Submission on:

Technological Change and the Future of Work

June 2019

Introduction

1. Thank you for the opportunity to submit on the Issues Paper for the Productivity Commission's current *Technological Change and the Future of Work* inquiry.

2. The Building and Construction Industry Training Organisation (BCITO) is recognised under the *Industry Training and Apprenticeships Act 1992* as the ITO with responsibility for almost all sectors in the building and construction industry.[1] We work for and on behalf of our 15 trade sectors to establish standards, develop qualifications and associated resources, organise training and assessment, and mentor and support trainees, apprentices and their employers. Notwithstanding proposed changes to the organisation of vocational education and training, the Government has also signalled that we will in the future have a formally recognised role in providing strategic leadership on skills leadership issues for our industry that is stronger than previous versions.

3. The topic of technological change and possible consequent changes to working contexts is very broad, and one where the actual situation will vary immensely from industry to industry, sector to sector, and function to function. While we understand that the Commission's inquiry focuses primarily on 'big picture' commentary and analysis – rather than specific implications for individual industries – our approach is grounded in the experience of the building and construction industry. It is also grounded on those parts of the industry for which we have direct responsibility; what might be termed the 'craft' or 'trade' side of the industry.

General Comments

4. As noted above, 'the implications for work of technological change' is a very broad area for the commission to explore. Changes and impacts are likely to be felt unevenly across industries, and we note that there can be a tendency to overstate – both positively and negatively – the 'disruptive' nature of technology. For example, as the issues paper acknowledges, Frey & Osborne's (2013) work is deeply problematic for identifying the effects of technology on the workforce as it involves no empirical analysis of actual labour trends, patterns of automation, or drivers for investing in technological development. And yet that has not stopped their headline '47% of jobs may soon be automated' figure being cited across a range of contexts for a range of purposes.

[1] The main occupations and sectors outside our remit are scaffolding, electricians, plumbing, gasfitting & drainlaying, and roofing.

5. In terms of the possible future scenarios put forward by the Commission, we see the most likely outcome for New Zealand as being an uneven mixture of all four, with each being represented to different degrees not just in different sectors of the economy, but within different industries and potentially different regions. In practice, this will likely smooth out to a fundamentally 'Steady As' scenario for the economy as a whole. We also note that the scenarios laid out in the issues paper invovle some significant assumptions. For example, the 'Steady As' scenario involves not only assuming that current rates of technology adoption remain the same, but also that there will be no changes to productivity or the number of jobs in the economy due to other factors. There is no scenario under which the Commission envisages the rate of technological adoption remaining the same, but productivity increasing (for example, through economic stimulus, the greater adoption of high-performance work measures, or the effects of increased investment in skills) – or indeed, a scenario under which technology adoption increases but this does not have an effect on real productivity.

6. Given these points, while we do appreciate the Commission using these scenarios as a way to frame its initial thinking about the topic, we do not see significant value in the eventual conclusions and advice of this inquiry being framed against them. Doing so would simply invite argument about the likelihood of specific scenarios, how they have been constructed, and their applicability to particular sectors or populations. We instead believe it would be best for the Commission to couch its future work in terms of specific aspects or dimensions of the workforce (many of which have been outlined in the issues paper) and the potential positive and negative effects of technology in those areas, rather than trying to force these into the scenario framework.

Technological Change in Building and Construction

7. For the building and construction industry specifically, technological change is a significant concern. Recent consultation with our National Advisory Groups (specialist bodies representing our 15 trade disciplines) found that addressing the impact of technology was their most prominent priority issue. It should be recognised, however, that this broad theme masks difference in perceived importance and relevance between sectors. For some areas addressing the adoption and effects of new technology was seen as critical, while in sectors such as Tiling representatives told us that technological change was unlikely to have dramatic impacts in the short or medium term.

8. In the context of this inquiry, it is also important to note that our industry did not perceive technology as likely to be 'disruptive' in the sense of creating significant changes to the way that the industry operates or the nature and scale of employment relationships. The types of technologies that are on the horizon for building and construction are primarily 'resources': new processes, materials, and tools that have benefits for firm productivity. These include more extensive automated stock management and logistics systems, mobile job planning and tracking methods, process and design technologies such as Building Information Modelling (from Four- to Seven-Dimensional) and Virtual Reality, and – at the more distant end – potential use of robotics (both actual robots and exoskeleton-style technologies). Some of these directly impact on firm activity or organisation, while others are more related to customer service and relationships. For example, in sectors such as Kitchen Installation,

clients are increasingly expecting access to self-design tools and processes that allow for direct personalisation of the products being purchased.

