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UP-SKILLING FOR FUTURE WORK

RESPONDING TO SKILLS GAPS IN INVISIBLE WORK

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ABOUT THE AUTHOR

Paul Houghton is the Managing Director of Emergent Form, a Perth-based consultancy focused on information and knowledge in a digital world. An early career in all aspects of information management at the Australian Bureau of Statistics led to a role as Principal Policy Analyst for information policy at the Department of the Premier and Cabinet and the Treasury in the Western Australian government, before becoming Director of Information Services at the Department of Transport. Later Paul became Director of KT Studio, which was established to research the use of technology in knowledge systems. Topics such as e-learning, e-commerce and creative communities were explored with the Western Australian government and others.

Bringing together this experience and an academic background in management, Paul has been able to undertake many projects through Emergent Form which give him a well-grounded understanding of the shifts and changes impacting our economy and society as the digitally enabled future becomes clear.

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FOREWORD

In two reports for the JCIPP's 'Future of Work in a Digital Age' series, Perth-based digital strategist Paul Houghton examines the nature and impacts of digitalisation and the associated acceleration of changes to work across various parts of the economy. In particular, the combination of digitalisation with knowledge and creative work is explored. It is this combination that is now driving growth and changes to industry, government and society – but it is a combination that is still not well understood. In particular, we are still struggling to know how to respond to digitalisation from a skills perspective.

The first report in the series clarified the need to distinguish between digital technology, digitisation and digitalisation, and showed how digital transformation of companies and industries relies on all three. This second report builds on this understanding of digitalisation to identify the best way to tackle skills gaps in the light of the pace and complexity of change, with a particular focus on the relatively neglected area of up-skilling within jobs, as opposed to re-skilling as people change jobs. The reports are a starting point and will hopefully generate more research and discussion, policy analysis and strategic options.

An iterative methodology was adopted that brings together many of the current threads of causes, impacts and strategic options. The project was supported by initial meetings with FutureNow, the Western Australian skills advisory body for the creative, technology and leisure sectors. The project then involved initial desktop research across a number of industry sectors plus interviews with people from the design, freelancer, technology and creative fields like film and television.

The interviewees reinforced the view that they were responding to digitalisation and changing the way they worked, by both drawing on existing skills while continuing to rapidly develop new skills. In many ways they are ahead of the curve. We believe that the lessons to be learned from their experiences can be applied to a broader section of the economy.

To quote William Gibson: 'The future is already here – it's just not evenly distributed'.

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Introduction

There can be no doubt that the very nature of organisations and the ever changing mix of industries in the economy has never moved as fast as it does today. This has an impact on what work is done, who does it and where it happens - all of these factors have changed dramatically in the last few decades as a result of the increasingly abstract nature of the economy and the relentless change brought about by digitalisation.

Report 1 in this series explored the changing nature of work over the last half a century, in particular looking at the change in work as a result of digitalisation and the evolving nature of knowledge work through the growth of the services sector and beyond.

Information technology has existed as long as there has been knowledge work. For example, the abacus dates from the second century BC. Later, it was the introduction of affordable mechanical equipment like the typewriter or adding machine that fuelled the growth of knowledge work in the economy. In these times, the people operating the equipment were often selected on the basis of gender rather than talent. Digital information technology further democratised access to more modern equivalents but also changed the way digitalisation impacts work and creates new forms of work.

This project brings together research from Australia and overseas, combining interviews with gathered experiences to form a view of the impact of digitalisation on people in organisations with regard to their acquisition and use of their skills. Taking this broader view of the changing economy and the impact on skills reveals a number of important dimensions catered for by existing institutions. A number of emerging trends are not as well served but are increasingly important. One of these is the recognition of invisible work and associated skills discussed in Report 1.

While change is being driven by digitalisation, to assume that building skills directly related to technology will solve the issue of a skills shift is underestimating the broader impact on work. This paper explores these impacts, examines some frameworks relevant to understanding the skills shift and outlines possible dimensions of an emerging skills acquisition model.

Evolving Skills Requirements

There is general agreement that a skills shift is needed when responding to the various forces driving change in a global (knowledge-based) economy – particularly when responding to change enabled by digital technology. Exactly what the skills shift looks like and what the shift is responding to, is far from generally understood or agreed though.

To bring together all of the various points of view on what constitutes appropriate skills for the 21st century has been the work of many analysts over the first 20 years of this century, and yet there is little consensus. One example: a focus on the value of interpersonal skills like communication has shifted to become a broader recognition of

the importance of collaboration, as work becomes increasingly distributed and coordinated through technology. This is also consistent with interviews done as part of this project with freelancers, software developers and designers citing collaboration as a crucial skill for working across teams and organisations.

