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Baseline understandings of Queenstown-Lakes' existing tech sector

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2. Background to this report

This report has been prepared for Whakatipu Hangarau by Benje Patterson Economics.

The report is designed to give a baseline understanding of what we know about the current contribution of Queenstown-Lakes' tech sector to the local economy and how it has been growing over recent years.

Information in this report has been sourced from Infometrics, with the sponsorship of Queenstown Lakes District Council. To supplement the analysis of Infometrics data, the report also identifies gaps and limitations of the datasets. The idea is to help guide Whakatipu Hangarau's early engagement with stakeholders, and to inform what additional supplementary information should be investigated to deepen understandings of the local tech sector.

2.1 Tech sector definition

The tech sector definition used in this report is the definition developed by the Ministry of Business, Innovation and Employment (MBIE)[1]. MBIE's tech sector definition captures a broad spectrum of the information and communications technology (ICT) sector (including services, design, manufacturing, and wholesaling elements), alongside high tech and biotech manufacturing. The ANZSIC industry codes used in the definition, and example firms from around New Zealand are in the diagram below.

Statistical Definition of Sector

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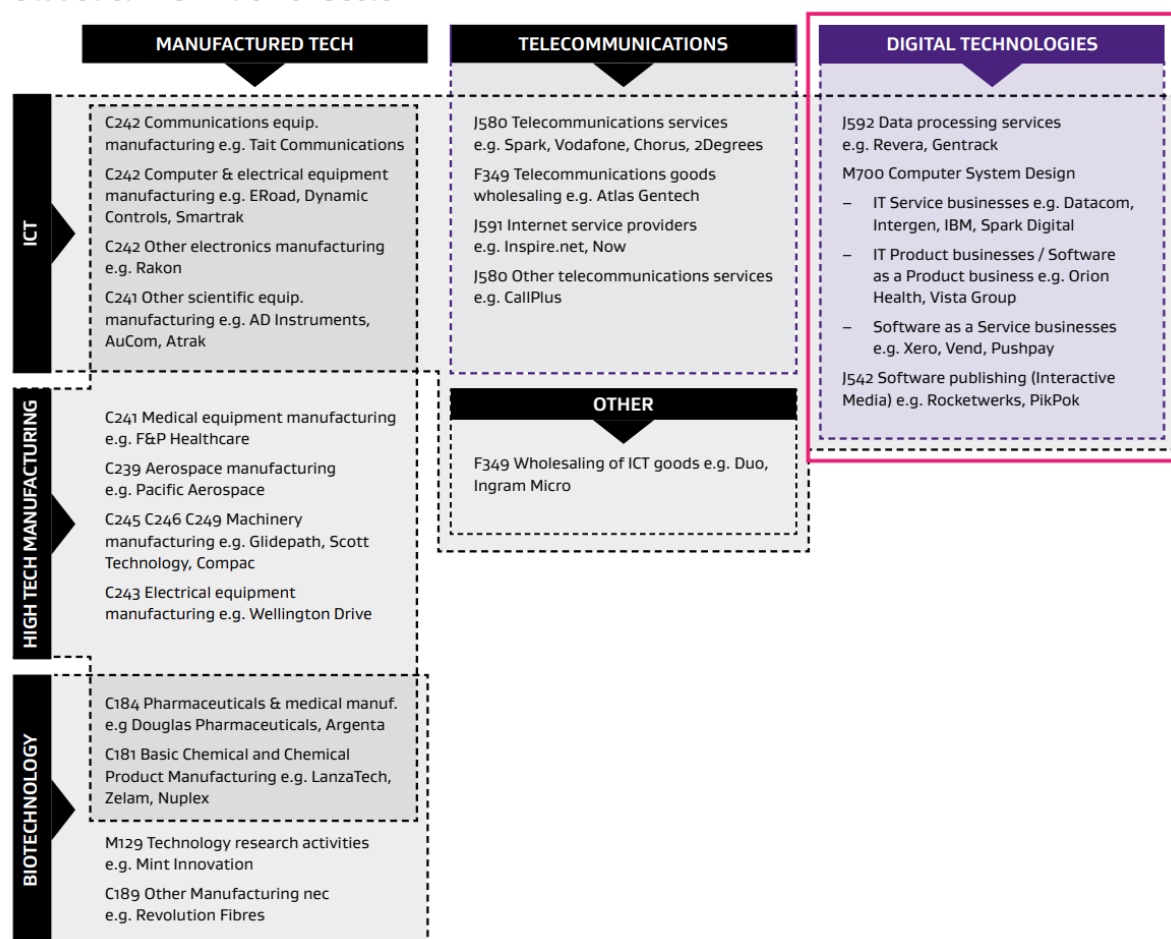
[1] See MBIE's Digital Technologies Industry Transformation Plan 2022-2032, and the Investor's Guide to the New Zealand Technology Sector (2019).

