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## **Future of Work in Defence**

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## **Part 1 – Future of Work**

## 1. Introduction

There is a significant body of literature on the “Future of Work”, emanating from academia, policy-makers, political parties, unions, and international organisations. The literature covers a wide range of themes, many of which are focused on the impact of technology on jobs. Though the literature is continually increasing in volume, there remain gaps in the literature with regard to demography, the impact of climate change (sometime referred to as ‘just transition’), and income disparity as a consequence of the disaggregation of the workforce. Key themes include what the future of work might look like and, for some researchers, how best to shape or influence change for the benefit of society as a whole. From a macro-economic perspective, there are a number of drivers of change which are coming into sharper focus. These drivers will influence the future of work but their impact and influence will likely remain debatable for some time. Indeed, the International Labour Organisation (ILO) Research Department Working Paper No. 29, *The Future of Work: A Literature Review* states ‘...there exists no universally accepted definition of what exactly the “Future of Work” encompasses and what the most relevant drivers are.’ The ILO paper is a meta-analysis of 255 studies and is focused on the different drivers that will impact the future of work.<sup>1</sup> Insight into what the most relevant drivers are is critical to an informed discussion on the impacts at both a macro- and micro-economic level for nations, organisations, and workers. Ideas about what could usefully be done to ameliorate the negative effects of the anticipated change and better prepare workers for future opportunities, where they exist, is a key theme in the literature. This is particularly so for practitioners.

## 2. Work in Society

Developments in the world of work matter because of the centrality of work, in all its forms, to the economic, security and social life of nations. Work is a core element of society. What makes the future of work important for researchers is the fact that work lies at the nexus of politics, economics, justice, social change, equity, and security. In the absence of a generally agreed definition of the future of work and a broad consensus on what the key drivers of change are, the debate has shifted to the influence of technology, robotics, artificial intelligence (AI), and automation on labour markets and workers. While the literature on the drivers of change is well argued and comprehensive, the second- and third-order consequences of change on society and workers is less well developed. For example, some researchers have argued that proliferation of robotics and automation will lead to

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<sup>1</sup> The authors categorise the literature into: number of jobs, job quality, social protection, wage and income inequalities, and social dialogue and industrial relations.

net job losses as these technologies offset labour.<sup>2</sup> Similarly, other researchers have argued that ‘job polarisation’ will occur where routine administrative jobs will be replaced by robotics and automation, essentially resulting in a two-track labour force.<sup>3</sup> Socio-economic drivers such as demographics and geopolitics are at least as important as technology, though are harder to address.<sup>4</sup> As noted above, the literature on these topics is less well developed leading to an imbalance in the debate and less clarity about what matters. Why is this? An examination of interests may be useful. Politicians seek a robust and diversified economy. Unions seek social justice, equity, and high-quality work for their members, justice advocates seek a robust regulatory environment, and social justice activists seek universal access to opportunities and a fair distribution of wealth in a society. What matters, therefore, is a multi-causal analysis of a disparate and varied set of drivers, some of which are more important than others. Businesses are aware of the potential for change, with 85 per cent of New Zealand chief executives recently highlighting technological advances as the single factor with the greatest impact on business in the next five years.<sup>5</sup> To some extent, researchers do not need a definitive answer, but the lack of clarity has the downside risk of focusing on what might *appear* to be the cause or consequence rather than what *actually is* the cause or consequence. What is becoming increasingly clear, though, is that the nature and scope of work is changing and nations must adapt before the full effects of change are thrust upon them, and the resultant responses (eg, policy, regulation and legislation) are more limited and potentially less effective.

### 3. Change and Adaptation

Change has two dimensions: speed and scale. (Referring to Covid-19) a recent McKinsey & Company article reported a significant acceleration in the use of technology, digitization, and new forms of working.<sup>6</sup> It is the speed and scale of change combined that is most challenging – particularly for governments. The pace of change, estimated by McKinsey’s is ten times that of the Industrial Revolution at 300 times the scale.<sup>7</sup> It takes considerable time to research, seek political consensus,

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<sup>2</sup> Frey and Osborne (2013); Arntz, Gregory, and Zierahn (2016); and McKinsey Global Institute (2016); Decanio (2016).

<sup>3</sup> OECD (2016); German Ministry of Labour and Social Affairs (2016); World Economic Forum (2016); World Bank and International Monetary Fund (2016).

<sup>4</sup> For example, the world population is predicted to grow from 7.349 billion in 2015 to 9.725 billion in 2050 and up to 11.213 billion by 2100. United Nations (2015).

<sup>5</sup> PWC. February 2016, 19<sup>th</sup> Annual Global CEO Survey: Key Findings for New Zealand.