Often the perspective of the job or line of work is seen to determine what skills are necessary. As work changes over time both in its nature and execution, the increasing number of training programs fails to address some underlying changes that impact work.

One possible cause of this is the interchangeable use of the terms re-skilling and up-skilling. These are actually two quite separate concepts. Re-skilling is a response to job changes (job loss or job creation), while up-skilling is a response to changes in the tasks *within* jobs. This is where the impact of digital technology is felt most but in less obvious ways.¹

There will be a demand for re-skilling as people switch between one job and another, a trend which is more apparent in millennials who do so as much by choice as by necessity. The impact of change will affect more people than that though, with the average Australian worker likely to change jobs 2.4 times over the next two decades. Workers who stay in their roles will also need to refresh their skills as job tasks change, often as a result of forces like automation and globalisation, at a rate of an average of 18% every decade.²

There is also often an assumption that everyone needs to acquire digital technology skills such as programming, because technology is driving change. Certainly there is a need for increasing levels of awareness of, familiarisation with, and skilled use of, technology which has impacted all workers over the past decades. This has also translated into programs like promoting STEM (Science, Technology, Engineering and Maths) in schools and elsewhere as institutions seek to produce technology-literate students. While technology can create the possibility of change, there are many more factors involved in the successful implementation of a digital technology beyond the creation of the technologies themselves. A skills shift that focuses on technology only is largely missing the point of digitalisation although it is useful for workers wishing to take on technology jobs specifically.

Taking a broader, holistic approach is the MAPNet framework developed by the Future of Work Institute at Curtin University. While this doesn't get down to specific skills or sets of skills, it "establishes a new way of thinking about skills based on the deep structure of work activities".³

The basis from which the framework is built is the concept of *mastery*, in which complex skills are an amalgamation of mastery over a number of basic skills, divided into technical and social skills. As more complex, higher order skills are identified and developed, this then feeds back into a renewal of mastery of basic or foundational skills.

The higher level skills for transformation, networking and integration are also part of the MAPNet framework and are broken down into finer detail and explored in the context of a changing work environment. The development of such complex skills in an organisation is needed at an increasing pace due to the speed of change. Yet most providers of education and training have yet to adapt to this new demand in terms of pace or understanding. Organisations also have limited capacity to develop talent internally in this way to ‘stay ahead of changes’.

Increasingly, this lag between identifying need at a task level, and fulfilling the associated skills gap, is becoming a key differentiator between organisations. This process will require a capacity within each organisation to map the evolving skills needs, identify skills sets required and participate in and encourage networks of learning that can allow individuals to ‘skill up’ as fast as the speed of change itself. This in turn requires a new approach to corporate learning and individual development which is vastly different from that of the past century.

Skills Acquisition

When most people think of attaining new skills they look to the education institutions or other professional bodies that have traditionally provided courses and qualifications. The underlying model for the delivery of education, further education and higher education (Schools, TAFE and University) is derived from the industrial approach of the previous century and focused largely on the delivery of school/campus based education and training based upon the idea of mass production. A degree course or an apprenticeship can take up to 5 years before a qualified individual is able to enter the workforce - long enough for entire industries to become extinct today.

The acquisition of skills necessary to allow individuals and organisations to be agile and resilient in the face of the dramatic change documented in Report 1, must occur both in a more timely manner but also in a much more granular manner. This must suit the needs of the individual when these needs are identified at different times for different people and also for different tasks that are being affected by change. While education institutions offer ‘short courses’ and even some online courses, any engagement in personalised, granular learning seems a long way off.

Another feature in a responsive or adaptive learning environment is the capacity for delivering small chunks of learning when and where it is needed, that is ‘just in time’. The processes and regulations of educational institutions were created to support a more industrial model of mass production in a ‘just in case’ manner. This is well suited to foundation skilling for schools, TAFEs and Universities where content doesn’t change in areas such as theory or practical skills like welding, where physics doesn’t change.

The shift to a model of adaptive learning for individuals has already begun with the growth of many services, often free, that are available on platforms like YouTube. These can range from the Kahn Academy, Skills Commons, Creative Live, Coursera

and other aggregators and producers of content to learning fragments contributed to MOOCs or the thousands of user generated ‘how to’ videos. Quality and consistency varies enormously but the relevance of any one piece of content to any one individual’s need at the right time can be very high. Below, we explore some features of an adaptive learning environment - who should be involved, what it is, and what other elements are needed to make it effective.