3. Baseline understandings of Queenstown-Lakes' existing tech sector

Data sources from Infometrics gives us a number of baseline understandings about the existing size and growth of Queenstown-Lakes tech sector. These understandings focus on:

- Business numbers
- Employment
- Contribution to economic activity
- Productivity.

Infometrics models this information by drawing on a variety of government datasets, including: Business Demography, Linked Employer Employee Data, Census, and regional/national GDP. Data is for March years.

3.1 Business numbers in Queenstown-Lakes' tech sector

There were 171 businesses in Queenstown-Lakes' tech sector in 2021.

These tech businesses accounted for a 1.9% share of the 9,213 businesses that existed across all sectors in Queenstown-Lakes.

Figure 1 – Tech business numbers in Queenstown-Lakes, source: Infometrics

171 businesses in Queenstown-Lakes' tech sector

1.9% of all businesses in Queenstown-Lakes are in the tech sector

By comparison, nationally there were 23,601 tech sector businesses in 2021, representing a 3.9% share of all businesses in New Zealand. Across Otago there were 702 tech businesses, which represented a 2.3% share of all businesses in Otago

The number of tech businesses in Queenstown-Lakes has risen from 114 in 2011 to 171 in 2021. The growth rate in tech businesses has generally been faster over the long-term than business numbers across Queenstown-Lakes' economy as a whole. Growth in the number of tech businesses in Queenstown-Lakes has averaged 4.4%pa over the past decade, compared to 3.8%pa average growth in the number of businesses across all sectors in Queenstown-Lakes.

Although the 2021 estimate shows a slight decline in tech businesses, it is important to point out that the 2021 estimate is to March 2021 rather than for the calendar year. As such, the estimate only captures what unfolded in the first year of the pandemic, rather than trends in local tech entrepreneurship that may have emerged more recently once the initial period of uncertainty was behind us.

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Table 1 – Growth in the number of tech businesses in Queenstown-Lakes, source: Infometrics

Growth in business units, source: Infometrics				
	Tech sector		Total Queenstown-Lakes	
	Businesses	% change	Businesses	% change
2011	114		6,333	
2012	126	10.5%	6,414	1.3%
2013	126	0.0%	6,525	1.7%
2014	132	4.8%	6,873	5.3%
2015	150	13.6%	7,215	5.0%
2016	165	10.0%	7,638	5.9%
2017	162	-1.8%	8,043	5.3%
2018	168	3.7%	8,346	3.8%
2019	192	14.3%	8,775	5.1%
2020	174	-9.4%	9,144	4.2%
2021	171	-1.7%	9,213	0.8%

3.2 Employment in Queenstown-Lakes' tech sector

There were 544 jobs in Queenstown-Lakes' tech sector in 2021.

These tech sector jobs accounted for a 1.9% share of the 28,832 jobs that existed across all sectors in Queenstown-Lakes.

Figure 2 – Employment in the tech sector in Queenstown-Lakes, source: Infometrics

544 jobs are in the Queenstown-Lakes' tech sector

1.9% of all jobs in Queenstown-Lakes are in the tech sector
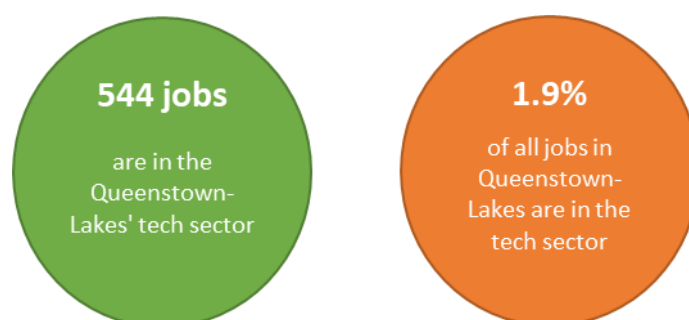
By comparison, nationally there were 136,090 tech jobs in 2021, representing a 5.2% share of all jobs in New Zealand. Across Otago there were 2,990 tech jobs, which represented a 2.3% share of all employment in Otago.