<sup>6</sup> “How Covid-19 has pushed companies over the technology tipping point – and transformed business forever: McKinsey Global Survey results,” October 2020, McKinsey.com.

<sup>7</sup> Manyika et. al., May 2013. Disruptive Technologies: Advances that will Transform Life, business, and the Global Economy.

and initiate change in a democratic society. The causes for which a policy change or regulatory intervention were originally designed to address can be, and often are, overtaken by events in a fast-changing world where the workforce has to adapt to the requirements of automation, digitisation, and technology at speed. Old operating models are being rejected and new ones introduced based on automation, data and the high capacity information systems needed to leverage the explosion of information available. These systems have driven the rise of 'shared services' operating models which at their core require greater processing power, data centres to store more information, and better protective security and cyber security measures to ensure the privacy of the information that they contain is assured, both physically and electronically.

#### **4. Investing in Science and Technology**

There is a critical role for science, innovation and research to harness the benefits of technology for the future of work. In New Zealand, the Government's investment in the Crown Research Institutes underpins the science and technology sector and this must be prioritised if the benefits of a high-wage, technology-driven economy are to be realised. This requires persistence, foresight and a commitment to fund research, particularly primary research, in collaboration with businesses and universities. Collaboration, developing communities of practice, and international engagement will be the cost of delivering a robust, diversified economy in the decades ahead. A knowledge-driven and adaptive economy requires changes in the education system to embed digital technology into human-centred learning.<sup>8</sup> New Zealand's economy is no longer bounded by its borders. Equally, it is not protected by its borders. Part of the response to the changing nature of work is ensuring intellectual property and knowledge-based capital are retained and revenues accrue to the lawful owner. A US Federal Reserve study shows a massive growth in knowledge-based capital (eg, intellectual property, software, data, R&D, and brands).<sup>9</sup>

Technology drives long-run productivity and growth.<sup>10</sup> As previously referenced, predictions that technology will inevitably replace jobs does not reflect historical experience. Technology can make factors of production cheaper (allowing labour to be redirected), it can increase productivity (through

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<sup>8</sup> The Future of Work. Report on the Future of Work Commission, New Zealand Labour Party, 2016.

<sup>9</sup> Corrado, Hulten and Sichel. April 2006. Intangible Capital and Economic Growth. Quoted in SAEI:DES Discussion Document, June 2016.

<sup>10</sup> New Zealand Productivity Commission. March 2020. [www.productivity.govt.nz/inquiries/technology-and-the-future-of-work/](http://www.productivity.govt.nz/inquiries/technology-and-the-future-of-work/).

automation), and it can reduce the price of finished goods (through more efficient use of inputs). It can also displace dirty, dull and dangerous work which has long-run health, safety and wellbeing benefits. But it cannot entirely replace high cognition tasks, tasks with a strong creativity and innovation element, and the increasingly important requirement to collaborate, seek consensus through engagement, and develop culturally-relevant responses to workplace opportunities. The necessity to invest in science and technology, and embrace technology is consistent with developing a robust, resilient economy and an equally resilient workforce. That then requires students' core skills in numeracy and literacy to improve relative to OECD partners, a dynamic business environment, a willingness to embrace the social and economic benefits of technology, policy settings to incentivise the uptake of technology, and immigration policy settings that encourage the free flow of labour across borders.<sup>11</sup>

## 5. Causes and Consequences

The consequences of these trends, for many workers, can be disadvantageous but they also present opportunities to fill skills shortages in digital technology and systems, green technologies and services, and in education. Countries such as New Zealand do not want to be a passive recipient of change thrust upon society, but rather have the ability to adapt to change and adjust to new realities through foresight, varying policy settings ahead of time, and anticipation of the generally accepted trends as these trends come into sharper focus.

In terms of demographics, there are two key metrics to consider:

1. The fall in the working-age population in OECD countries. The working-age population is the proportion of people in the age range 15-64 years. The decline is due to young people joining the workforce later, most often as a result of tertiary study.
2. The rise in the dependency ratio. The dependency ratio is the proportion of people in the age range 0-14 and 65+ who are supported by the working-age population. The key driver here is the aging of the population in the OECD countries.

