Applying the OECD's definition, the four industries below are classified as part of the ICT sector.

Note: how statisticians define the industry and how the industry sees itself may be very different.

ANZSIC code*	Description	New Zealand examples
Telecommunications		
J580100	Wired telecommunications network operation	Chorus
J580200	Other telecommunications network operation	2Degrees
J580900	Other telecommunications services	CallPlus
J591000	Internet service providers and web search portals	Inspire.net
F349300	Telecommunication goods wholesaling	Atlas Gentech
M70000	Computer system design and related services	Orion Health
IT services (other)		
L663900	Other goods and equipment rental and hiring not elsewhere classified	Vidcom New Zealand
J542000	Software publishing	Pingar
J592100	Data processing and web hosting services	Revera
J592200	Electronic information storage services	Paymark
S942200	Electronic (except domestic appliance) and precision equipment repair and maintenance	Kinetics Group Ltd
ICT manufacturing		
C242100	Computer and electronic office equipment manufacturing	Smartrak
C243100	Electric cable and wire manufacturing	General Cable Superconductors
C242900	Other electronic equipment manufacturing	Rakon
C242200	Communication equipment manufacturing	Tait Communications
C241900	Other professional and scientific equipment manufacturing	Atrak Group
IT wholesaling (Mainly importers, equipment providers)		

*Australia and New Zealand Standard Industrial Classification 2006 (ANZSIC). Source: Statistics NZ; OECD definitions (ISIC 3.1 version).

Further reading: information on the New Zealand economy

Publication	Available from
New Zealand's Sectors Reports Series The Main Sector Reports provides Information on all sectors in the economy. In addition there are six in-depth reports on Information and Communication Technology, Construction, Petroleum and Minerals, High Technology Manufacturing, Tourism and Knowledge Intensive Services.	www.mbie.govt.nz
The Regional Economic Activity Report The Regional Economic Activity Report presents available official economic data on New Zealand's 16 regions. This annual report provides regional economic information sourced from a number of government agencies.	www.mbie.govt.nz
Regional Government Expenditure Report The Regional Government Expenditure Report provides the first ever snapshot and analysis of estimated central government spending for each region in New Zealand.	www.mbie.govt.nz
The Food and Beverage Information Project reports The project pulls together all the available information on the food and beverage industry into one place, in a form which is familiar and useful to business. Reports are available on every aspect of New Zealand's food industry, including information on export market and investment opportunities. New and updated reports are released annually.	www.foodandbeverage.govt.nz
Situation and Outlook for Primary Industries (SOPI) Published annually, this report provides up-to-date information about the performance of New Zealand's primary sectors – dairy, meat and wool, forestry, horticulture, arable and, for the first time, seafood – and gives independent forecasts of future prospects.	www.mpi.govt.nz
Tourism Satellite Account Published annually, the Tourism Satellite Account provides a picture of the role tourism plays in New Zealand, including the changing levels and impact of tourism activity, and the industry's contribution to the economy.	www.stats.govt.nz
Business Growth Agenda Future Direction 2014 The Business Growth Agenda Progress Report 2013 shows the significant progress the Government has made across each of the six areas that are critical to business success and growth: Export Markets, Capital Markets, Innovation, Skilled and Safe Workplaces, Natural Resources and Infrastructure.	www.mbie.govt.nz
Building innovation The building innovation work stream of the Business Growth Agenda aims to grow New Zealand's economy by encouraging and enabling investment in research and development, and lifting the value of public investments in science and research.	www.mbie.govt.nz

Publication	Available from
Export markets The export markets work stream of the Business Growth Agenda aims to increase exports by New Zealand businesses, which is necessary to lift New Zealand's economic growth and living standards.	www.mbie.govt.nz
Building infrastructure The building infrastructure work stream of the Business Growth Agenda aims to provide the physical platform that will support sustained economic growth.	www.mbie.govt.nz
Natural resources The building natural resources work stream of the Business Growth Agenda aims to make better use of New Zealand's abundant natural resources, so we can continue to grow our economy and look after our environment.	www.mbie.govt.nz
Skilled and safe workplaces The skilled and safe workplaces work stream of the Business Growth Agenda aims to improve the safety of the workforce and build sustained economic growth through a skilled and responsive labour market.	www.mbie.govt.nz
Building capital markets The building capital markets work stream of the Business Growth Agenda aims to ensure New Zealand has high performing capital markets that support investment, growth and jobs.	www.mbie.govt.nz

Key terms and data limitations

Defining sectors

A sector is an area of economic activity in which businesses or other organisations (e.g. government or voluntary organisations) share a similar market or produce a similar product or service. Examples are retailing (businesses that sell products directly to consumers) and telecommunications (provision of communications services using wired or wireless infrastructure).

This report uses data grouped into sectors using the Australian and New Zealand Industrial Classification codes (ANZSIC codes). A business or other type of organisation is classified to an ANZSIC code based on its predominant activity. The term 'sector' is often used interchangeably with the term 'industry'.

Sources

The numbers in this report come from multiple sources. Data sourced from Statistics New Zealand is the latest that was available as at March 2014. Some of this data is provisional and may change.

The data used covers different time periods for different metrics. For example, services exports is for the year ended Dec 2014, while labour productivity is for the year ended March 2013.

Customised data for ICT

ICT is a cross-cutting sector combining several ANZSIC codes. Customised data has been provided by Statistics New Zealand for this report for GDP only. The report uses, as the main unit of analysis, the Australia and New Zealand Industrial Classification (ANZSIC) code M7000: Computer System Design and Related Services.

Use of the term 'firm'

The term 'firm' is used generically. It includes all relevant entities, some of which are not firms at all, such as those in the charities, government, education and health sectors.

Example firms

This report provides examples of firms which are believed to belong to the sector. The example firms provide a partial answer to a key question on the composition of a sector: which firms are in it?

Firms are classified by Statistics New Zealand as being part of an industry sector according to their predominant activity. This is explained fully on the Statistics New Zealand website. The classification of each firm to a sector using the Australian and New Zealand Standard Industrial Classification (ANZSIC) system is confidential to Statistics New Zealand.

Because of the confidentiality rules, the Ministry of Business, Innovation and Employment has used other publicly available sources to determine which firms are likely to belong to a sector. These sources may be inaccurate or incomplete.

Quotes and interviews

A limited number of interviews with sector leaders were carried out in the preparation of this report. Anonymous quotes from these interviews that illustrate key themes have been included. The opinions expressed are those of the industry participants. Additional quotes from public sources have also been used.

A full explanation of the data sources and limitations is provided online at www.mbie.govt.nz.

The Ministry of Business, Innovation and Employment (MBIE) welcomes comment and feedback on this report.
Email: sectors.reports@mbie.govt.nz