Adult Learning

The participants in this learning are adults, who have already undertaken at least 10 years of school and formal learning, are able to think in terms of concepts and are motivated to learn in the context of their job. This differentiates adult learning from the sort of learning that occurs in school which is called pedagogy or child learning. Adult learning is called andragogy, a term used by Malcolm Shepherd Knowles, who defined it as the art and science of adult learning. It now refers to any form of adult learning.⁴

Knowles defined five assumptions about adult learning that are different from those that apply to child learners. They are:

- Self-Concept - As a person matures his/her self-concept moves from one of being a dependent personality toward one of being a self-directed human being.
- Adult Learner Experience - As a person matures he/she accumulates a growing reservoir of experience that becomes an increasing resource for learning.
- Readiness to Learn - As a person matures his/her readiness to learn becomes oriented increasingly to the developmental tasks of his/her social roles.
- Orientation to Learning - As a person matures his/her time perspective changes from one of postponed application of knowledge to immediacy of application. As a result his/her orientation toward learning shifts from one of being subject- centric to one of being problem-centric.
- Motivation to Learn - As a person matures the motivation to learn is internal.⁵

Knowles went on to develop ideas around another characteristic of adult learners, namely that they are *self-directed* in that learners are motivated to assume personal responsibility and collaborative control of the cognitive (self-monitoring) and contextual (self-management) processes in contracting and confirming meaningful and worthwhile learning outcomes.⁶

Individual Responsibility

A key distinction between institutional learning in say, schools, and the sort of learning we are considering here is that the more paternalistic nature of considering the learner to be an empty vessel to be filled with knowledge is not the case with adults who have more world experience, prior learning and the motivation to learn new things. A model of self-directed learning is also a feature of adult learning as developed by Knowles. It is especially relevant here because the learner can

determine when to learn, how often and how relevant the learning is - all within the context of the job at work or away from work if the topic suits that.

While this approach has been around for many years, the adoption of the ideas in corporate learning is not well developed and this is even more true in institutional learning.

Discussions with organisations and individuals in the design and creative fields for this project showed not only an understanding of the concepts but an adoption of them in practice, particularly in relation to the acquisition of digital skills on an ongoing basis. This is largely done by individuals seeking out their own learning opportunities within projects but more often between projects to build relevant skills for future projects in a short time.

Micro Learning

In a broader context, this notion of personalised learning is also called micro learning. Micro learning is more than simply bite-sized training assets. Micro learning is focused and offers just the right amount of information necessary to help a learner achieve a specific, actionable objective. This makes micro learning in business contexts especially valuable.⁷ So, moving from an institutional context for learning to one where the individual learning is the focus in a business context, addresses one of the key issues with the question of up-skilling existing employees while they are working. This is keeping the learning relevant to the task, project or job (thus increasing motivation) while allowing time for the employee to learn while working and then apply what they have learned to the task or job.

The modern employee engaged in knowledge work will learn better if the subject being explored is relevant to the work and is available in a medium that allows for immediate access to the most relevant content. This improves both the learning outcomes and the work efficiency as well as eliminating the need for lengthy periods of learning engaged in larger learning structures, time consuming and fixed curriculum and place-based learning which is inappropriate for up-skilling employees engaged in invisible work.

The personalised nature of the learning material in terms of direct access to small chunks of learning with only a suggestion of an underlying sequence allows the learner to directly access what is needed and then find other relevant content. Tracking of progress, completion and then suggesting relevant next steps are also features of these micro learning environments. This implies that a small chunk of learning can have an achievement recognised and that it could be a part of a larger, recognisable piece of learning and even contribute to an existing qualification through a mapping process which can also be used to do rolling assessment.

Micro Credentials/Qualifications

The notion of micro credentials has broad application and can be successfully linked to the process of micro learning because assessment and accreditation, where

applicable, can add value to that learning beyond the attainment of skills. This combination benefits both the employee and employer as well as students who have completed degrees, certificates or year 12 in more generic qualifications aligning with the faster changing industry requirements.

It is possible to imagine existing institutions offering micro learning and credentials that aggregate up to the equivalent of today's qualifications like a degree. Also, these micro offerings can be offered by professional associations, larger organisations, services such as LinkedIn, or even communities of practice. Being able to map these small chunks of learning back to existing or new qualifications is a vital part of this model.

Interviews with the film and television industry as a part of this project showed that this approach has been the norm in that industry for decades in that new skills and ideas are assimilated between and within projects continuously. In particular, the acquisition of new digital skills in such areas as digital video editing and colour grading are continually changing. Editors need to stay current but do not have time to leave a project and do a full course and so they learn what is needed in small chunks of learning while still working on a project. This will also feed into and take advantage of the mapping done to link learning chunks with elements of more formal qualifications.

Content Curation, Quality and Discovery

Finding the right piece of learning material, the right tutor or mentor or the most compatible community of practice can be difficult. Yet, colleagues may have already looked, tried and succeeded in finding the right material or connections and could pass that information on. The step between active curation to establish a body of learning material and individuals trying and failing can be as simple as establishing a method of sharing success. In other areas of life, like selecting a movie to watch, finding a new piece of software or even a good coffee shop, this task of sharing across a community interested in the same thing is well established.