The number of jobs in the tech sector in Queenstown-Lakes has risen from 296 in 2011 to 544 in 2021. The growth rate in tech sector employment has generally been faster over the long-term than employment growth across Queenstown-Lakes' economy as a whole. Growth in tech sector employment in Queenstown-Lakes averaged 6.5%pa over the past decade, compared to 4.6%pa average growth in employment across the whole Queenstown-Lakes economy.

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Table 2 – Growth in tech sector employment in Queenstown-Lakes, source: Infometrics

Growth in employment, source: Infometrics				
	Tech sector		Total Queenstown-Lakes	
	Employment	% change	Employment	% change
2011	296		18,657	
2012	300	1.4%	18,917	1.4%
2013	353	17.5%	19,499	3.1%
2014	393	11.3%	20,592	5.6%
2015	434	10.5%	22,034	7.0%
2016	495	14.0%	24,231	10.0%
2017	509	3.0%	26,354	8.8%
2018	560	10.0%	28,416	7.8%
2019	557	-0.7%	30,252	6.5%
2020	543	-2.5%	31,522	4.2%
2021	544	0.2%	28,832	-8.5%

3.2.1 Self-employment

Infometrics data shows that tech sector employees are much more likely to be self-employed than other workers in Queenstown-Lakes. In 2021, some 29.9% of tech sector employees in Queenstown-Lakes were self-employed, compared to a self-employment rate of 22.1% across all industries in Queenstown-Lakes.

By comparison:

- 14.7% of tech sector workers nationally are self-employed
- 21.1% of tech sector workers across Otago are self-employed.

3.2.2 Most in demand occupations

Infometrics models the skill levels and occupations that are likely to be in demand by businesses. The Infometrics' modelling considers the relationships between businesses and occupations from Census data and then calculates how occupational demand will change through time. The data should be taken as an indicative assessment of occupational demand, rather than a precise description of occupations as the occupational mix within the tech sector evolves rapidly between censuses.

Infometrics estimated that 54.6% of tech sector jobs in 2021 were in occupations classified as being "high skilled", compared to a 29.9% share across all of Queenstown-Lakes' economy. A high skilled occupation is classified as generally requiring education or skills equivalent to having a bachelor's degree or higher.

Table 3 – Employment by broad skill level, source: Infometrics

Employment demand by skill level (2021), source: Infometrics				
	Tech sector		Total Queenstown-Lakes	
Skill level	Employment	% of total	Employment	% of total
High skilled	297	54.6%	8,624	29.9%
Medium-high	54	9.9%	4,837	16.8%
Medium	94	17.3%	4,737	16.4%
Low	100	18.3%	10,634	36.9%
Total	544	100.0%	28,832	100.0%

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The most in demand occupations according to Infometrics estimates are ICT professionals.

Table 4 – Employment by occupation, source: Infometrics

| Employment demand by occupation (2021), source: Infometrics				
	Tech sector		**Total Queenstown-Lakes**	
Occupation	**Jobs**	**% of total**	**Jobs**	**% of total**
ICT Professionals	117	21.6%	378	1.3%
Specialist Managers	71	13.1%	2,457	8.5%
Automotive & Engineering Trades Workers	67	12.3%	513	1.8%
Design, Engineering, Science Professionals	37	6.9%	1,144	4.0%
Business, HR & Marketing Professionals	35	6.5%	1,096	3.8%
Chief Execs, General Managers, Legislators	27	5.0%	1,042	3.6%
Engineering, ICT & Science Technicians	24	4.5%	445	1.5%
Office Managers & Program Administrators	16	3.0%	672	2.3%
Sales Assistants & Salespersons	14	2.6%	1,756	6.1%
Sales Representatives & Agents	13	2.5%	1,004	3.5%
Other Technicians & Trades Workers	12	2.3%	408	1.4%
Numerical Clerks	11	2.0%	396	1.4%
General Clerical Workers	9	1.7%	405	1.4%
Other Clerical & Administrative Workers	9	1.7%	316	1.1%
Storepersons	8	1.4%	138	0.5%
Hospitality, Retail & Service Managers	8	1.4%	2,013	7.0%
Machine & Stationary Plant Operators	7	1.3%	274	1.0%
Other Labourers	7	1.3%	708	2.5%
Electrotech & Telecoms Trades Workers	6	1.1%	410	1.4%
Factory Process Workers	5	1.0%	234	0.8%
All others (residual)	38	7.0%	13,025	45.2%
Total employment	**544**	**100.0%**	**28,832**	**100.0%**