9. These new technologies can have significant effects on firms. For example, one NAG representative noted that the increased size and volumes of products within their industry was making investment in automated machinery and lifting equipment (for stacking and installing) a requirement of being able to do business. Similarly, at the margins some specific roles (e.g. specialist consultants) might be created, and others become less common if fewer people were required for tasks such as inventory management. However, there was little sense during this consultation that these represented fundamental changes to the future of work within the industry. Essentially, the impact of technology will not be to change *who* does work, or *what* they do, but *how* they go about doing it.[2] Using the Commission's framing, we therefore see some form of the 'Steady As' scenario as being the most likely outcome for our industry; technology use will increase, and may even accelerate, but it is unlikely to have a strong impact on approaches to building and construction work and the workforce.

Technological Change and Skill Development

10. While general perceptions are that there will be little direct effect on the building and construction workforce from new technology, there is one key area where such changes will have significant impact: skills requirements and training arrangements. Admittedly, for our industry many of the aspects of this that are identified in Chapter 5 of the issues paper are due to phenomena other than technological change *per se*. For example, the paper raises the role of immigration in the context of addressing skills shortages created by new technology. In the New Zealand context, however, the current reliance on immigration to address building and construction's lack of appropriately skilled staff is not due to technological shifts but simply a rapid increase in demand that cannot be met by the current workforce;[3] our skill shortages are not caused by an issue of *capability*, but one of *capacity*.

11. There are, however, several elements of the skills framework that are linked to technological change. The most obvious of these is an increased need for ongoing training and retraining. Under all four scenarios put forward by the Commission we would expect to see a need to increase overall investment in skills. Under the two 'more tech' scenarios this would be both to offset job loss from automation (which the Commission envisages as occurring even under the 'more jobs' variant) and to take advantage of new technologies being introduced. Conversely, the 'Stagnation' and 'Steady As' scenarios would point to greater investment in order to increase productivity from non-technology sources. We suggest that these second two scenarios in particular would strengthen the case for placing more emphasis on understanding and investing in skill *utilisation* as well as increasing our 'stockpile' of skills. This means not simply putting more people through training programmes, but rather ensuring that firms have a firm grasp on the skills they actually need, and how best to deploy them.

[2] Changes to the workforce are far more likely to seem from changing regulations or business models (such as the dominance of sub-contracting) than they are from new technologies.

[3] Immigration has long been a key characteristic of the industry, to the extent that some have referred to construction as essentially involving a global workforce (Buckley *et al.* 2016).

12. While technological change has always existed,[4] traditionally it has proceeded at a pace that allowed for relatively organic adaption within the building and construction workforce – what one industry representative described to us as "constant but low impact". Indeed many core technologies in the industry have remained largely unchanged for decades (or even centuries), or been replaced by fundamentally similar products such as powered variants or new materials that are treated in relatively similar ways to their antecedents. However, we are now entering a period where industry-relevant technological change is both moving at a more rapid pace and where it is more common for such change to involve less relatively incremental extensions of existing approaches or tools than leaps to something qualitatively different. While this might change in a hypothetical 'Stagnation' scenario, we see this case as unlikely for building and construction. Even a 'Steady As' situation – which we see as most likely for the industry – will actually involve significant evolution in technologies.

13. In these environments, firms cannot rely on relatively informal skill development processes, but will increasingly need access to more formalised training programmes that recognise technological change. Beyond continued investment in lifelong learning, this has several important implications for how we approach education and training that is focused directly on work (i.e. Vocational Education and Training).

14. Firstly, it suggests a stronger role for learning that is tied to and occurs within the workplace. As discussed in our *Building on Solid Foundations* report (BCITO, 2017), a key advantage of workplace-based learning is its authenticity. Rather than focusing on learning principles in the abstract, it focuses on developing skills and capabilities within an applied context that does not simply 'represent' the world of practice but *is* the world of practice. This means that such models are particularly well-placed to address situations where changes to work contexts are rapid and more likely to be unforeseen.