## 6. Globalisation

International labour migration (or globalisation) can be beneficial provided that workers' rights are preserved and societies avoid creating low-wage migrant communities, often dislocated from the

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<sup>11</sup> Productivity Commission. March 2020.

rest of society because of economic hardship, who effectively do work that local people find unappealing, uneconomic or lack the necessary skills to perform. Globalisation in this context is the free movement of people in search of work. Examples include categories of work which are highly specialised and transferable across borders (eg, software engineers). Since the early 1990s firms have been run to maximise efficiencies, seeking comparative advantage through low input costs. Firms have sought to specialise and concentrate particular work tasks in locations that offer either economies of scale, relatively low wages or conditions of employment, or to offset other business costs such as higher climate change commitments or a more stringent workplace health and safety regulatory environment. In New Zealand, the migrant labour force is substantial, with over 200,000 workers holding temporary work visas. This is a 76 per cent increase over the past five years, demonstrating a significant reliance on migrant workers to drive economic growth.<sup>12</sup>

## 7. Affect on Jobs

There is a significant divergence in the literature about the threat of technological unemployment, or the loss of jobs due to technology. Frey and Osborne (2013), for example, argue that nearly half of jobs are under threat from automation in the next 10-15 years.<sup>13</sup> The countervailing view is that not whole jobs but parts of jobs will be impacted, with some industries more affected than others. It is at the level of sub-tasks and discrete activities within jobs that presents a potential gap in the literature. Most authors agree that discrete tasks within jobs may be surpassed by automation, but not the roles themselves.<sup>14</sup> In New Zealand, this could be as low as 8 per cent.<sup>15</sup> Conversely, technology is less likely to be impactful in roles where collaboration, creativity, and imagination are valued attributes or core requirements of jobs. Examples include child care, elder care, and education where automation is likely to be less pronounced.<sup>16</sup> The information collection and processing capabilities of digital technologies does provide opportunities, potentially to reorientate workers into more self-actualising aspects of their work. Educational reform, vocational training and the encouragement of lifelong learning are also key themes in the literature.<sup>17</sup> The likely scenario is

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<sup>12</sup> Ministry of Business, Innovation and Employment. Briefing to the Incoming Minister of Immigration, November 2020.

<sup>13</sup> Frey, C.B., and Osborne, M.A., *The Future of Employment: How Susceptible are Jobs to Computerisation*, Oxford Martin School, University of Oxford, 2013.

<sup>14</sup> McKinsey (2015) estimates that automation could replace 45 per cent of activities currently undertaken by humans, but only 5 per cent of full jobs could be totally substituted by technology.

<sup>15</sup> Coats, D. Speech to the Future of Work Seminar, Wellington, New Zealand, August 2016.

<sup>16</sup> Finkel (2017).

<sup>17</sup> New Zealand is currently undergoing its own Review of Vocational Education (RoVE), which is a generational transformation of workplace learning.



people-centred approaches augmented by relevant technology as opposed to technology solutions with people as an adjunct. Though subtle, this difference is profound.

## **8. Disaggregation of the Workforce**

In non-standard forms of employment (NFE) New Zealand is likely to see the largest changes. These include temporary employment, part-time work, short-term work, self-employment and contracting. This will result in a greater disaggregation of the workforce, potentially less beneficial terms and conditions for workers, and a reduction in job security. The benefits for employers are access to discrete (often costly) skills as and when they need them, resulting in a theoretically lower cost workforce. The downside risks of NFE include a non-committed workforce, a workforce which does not connect with the organisation's core values, and a changing (and potentially greater) demand placed on managers who are responsible for managing the disaggregated workforce, often with workers with individual terms, conditions and remuneration arrangements. Most authors argue that a long-term, committed workforce which is characterised by positive relationships between and amongst the various stakeholders will produce long-run competitive advantage for firms, and also for workers.

## **9. The 'Gig' Economy**

The rise in the platform or 'Gig' economy is anticipated to contribute to growth in self-employment and the further disaggregation of the workforce. In the United States, for instance, up to 40 per cent of work is performed by freelancers.<sup>18</sup> Many workers perform services via online applications. Workers are not considered employees of the firms who assign the tasks.<sup>19</sup> Authors debate the extent to which the Gig economy is reaching its peak, however the effects of Covid-19 will likely influence this debate for some time as countries go in and out of lockdown and economies rebuild post-Covid-19.<sup>20</sup> The global affects of the pandemic are likely to accelerate the Gig economy as workers become dislocated from their primary place of work and organisations restructure to respond to the new economic realities. What this means for productivity and workers' rights is not yet clear. What is becoming increasingly clear, however, is that workers' rights are weakened through disaggregation of the workforce, and the relationship between workers and their employers

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<sup>18</sup> Estevadeordal (2017).

<sup>19</sup> Stefano and Valerio (2015); ILO (2017).