3.3 Contributions to economic activity (GDP)

Infometrics also calculates the economic activity (GDP) generated by Queenstown-Lakes' tech sector. GDP is a consistent way of capturing the value added to the local economy. GDP should not be confused with revenue – rather GDP can be thought of as the economics equivalent of an accounting profit[2].

According to Infometrics estimate, Queenstown-Lakes' tech sector generated approximately $58.6 million of GDP in 2021, which was equivalent to 1.8% of all GDP in the district.

By comparison, nationally the tech sector generated approximately $23.5 billion of GDP in 2021, representing a 7.2% share of all GDP in New Zealand. Across Otago there was approximately $331 million of GDP generated by the tech sector, which represented a 2.3% share of all GDP in Otago.

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[2] At a firm level, GDP is conceptually equivalent to EBITDA (earnings before interest, taxation, depreciation and amortisation) plus wages and salaries.

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Figure 3 – Tech sector GDP in Queenstown-Lakes, source: Infometrics

$58.6m of GDP

generated by Queenstown-Lakes' tech sector

1.8%

of Queenstown-Lakes' GDP is generated by the tech sector
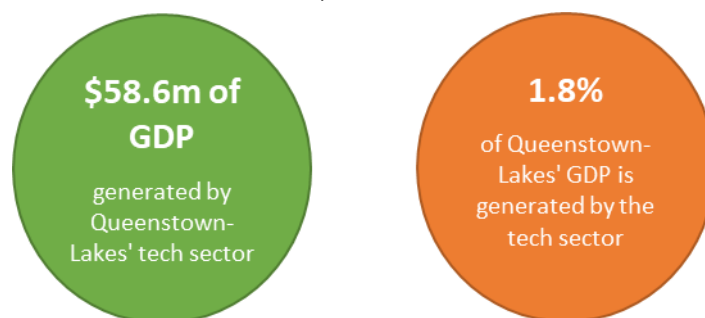
The contribution of the tech sector to GDP in Queenstown-Lakes has risen from $30.5 million in 2011 to $58.6 million in 2021. Growth in tech sector GDP has generally been faster over the long-term than across Queenstown-Lakes' economy as a whole. Growth in tech sector GDP averaged 6.9%pa over the past decade, compared to 5.1%pa average growth in GDP across the total Queenstown-Lakes economy.

Table 5 – Growth in tech sector GDP in Queenstown-Lakes, source: Infometrics

Contribution to GDP, source: Infometrics				
	Tech sector		Total Queenstown-Lakes	
	GDP	% change	GDP	% change
2011	$30.5m		$1,954m	
2012	$30.1m	-1.4%	$2,002m	2.5%
2013	$33.9m	12.5%	$2,087m	4.3%
2014	$37.6m	11.2%	$2,225m	6.6%
2015	$42.5m	12.9%	$2,423m	8.9%
2016	$47.5m	11.9%	$2,698m	11.3%
2017	$50.3m	5.9%	$2,955m	9.5%
2018	$55.6m	10.4%	$3,200m	8.3%
2019	$58.8m	5.8%	$3,429m	7.2%
2020	$58.9m	0.1%	$3,567m	4.0%
2021	$58.6m	-0.5%	$3,169m	-11.2%

3.3.1 Productivity of the tech sector

Productivity of Queenstown-Lakes' tech sector can be estimated using Infometrics data by comparing the GDP generated by the sector against the number of employees within it. Somewhat surprisingly, this comparison shows that Queenstown-Lakes' tech sector generates approximately $107,700 of GDP per job, which is lower than the productivity of $109,900 of GDP per job across the district's entire economy.