The digital tools to support these communities of interest have been refined over many years and now offer efficient ways of sharing. More traditional learning material though has been established in a publishing model that borrows from a retail model of supply which assumes demand exists and content is often only available from limited outlets. Modern content in small chunks that suits the micro learning model is more likely to be developed from the bottom up but that raises issues of curation and quality that will need to be addressed either by community input or more formal curation.

Communal content is also being supplemented by commissioned content across some of the aggregators mentioned above (like Creative Live) so that a broad range of material is available for a subscription but the material is both curated and communally rated. This is one way of ensuring quality and can be complemented by the addition of tools like ratings and rankings that reflect communal satisfaction with

the learning material.

Sharing links and preferred content can quickly become unwieldy as the community of interest grows and the number of choices also grows. Finding the right content for the learning task will not happen automatically or necessarily occur just by using Google but through a more considered discovery environment supplemented by intelligent tools and communal input.

Talent Tracking and Passports

Something apparent from the interviews in film and TV as well as that of freelance design was that the individuals took responsibility for their own learning, when they thought it was needed. This also extends to the recognition of the accumulated experience gained through working on various projects. An example here would be the addition of 'credits' to a CV or profile of an individual, for being involved in a certain capacity in a particular film. The same sort of thing is added to a CV in a business setting as experience but there is less formality about it and less consistency of acceptance for the idea of 'credit'.

Foundational qualifications are primarily gained from established education institutions and this won't change in the foreseeable future. The extended or additional 'qualifications' and experiences become both the responsibility of the individual but also of the community of practice that the individual belongs to. These can be recognised as guilds, for example, the Film Editors Guild of Australia. This concept can also be applied to other areas of endeavour and the role of the Guild can be replicated across bodies such as professional associations, Institutes or Chambers. Formal recognition of the full scope of the talent of an individual by such bodies is rare, though, since most seem content to offer courses (with certification of completion) or membership.

These elements of talent networks are small first steps towards a modern work environment that borrows from existing models like film and TV and then extends them using technology to connect individuals to multiple communities of practice as work moves to a networked project orientation. The emphasis will then be on the individual to continuously update their public CV, web site or in some cases a passport which is recognised by employers, peers, authorities and associations.

Portfolios

A final piece of the new world of work will be the transition to portfolio work which is the way that freelancers work today. This is project centric work across multiple projects or even organisations, often utilising a larger range of the individual's skills across multiple work opportunities. Organisations that are working in this (distributed work) way today are also looking at new mechanisms to:

- track portfolio learning and experiences,
- track talent and offer mechanisms for individuals to seek out new opportunities in the organisation where the individual is offered choices of professional development,

- expand mentorship and peer learning,
- codify project participation, and
- promote networking of communities of practice.

This approach is called an Opportunity Marketplace which can combine new job or task opportunities or learning opportunities. The underlying philosophy here is to support people to invest in themselves and move past the mindset that prioritises controlling costs over empowering people. Opportunity marketplaces are systems, digital platforms and virtual places that organisations provide, and where workers find, the opportunities most relevant to their mutual benefit and success. The enterprise offers its workers defined options for professional development, mentorship, project participation and networking amongst others. Empowered workers, in turn, can choose to pursue the opportunities they most value.⁸

In such an environment the need to provide individual agency in developing their work and learning portfolio is key - which is a long way from the approach to learning offered in many organisations. In some, corporate learning no longer exists and economic rationalisation trims what was once seen as an appropriate benefit - to allow individuals to learn while working.

Summary

Acquiring new skills in this era where individuals can access what they need and when they need to learn will require a re-think of the learning model towards a responsive, individualised and intermittent model suited to the working adult learner. This is in line with adult learning or andragogy, where the concept of self-directed learning is proven to be effective rather than a mass production or 'campus' model.

It also points to a number of other features for a modern learning environment which we are calling an adaptive learning model, with such features as:

- Micro learning,
- Micro qualifications
- Content curation and discovery,
- Talent tracking, and
- Passports and portfolios.

Whether existing education or training institutions can encompass this emerging demand remains to be seen. Similarly, corporate learning models seem to be based on more traditional approaches to save costs. Options are emerging from progressive institutions overseas, professional associations, new service players like LinkedIn, or even new startups targeting this need.

If Western Australia is to prepare for a new world where work can be done in a distributed manner, where work can be done from here for the rest of the world, then we will need a highly adaptive workforce who is continually being up-skilled to work in this new learning environment. This report is the start of a process to build out the thinking and ideas for a new learning environment suited to new demands.

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