<sup>20</sup> Key impacts being: i) reduced movement between jobs, ii) reduced opportunities to find better work, and iii) higher unemployment as a consequence of economic shocks. (See Productivity Commission, March 2020.)

is becoming increasingly contractual because (for those in the Gig economy) the work supplied is often generic, delivered via an online platform, and dislocated from the 'place' and 'purpose' of the firm which has contracted for the work. Other considerations include the potential for discrimination, the disappearance of a fixed, physical location or 'place of work' (work being essentially a social interaction), and weak disputes resolution regulations and practices. The result is workers being at arms' length from employers which can result in inequities and discrimination. As the ILO points out the Gig economy represents a number of significant downside risks associated with work-life balance, merit-based access to career development opportunities, social protection, workplace health and safety, and hours worked. There is also an increasing body of literature concerning the psychosocial and psycho-social risks which include social isolation, lack of task clarity, lack of supervision and leadership, and displacement from the people-to-people networks that often enable the effective delivery of agreed work tasks or outcomes in the workplace.<sup>21</sup>

## **10. Industrial Relations and Advocacy**

Future of work consequences on Industrial Relations (IR) and advocacy are also key considerations in the literature. Recent trends as a consequence of labour market deregulation have weakened the impact and influence of unions and organised labour. Some researchers discuss the fact that unions should reorientate to be able to effectively represent workers in the Gig economy, noting that some of these workers (in their view) don't seek advocacy. These authors argue that advocating for workers' in the Gig economy or, in the case of contractors, the contracted worker is needed now more than ever. Reaching out to workers who are seeking representation, advocacy and protection will be key for organised labour groups in future. This is a significant change from the previous operating model whereby union organisers worked with (and sometimes within) firms in a structured and organised way. In the most constructive examples, effective dialogue occurs continuously between unions, their members, and their employers. New Zealand, for example, has one of the lowest rates of union membership and collective employment agreement coverage in the OECD.<sup>22</sup> This is concerning in that there is congruence with low rates of union membership in New Zealand and low productivity.<sup>23</sup>

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<sup>21</sup> Boden, Spieler, and Wagner (2016).

<sup>22</sup> OECD. 9 February 2015. Economic Policy Reforms 2015: Coverage rates of collective bargaining agreements and trade union density rates.

<sup>23</sup> Average hours' worked per worker per week and average cost per hour worked.

## 11. Social Protection

Social protection and the welfare state are expected to be challenged in the future. Social protection right now is hinged to full-time (and sometimes part-time) employment characterised by worker and employer contributions. In the Gig economy this relationship ceases to exist, with the obligation on the contractor to make social protection provisions for themselves. Aging populations will require superannuation to fund a longer retirement and potentially a longer period in elder care than was the case for previous generations. Low-interest rate environments create the added pressure that funds accumulated during employment no longer appreciate at the rate necessary to fund workers' retirement. For OECD countries, the aging population combined with the fall in the working-age population and the rise in the dependency ratio creates a challenging political and economic scenario which previous generations have not had to contend with. The politicisation of the superannuation debate compounds the problem for politicians who may recognise the case for change rationally but can't act politically because of a lack of political consensus.

## 12. Informal Sector

As the nature of work changes, it is important to consider what 'work' actually is, because the context varies between cultures and even within a culture. Informal and unpaid work is increasing in importance, and many authors point to the need to acknowledge and value the informal sector and its important place in society and the economy. The informal sector is often a springboard to paid employment through the provision of skills, experience, and a work-ready mindset, and estimates put the number of workers in the informal sector at 2 billion. This figure is heavily skewed towards women and minorities. The informal or 'grey' economy is that part of the economy which is neither taxed, monitored nor regulated by any form of government. It makes up a significant proportion of the economy in developing countries, and significantly less so in developed countries.<sup>24</sup> It is also a category of work that is disproportionately resourced by women and young people, increasing the likelihood for exploitation and discrimination. The social protections in the informal sector are limited to non-existent, and often the work is undervalued or invisible. According to the ILO more than 60 per cent of the world's employed earn their livelihood in the informal sector. The ILO has made formalisation of the informal economy one of its strategic outcomes, with clear links to the

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<sup>24</sup> Definition attributed to W. Arthur Lewis, used to describe employment or livelihood generation primarily within the developing world.

UN's 2030 Agenda for Sustainable Development.<sup>25</sup> In New Zealand there is an increasing voice advocating for workers in the informal sector, driven by a desire to address the gender pay gap and to progress pay equity claims in employment categories traditionally dominated by women and minorities.

### 13. Just Transition

The ILO's 'Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All' (2015) summarised the opportunities and challenges succinctly:

Opportunities:

1. Net gains in total employment as a result of investments in environmentally sustainable production;
2. Improvements in job quality as a result of greener products and services; and
3. Social inclusion as a result of investments in clean, renewable energy.