But the implied estimate of productivity from Infometrics' data is unlikely to be a true reflection of productivity within Queenstown-Lakes' tech sector. At a national level, estimates from Infometrics suggest tech sector productivity of approximately $172,700 of GDP per job. Business productivity data is notoriously difficult to estimate within specific industries in small geographical areas because of insufficient coverage in Statistics New Zealand's models of regional economic activity. The tech sector is particularly susceptible to inaccuracies when modelling productivity because margins vary markedly between different types of tech businesses. For example, the average return on equity for large software developers in New Zealand was 40% in 2020, compared to 6% for medium-sized IT wholesalers[3].

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[3] Source: Statistics New Zealand's Business Performance Benchmarker, tool used on 28/06/22.

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4. Gaps in our understanding of the local tech sector

The following table highlights some of the gaps and limitations we have in our quantitative understandings of Queenstown-Lakes' tech sector. The list should be taken as an initial starting point, rather than an exhaustive stocktake of all gaps. It can be further deepened by consulting with stakeholders and other industry experts.

Gaps pertain to shortcomings in the existing indicators we have sourced from Infometrics, as well as a lack of coverage regarding the specifics of how businesses operate and what their balance sheets look like. There are also gaps that emerge regarding our awareness of the skills demand and the talent pipeline, and a stocktake of broader assets, infrastructure, and services which are critical enablers to the local tech sector. An awareness of these gaps may help inform engagement by Whakatipu Hangarau with stakeholders and may influence steps taken to measure the impacts of actions taken.

Table 6 – Gaps in our understanding of the local tech sector

Gap	How would filling this gap help?
Tech sector productivity	Tech sector productivity is too bluntly captured in the current data. More accurate profiling of the operations and revenue generated by tech businesses would deepen understandings of how productive Queenstown-Lakes' tech businesses are. This profiling would deepen knowledge of product/service niches for the local tech sector.
Exports and sources of revenue	We do not know which markets local tech businesses generate revenue from. A better understanding of sources of revenue could help with understanding business development needs and to better access NZTE services.
Balance sheets and sources of capital	Many tech businesses don't generate a lot of revenue in their early days, but capital raisings and exits by founders can unlock large amounts of capital. Economic models (eg. GDP) focus on income, but changes in asset prices are just as important for factoring in the wealth and opportunities created by the tech sector. Understanding how much capital is attracted to the sector, and how it is recycled into future ventures would provide a more rounded representation of value generated by the tech sector.
Research and development	Research and development can lead to the creation of IP that takes a while to pay dividends, and the benefits of breakthroughs can also spark changes where value spills over into other areas. Measurement of R&D activity within the local area will help with benchmarking against best practice globally in the tech sector and to inform conversations with funders of innovation, such as Callaghan Innovation.
Remote work	Current data captures people who work for local businesses or are self-employed. But there are a cohort of residents who work remotely for employers based elsewhere – we need to understand how many people are in this cohort, what skills they have, and what factors could encourage them to provide their skills to local tech businesses.
Workforce demand and supply	There is a need to deepen the understandings of the skills, experience and occupations most in demand by employers, the demographics of businesses' current workforce, and how they access talent. Understanding local workforce supply and demand is necessary to design and target actions to deepen the local talent pool.
Broader supply chain/ ecosystem	There are businesses and institutions who aren't a 'tech' firm, but that feed into the supply chain or support the broader tech ecosystem. A mapping of the ecosystem would raise awareness of other businesses and institutions necessary for the sector. Some 'tech' firms are also not adequately captured within official industry definitions.
Supporting infrastructure and assets	Tech sector scale and productivity relies on business being able to access the right businesses premises, as well as being supported by appropriate physical and digital infrastructure. Social infrastructure and other assets, such as community facilities and the type of housing available to workers, also matter to tech businesses when they want to attract and retain a workforce. A stocktake of the relevant supporting assets and infrastructure would help better understand what investments might help the tech sector have the capacity to grow and be productive.

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