



AI and Meaningful work: exploring the challenges for HR Professionals

Managing technology, work, and life after Covid-19

Report on AHRI-University of Newcastle/RMIT Research Study

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EXECUTIVE SUMMARY

The purpose of this research study was to obtain a broad understanding of the impact of AI on the future of job design and/or re-design in Australia. The project team focussed on the HR challenges that have/are being experienced in the quest for meaningful work in relation to artificial intelligence (AI), especially (post-COVID). To achieve this, focus groups were conducted comprising HR professionals (AHRI members) across 6 cities (Adelaide, Melbourne, Sydney, Perth, Hobart and Newcastle) spanning five states. The research is a follow up to a previous study supported by AHRI that was conducted during 2018-2019 (Burgess et al, 2019). Those findings were reported and presented to AHRI, published in the Asia Pacific Journal of HRM (Nankervis et al, 2021). The previous study comprised surveys and some interviews whereas this study consisted of interviews and focus groups with 12 participants. All participants were HR professionals, and the focus group/interviews were undertaken via zoom as per Covid requirements. Participants were from both the private and not-for profit sectors.

The findings indicate that Working from home (WFH) arrangements required by the enforced conditions governing work and workplaces during the COVID-19 crisis, have expedited the acceptance by organisations and employees for technological change and job re-design. It is anticipated that beyond the current COVID constraints that the future will involve hybrid workforces where tasks will be divided between those that can be undertaken remotely from the workplace and those that must occur at the organisational premises. For HR functions, it is anticipated that new technology will change work so that it will be less transactional and more meaningful. Challenges regarding these transitions include: the need for trust in the relationships between managers/supervisors and employees; the requirement that employee surveillance and privacy when working remotely is reasonable and legal; and organisational responsibility towards ensuring that all staff have adequate access to technological resources when working from home.

In summary, the findings indicate that HR managers are keen to ensure that the positive changes to work that became evident through the responses to COVID-19 are retained and do not revert to the previous more traditional state of work design.

Here it is proposed that AHRI could be of assistance by providing resources, case studies and awareness raising as well as advising government in terms of how AI adoption could be supported more widely in relation to preparedness for the future of work in Australia and for potential crises linked to pandemics and natural disasters.

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INTRODUCTION

This project was undertaken by a research team from the University of Newcastle, and RMIT. It was conducted during 2020 as a national research study exploring the views of human resource management (HRM) professionals about changes to work as a result of the increasing use of new technology and the implementation of artificial intelligence (AI) systems into the workplace. The research was undertaken during the COVID-19 crisis which provided an unlikely backdrop for the veracity of the topic. Research ethics approval for the study was obtained from the University of Newcastle Ethics Committee.

The study was supported by AHRI. Specifically, an AHRI employee sent email invitations to AHRI members asking them to contact a member of the research team if they were interested in participating. The research was conducted through focus groups/interviews undertaken through the meeting software program Zoom in two sequential phases at the end of 2020 and early in 2021. The focus groups/interviews included participants from Sydney, Newcastle, Melbourne, Perth, Hobart, and Adelaide.

RESEARCH DESIGN

The research questions explored: (1) the extent to which AI technologies are impacting on all aspects of work (the number of jobs, skills, processes, meaningful work, workplaces); (2) the response and strategic positioning of HRM towards predicting and responding to these changes; (3) the ethical challenges emerging from the introduction of AI and (4) the responses to these challenges, particularly since the onset of Covid-19.

The focus groups (see Appendix i) comprised either two or three participants, and interviews included one participant. In total this amounted to twelve participants. The research was undertaken using qualitative methods and a thematic snapshot of the combined focus group and interview themes follows.

The limitations of the study include the modest sample size and the inability to include participants from Northern Territory and Queensland as there were no responses from AHRI members based there.

RESEARCH PARTICIPANTS

Participant Demographics & Organisational Characteristics

The total number of **focus group/interview participants** was 12. The following table presents a summary of these participants' demographic characteristics including gender, industry, and location.