Challenges:

1. Economic restructuring;
2. Adaption to climate change; and
3. Adverse effects on the incomes for poor households from higher energy and commodity prices.<sup>26</sup>

Just transition is a balancing act, centred around preparing industries for a greener future in sufficient time to limit the impact on workers and communities. Meeting the Paris Agreement goals from an economic or industrial base underpinned by non-renewable energy sources (for example, New Zealand's dairy industry) is not possible. Therefore, it will take time to transition the industrial base of countries to renewable energy sources, and even new revenue streams based on redefining industries (for example, New Zealand's tourism and primary industries). This will impact workers but time and collaboration between stakeholders can limit the worst effects of change on the factor of production that matters most, the people. The process of redefining and reorientating industries is multifaceted and complex. Most economies are iteratively optimised for the comparative advantages that they possess, making it difficult to transition from one source of revenue to

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<sup>25</sup> Women and Men in the Informal Economy: A Statistical Picture, 3<sup>rd</sup> Edition, 2028. International Labour Office, Geneva.

<sup>26</sup> ILO, Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All, 2015.

another. Ultimately, this change will take time and for developing nations it may take incentives, counterbalances, reimbursements and other economic stimuli to help catalyse the change.

#### **14. Gaps in the Literature**

While the literature is growing, there are identified gaps in it. The focus on technology as the primary driver is over represented in the literature. Studies on the impact of technology on jobs and workers are the cause of significant debate in the literature, with projections decades out likely to be most at risk of inaccuracy. The impact of Covid-19 is not yet represented in the literature, but will likely feature strongly in future as firms become disaggregated of necessity rather than by choice. McKinsey and others, while writing on the impact of the pandemic, are perhaps overplaying the effects due to researching the topic so early on in the crisis when the true impact is as yet unknown. There are gaps in terms of climate change and the upside benefits of reorienting to a greener economy. For New Zealand, there is also the benefit of a post-Covid-19 reorientation to greener tourism, potentially driving a higher spend per visitor as opposed to a focus on the mass market (which is in turn a consequence of low cost airfares). The literature on demographics is also under represented. The data could have a greater influence on the future of work than previously thought, both positive (elder care) and negative (rise in the dependency ratio). Lastly, there is a gap in terms of social protection for workers, and the impact of a disaggregated workforce on societies that value traditional forms of work or for whom few viable options exist to transition to.

## **Part 2 – Impact on Defence**

**Why do new and emergent military capabilities challenge current people capability operating models in the New Zealand Defence Force?**

## **15. Introduction**

Throughout history nations have developed military capabilities in response to threats, occasionally intangible but more often existential, physical and tangible. Maritime, land and air capabilities comprised the physical means of nations to pursue political objectives in the national interest. As a consequence, nations invested in military capabilities through organisations and structures that supported and underpinned both the capabilities themselves and the domains or environments within which conflict ensued. In general terms, the domains or environments (maritime, land and air) resulted in semi-autonomous navies, armies and air forces from which military capabilities derived and forces deployed. Capabilities varied according to a nation's strategic circumstances, sense of perceived or actual threat, and available resources. The ability to conduct operations in the maritime, land and air domains within the framework of collective security arrangements and directed towards securing the national interest was the primary objective of militaries, large and small.

Post the Second World War, the single Service organisations gradually became more joined up and 'joint' in nature and an organisational layer above the single Services was established to direct capability development and force modernisation and to coordinate the activities and resources of the whole enterprise. Organisational development occurred iteratively with key inflection points aligned to political lifecycles or the focus areas and priorities of senior organisational leaders. In the post-9/11 environment, developments occurred often out of necessity due to emergent challenges, for instance as a response to violent extremist organisations (VEOs). The desire to contribute to international stabilisation efforts with partners such as NATO spurred two things: i) capability development, and ii) investment choices designed to address new and emergent threats in the operating environments where forces were deployed. In the 1990s this was the Balkans and Southern Europe and in the first two decades of the 21<sup>st</sup> Century this was Central Asia and the Middle East.

## 16. People Capability Operating Models

As a consequence of the post-War iterative development of militaries set against the relatively stable Cold War scenario of the 1950s to late 1980s, people capability operating models were relatively static and formulaic, designed to provide the fundamental inputs to capabilities in a way that provided a high level of assurance to meet directed outputs or agreed states of operational readiness. These models relied on comparatively stable doctrine (ie, a common frame of reference on how to apply military force), force structure assumptions (ie, scenarios and military response options), technology, organisational structures, and numbers of trained individuals to meet minimum force employment prerequisites. Characteristics of post-War people capability operating models included:

- Recruiting relatively young people in large numbers.
- Training foundation learning first to inculcate core values and core skills.
- Training specialist learning second to establish a technical foundation.
- Training throughout a career in management and leadership competencies.
- Training throughout a career in more advanced specialist competencies, ultimately leading to command, leadership and management roles at successive echelons of command.