15. Workplace learning is particularly suitable for high-change environments is because while provider-based learning need to be consciously revised to account for such change, making changes to the workplace inherently leads to changes in workplace learning. Rather than a given technology having to be identified for incorporation within a pre-existing curriculum, and relevant programme materials and/or course structures being revised to give effect to this, workplace models lead to such technologies effectively being incorporated into the learning environment as a matter of course. Our framework for education needs to take this into account through funding settings, including avoiding disincentives for organisations to support such models, and exploring ways of assisting firms to support such training.

16. This also needs to be recognised in the nature of how our qualifications are designed. Specifically, on a policy level it suggests that our education system needs to allow for more specialised approaches to learning and for training organisations to be able to offer more focused learning packages – such as funded and recognised microcredentials. Notably, such packages should not be approached as a form of RPL that simply assesses and recognises the capabilities that someone possesses. Rather, these need to be designed as coherent and structured methods of developing skills and capabilities in new areas. Moreover, as part of

[4] Although the construction sector has been identified as one which has been traditionally been affected relatively lightly by technological change (World Economic Forum 2016).

the emphasis on lifelong learning there needs to be clear recognition on a policy level that people's education pathways (and credential accumulation) may not be linear; people may undertake a Level 4 Apprenticeship, and then a microcredential at Level 3, then a Level 6 or Level 7 advanced qualification, and then another Level 3 microcredential.

17. Following on from this, we agree strongly with the issues paper's recognition that strong links between qualification/ programme content and the demands of the workplace are an important element of 'technology-ready' education. We are currently confident in our ability as an ITO to establish and maintain such links, but we agree with the Commission's position that provider-based elements of our vocational education and training system do not have strong connections with industry. In particular, we are concerned at the need for strong micro-level relationships between the direct context for vocational practice and vocational learning, and this has formed a core part of our concern with the proposed Reform of Vocational Education (RoVE) programme (see BCITO, 2019). As noted in our submission on those proposals:

> The current industry training system can be seen as a vertically integrated business model: we develop qualifications (production), make arrangements for training that result in those qualifications (distribution), and manage the direct apprenticeship relationship (retail) … [This] allows us to have industry input at three key levels: our Board (Macro-level), our sector-specific National Advisory Groups (Meso-level), and individual employer and apprentice feedback (Micro-level). This allows for the existence of a feedback loop between individual customers (employers and apprentice) and higher-level functions such as the development of qualifications, strategic planning, workforce development initiatives and the like. Under [the proposed] model, however, that loop would disappear; we would essentially be an industry body that talks to other industry bodies. (15-16)

Careers Education

18. We support the Commission's identification of careers education and capability development as an area to be investigated in this inquiry. We have long argued that the way New Zealand approaches this part of our education system is weak, and to that extent we do not believe that this is an area that would be fundamentally affected by new technology – it has always been an area in need of improvement. However, where we do see a link with the concerns of this inquiry is in how the changing nature of the workforce is reflected in the understanding and advice of career professionals, and the perceptions of people entering our industry.

19. As the technology available in many sectors of the building and construction industry becomes more sophisticated, so the skills that people will need to possess and/ or develop will change, and the nature of the work they do will shift in nature. The growing need for familiarity with CAD (Computer-Aided Design) processes is one example of this; while the

technology itself might have been introduced several decades ago, it is now increasingly being seen as something that a wider section of the workforce needs to be familiar with.[5]

20. This can create problems given careers in trades such as building and construction suffer from a parity of esteem issue, and careers professionals – and other influencers such as families – persist in seeing these occupations as being low or semi-skilled. This can shape whether or not people choose to enter our industries, but it can also affect their expectations of what their work will involve. For example, people who are directed into building and construction without an appreciation of the technological skills that are becoming more commonly desired by employers involved may find themselves in roles for which they are actually a poor fit.

Conclusion

21. Thank you for the opportunity to contribute to this initial stage of the Commission's inquiry; we look forward to the next phase with interest. Please do not hesitate to contact me if you would like to talk about any of the points we have raised

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[5] This represents one aspect of technological change given relatively little emphasis in the report. Change might not involve the introduction of *new* technologies, but their shift from the domain of specialists to a common expectation of most or all staff.