The downside of this approach was that it tended to rely heavily on iterative development of capabilities to meet a conventional or narrow world view of where threats would arise. Other states was the predominant frame of reference, sidestepping the emergence of non-state actor and violent extremist organisations. When considering how best to respond to such threats conventional application of military power in a state-on-state conflict was the guiding, though increasingly contestable, assumption. Contestable because the breakdown of nation states in the years immediately after the end of the Cold War gave rise to violent extremist organisations and challenged the efficacy of the rules based international order. Examples include humanitarian interventions in the Balkans in the 1990s (eg, Bosnia-Herzegovina and Kosovo), Sierra Leone and South Sudan in the 1990s and early 2000s, and conflict throughout the Middle East from the early 2000s to the present day.

## 17. Early 21<sup>st</sup> Century

Post 9/11 international stabilisation efforts were comprehensive in nature and broad-based in terms of the coalitions that they comprised and the objectives these coalitions sought to achieve.



Coalitions tended to be led initially by framework nations such as the United States or United Kingdom but relatively quickly were brought under the auspices of NATO, regional groupings of nations, and the UN. Capabilities that had comprised military organisations and were optimised for the late 20<sup>th</sup> Century were re-roled and re-purposed to meet altogether new threats, often in the knowledge that this was likely to be a poor compromise in practice. This in turn gave rise to new capabilities to meet emergent threats, and new thinking about how best to defeat or neutralise threats to national interests and shared values. It provided significant challenges in terms of people capability, and these challenges materialised in the internal labour market within the New Zealand Defence Force (NZDF) and the associated regulatory environment embodied in the Defence Act 1990, the Employment Relations Act 2000, the Armed Forces Discipline Act 1971, the Strategic Defence Policy Statement 2018, the Baseline Review 2019, the Defence Capability Pan 2019, and relevant policies, strategies and plans from the early 2000s onward.

### **18. What are the New and Emergent Capabilities?**

Examples of new and emergent capabilities to meet contemporary threats include: cyber (ie, the ability to protect information systems, networks and data from disruption), processing, exploitation and dissemination of data (ie, translating data into decision support information), aeronautical engineering (ie, composite materials for aerospace applications), space-based systems (ie, for navigation and targeting), robotics (ie, to counter improvised explosive devices), electronic warfare (ie, using the electromagnetic spectrum for military applications), artificial intelligence (ie, processing large amounts data to automate previously manual processes), nanomaterials (ie, for microscopic autonomous systems), and enhanced human performance under operational conditions. While innovation has been a feature of military capability development, the speed and scale of change (referred to in Part 1) that has challenged the regulatory environment.

### **19. Effect on the Regulatory Environment**

To what extent do current operating models rely on steady state or incremental change? This question is fundamental to understanding how a large and complex organisation such as the New Zealand Defence Force acquires the people capabilities necessary to deliver on the government's expectations and political objectives. For example, when confronted by a fast-changing environment (eg, cyber), why does the existing people capability operating model fail to deliver the sustainable workforce needed? What are the range of interventions needed to better prepare the

organisation for future requirements, including the skilled workforce needed to operate these capabilities? Are there structural barriers over and above organisational choices and trade-offs and resourcing considerations that mean that organisational responses are disconnected, poorly aligned and uncoordinated?

## 20. What Was Valued Once?

Traditionally, physical conditioning was highly valued but the new and emergent capabilities do not necessarily require this as a core competence in everyone. In terms of a career, the traditional frame of reference was that both the organisation and the individual sought and valued a long-term, stable career. Certainty was valued by both parties. This allowed capabilities to be developed and instilled over time, leading to a medium- to long-term advantage for the organisation. But the fatal flaw was time. If the refresh rate of emergent capabilities was quicker than the operating model could deliver then the investment in people would count for little. Put another way, the refresh rate of new capabilities does not allow the time for the iterative, step-wise operating model of the past. People potentially attracted to new roles and trades may not necessarily be interested in a longer term engagement in the organisation. In terms of skilling and training, Defence's schools, learning institutions and learning providers are not optimised for fast-changing emergent capabilities, or agile enough to refresh the skills and knowledge underpinning these capabilities. As a consequence, hybrid models are being considered as a possible response to the changing environment.

## 21. Other Factors

In addition, the dominant career model was to value the generalist over the specialist, but for the emergent capabilities discussed above the specialist *was* the capability and the generalist the enabler of it. The imperative to accrue operational experience as the precursor to more and greater responsibility challenged the notion of what was important and, consequently, who was important. Previously, the organisation, its people and the regulatory environment knew who was to be *supported* (ie, frontline capabilities) and who was *supporting* (ie, enabling capabilities). If the roles were to be reversed the system as it exists today would not be optimised for success. A key element of the existing operating model is that civil staff augment core military capabilities, providing permanence and continuity in what can be a very dynamic organisation, despite continuing efforts to create and maintain stability in organisations and functions. But what if some civil staff were the capability and the capacities they represented were the decisive capabilities of the future? There

would likely be Law of Armed Conflict (LOAC) implications and potentially issues around the status of individuals as parties to armed conflict, notwithstanding that people may be physically dislocated from the conflict. Continuing this theme, Reserve Force personnel round-out and top-up Regular Force organisations, particularly in long-term commitments where rotations of units multiple times is needed, often for an indefinite period of time. If this were to be the case in future, then there are implications for force structure, funding, and personnel growth targets set against specific capabilities. The contention of this paper is that capabilities essential for future requirements may not be appropriately supported by the existing system, potentially leading to policy failure.

## 22. Questions for Consideration?

- What if new and emergent capabilities do not require physical skills, but do require high cognition and mental acuity?
- What if a better operating model was shorter, more intensive periods of skilling followed by on-job training and a shorter, more intensive career with incentives to match?
- If the organisation's learning institutions are not agile enough to react to the likely pace of change, how could they adapt?
- What if the specialist *is* the capability and the generalist the enabler? What effect does that have on force structure?
- What if operational service was in New Zealand? What effect does that have on people?
- Are (some) civil staff *the* capability of the future? If so, what roles and functions are required in uniform?
- What if Reserve Force personnel were *the* capability and the Regular Force the round-out and top-up capability? Does that reverse decades of investment in high cost contingency forces for which deployment is unlikely, though not unforeseeable?

## 23. Changing Labour Market Dynamics

As discussed in Part 1 of this paper, a number of factors intensify the preceding contextual discussion about the future of work. The following section addresses the most important changes, with implications for the New Zealand Defence Force.

- **Disaggregation.** The traditional post-War paradigm of full-time, at the workplace, stable employment is becoming significantly less common. The present day New Zealand Defence Force workplace is comprised of full- and part-time civil staff members, contractors,

consultants, full- and part-time military members, cross-agency embedded staff, and international seconded staff.

- **Dynamism.** This factor recognises that different employees are talented and skilled differently and that different people are optimally productive at different times of the day, at different locations, and in different roles. The focus is around delivering on agreed outcomes and not inputs (eg, hours worked), and providing flexibility for people to be their best.
- **Contracting.** The contract relationship is between the contractor and the principal, to perform services under a contract for services or independent contractor agreement. The relationship with the organisation is different and less connected at a philosophical level, though there may be a requirement to adhere to the principles of a code of conduct or similar document. Workplaces such as the New Zealand Defence Force increasingly make use of independent contractors to insource specialist services and to provide short-term surge capability.
- **Globalisation.** Globalisation is the process of organisations expanding offshore to gain access to markets, capital and inputs (skilled labour), and in so doing gain access to resources at a comparatively lower cost. Logistics (ie, the supply chain for products and services) can be sourced from offshore markets creating an economic benefit to the firm. The downside risk is loss of flexibility if markets are disrupted.
- **Technology.** The speed, efficiency, quality and personal experience of work has been largely positively impacted by technology. Many tasks and processes have been enhanced by technology, including bespoke software applications for collaboration, communications and teamwork. ICT-enabled solutions from e-Learning to finance provide greater utility, efficacy, functionality and accuracy. Increasingly, Artificial Intelligence (AI) will be used to replicate basic, repetitive tasks where accuracy and low-variability is valued. Many traditional HR tasks and workflows are expected to be automated, with the hypothesized benefit to firms being better resource utilisation.
- **Changing Demographics.** Changes in the working-age population affect labour participation rates, which in turn have an effect on workplace diversity. The demographic structure of the workforce (ie, aging of the workforce) can have positive and negative impacts. In the New Zealand Defence Force a positive aspect is that many roles can be done by older workers just as effectively, if not more so. A less positive aspect is that the core purpose of a Defence Force – warfighting – requires a generally high level of resilience and mental acuity and this can preclude older workers from participating in certain frontline roles.

## **24. New Regulatory Structures**

The existing regulatory structure discussed in this paper is increasingly coming under pressure. This is because the market for new skills, competencies, characteristics and aptitudes is competitive and those characteristics are in high demand in New Zealand and globally. As a prospective employer, the New Zealand Defence Force must appeal to a broad range of people, project a positive and inclusive culture, have a defined and identifiable value proposition, and be seen to be progressive and forward-looking. Because those with the necessary skills and attributes may not be attracted to a traditional hierarchical organisation, the New Zealand Defence Force must adapt its workplace policies and operating model to reflect contemporary values and be flexible to change. Because it may not be possible to map emergent skillsets to traditional trade models, seeking to iteratively adapt existing policy settings to meet emergent requirements may not work. The New Zealand Defence Force has to attract and retain talent matched to emergent requirements but also exiting requirements, making the task of designing a regulatory environment and operating model extremely challenging.

## **25. Reward Systems**

It can be challenging for the New Zealand Defence Force to meet the market in remuneration terms, particularly for high demand skillsets and competencies for which there are similar roles elsewhere in the domestic economy, and in the global economy. The system of rewards linked to Service and trade model progression is a structural inflexibility which reinforces the existing operating model at the expense of setting the organisation up for the future. Sufficient weighting to the needs of emergent capabilities and the people intrinsic to them must be matched with thought leadership as to what the future regulatory environment should be. Non-remuneration benefits, though significant, may not be as highly valued by those for whom the organisation seeks to attract and retain in future. Therefore, a nuanced understanding of the drivers and motivations of the people for whom the emergent capabilities rely needs to be prioritised. Options for non-traditional reward systems are yet to be fully developed and considered, but are likely to be essential. Existing incentives and rewards systems may be counter-productive to growing the capabilities needed for future success on operations, creating the conditions for policy failure.

## 26. High Demand People

All organisations seek to attract the best people, appropriately aligned to their culture and able to perform the roles and functions to fulfil the core purpose of that organisation. The New Zealand Defence Force faces the additional challenge of training, skilling, developing and educating people who are in high demand elsewhere in the economy, and globally. Additionally, some people have particular skills which are fundamental to delivering operational outputs, and these people cannot be replaced in the short term. Examples include pilots, marine engineers, electronic technicians and medics. Although the framework exists for policy settings to better align organisational needs with scarce talent, in practice the challenges are significant, often resulting in short-term decision-making to address urgent skills shortages. Highly transferable skills are not in themselves new, but a range of mechanisms are needed to ensure talent is retained in the organisation, potentially on altered contractual arrangements to maintain a reserve of latent capability for future contingencies. What binds people to a values-based organisation is a life less ordinary, unique experiences, shared values, and a commitment to service for the benefit of the nation. There are many opportunities inside the organisation, but also outside of it, and people are evaluating these constantly. However, more work needs to be done on developing effective pathways to remain engaged for longer periods. Banking and professional services, the Intelligence Community, utilities, the construction sector, and manufacturing sector all offer something different but none offer the uniqueness of a Service career.

## 27. Conclusion

The future of work has highlighted the fact that the existing pipeline operating model has flaws. This is because the pace of change and the disaggregation of the workforce are counteracting forces on the pipeline operating model, which relies on a relatively static set of conditions and assumptions. Once a capability is built, and sustained over time, the external environment may change and render the capability obsolescent. As a consequence, the organisation has to reframe the strategic balance between capabilities which places demands on the organisation today and presents difficult choices and trade-offs in terms of preparing the organisation for tomorrow. The challenge (referring to Moore's Law) is that change is often exponential and capability development more generally logarithmic, which can result in the people capability requirements of delivering future military outputs being put at risk because of short-term pressures or organisational cultural norms.

The New Zealand Defence Force must recruit, train and sustain a military workforce and anticipate the future workforce requirements 15-20 years ahead. This up-front investment (five years for an infantry soldier and up to 12 years for a pilot) means that at the point at which the workforce is fully effective and optimised it is most at risk of losing the people that exemplify the capabilities of the force. This situation is exacerbated by trends in the future of work that indicate people are attracted to flexibility, autonomy, independence and the ability to learn, and then move on to a new challenge. This dichotomy is a one of the most intractable challenges modern militaries face: is it better to depart from a robust though increasingly outmoded operating model or seek to change the status quo and potentially exacerbate the problem if the benefits of the new operating model cannot be realised? This paper argues that a new operating model is required, one that can adapt to the scale and pace of change in the 21<sup>st</sup> Century. This will necessitate greater flexibility and a willingness to adapt policy settings and the regulatory environment to suit the changing nature of work. Without such change, the New Zealand Defence Force will not be prepared for new and emergent tasks, skills and capacities needed to secure New Zealand's national interests into the future.

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