Table 1: Participant Profiles

	Gender	Sector	Location
Interview 1			
P1	F	Manufacturing	Newcastle
Interview 2			
P1	F	Engineering	Adelaide
P2	M	Public Sector	Sydney
P3	F	Bio-Manufacturing	Sydney
Interview 3			
P1	F	Consulting	Sydney
P2	F	Govt	Canberra
Interview 4			
P1	M	Consultant	Adelaide
Interview 5			
P1	F	Community Health	Melbourne
P2	F	Public support	Hobart
Interview 6			
P1	F	Property Development & Management	Sydney
Interview 7			
P1	F	Tourism and Hosp	Melbourne
Interview 8			
P1	F	Accommodation and Food	Perth

SELECTED RESEARCH FINDINGS

This section includes some comments from selected focus groups/interviews to illustrate a range of key points that emerged. Firstly, the interview framework is outlined as follows:

1 AI and meaningful work: exploring the challenges

Focus group participants were asked the following question in relation to this topic:

What is the extent to which AI technologies are impacting on all aspects of work, (i.e., the number of jobs, skills, processes, meaningful work, workplaces)?

Participants were asked to consider the following in their responses:

- Number of jobs
- Shares of part-time and casual employees
- Temporary and agency workers
- Offshoring jobs
- Homeworking v mobile work? Including changing skills sets, autonomy and responsibility and meaningful work
- New technologies including AI that affect meaningful work through job design and human interaction with technology
- Impact of COVID-19 and implementation of AI technologies

2 Anticipated strategic response and positioning

In relation to the current and anticipated responses of AI, focus group participants were asked:

- What does the fourth industrial revolution (4IR) mean to you?
- What do you perceive to be the role(s) of HRM in workplace innovation and the introduction and use of artificial intelligence, robotics and machine learning? Which HRM functions are most likely to be impacted by AI technologies?
- How do you expect these challenges to affect your own role, competencies and skills?
- How prepared are HRM professionals to balance the adverse and positive effects of AI on their workforces and specific occupations?
- What do you think you will need to do to better prepare yourself/employees and your organisation for (a) AI technologies, and (b) the workplace impact of COVID_19?

3 Ethical challenges

In relation to HRM implications focus group participants were asked the following:

- Are ethical and governance issues considered part of your HRM role? Please explain
- What are the most important ethical challenges associated with the introduction of 4IR technologies?
- What ethical issues have been, or might be raised by the management of COVID-19 in your workplace?

4 Strategies & Policies – Government & AHRI

Finally, the focus group participants were asked:

- What strategic policy interventions are you aware of at (a) government and (b) industry levels to address the likely impacts of the 4IR?
- What interventions do you think they should be undertaking?
- How do you think (a) AHRI, (b) industry associations, and (c) educational institutions could assist HR practitioners and others in preparing for the changes that are likely to occur due to the impacts of 4IR?

THEMATIC ANALYSIS of RESPONSES

Analysis of responses to the above questions resulted in several key themes being revealed.

This section identifies the themes, and sub-themes drawing from participants' direct quotes. A glossary of key terms can be found in appendix 2.

Theme 1: WFH expedited organisational/employee acceptance of technological change and job-redesign.

The findings indicate that working from home arrangements required by the publicly enforced conditions during the COVID_19 crisis expedited acceptance by organisations and employees for technological change and job-redesign:

...now that we originally had the crisis response, our future of work model is changing we will work differently. And so, we've been trying to focus on what skills are likely to be needed in the future and how we might give our people those skills. So, things like we're trying to introduce this learning environment whereby people continuously learn and develop, agility, flexibility, communication skills and then how our managers will manage what we call hybrid workplaces.

So, someone who never comes in the office, in fact I have not stepped foot in my office since March in South Australia except to clear my desk out. So, the chances of me going back are virtually zero. I will probably work from home on a permanent basis now. And that's true for many of our people. (p.2, int2)

Somewhat serendipitous outcomes also resulted in the emergence of sub-themes that support the continuation of greater technology usage:

I think again we really thought because there was so much going on that we've sort of been doing technology briefings over the course of this year and go wow, watch how all these things are going to start changing. And it's positive from the financial perspective as well because what it's allowing us to do is to see daily figures in real time. So how many hours have been booked to a job, who wasn't here, is there leave in there or otherwise. So, it's allowing us to actually rectify a whole lot of other issues that were quite invisible before. And I've certainly minimised my travel. We've been doing enterprise bargaining in Sydney and I've gone no I'm not losing a whole day to travel, I'll zoom in. So, it's allowed me to use my energy and time to

better effect because of Covid. And the flow on benefit is that with this huge project that was consuming so much of my time and energy, it's actually allowed me to be better paced and keep that moving along even though we've had to move, or we've moved into that bargaining as well (p.1, int1)

And

It would be really good to see us not go backwards. So, we've come quite a long way in a really short period of time while. It's not perfect, but we've been able to be a bit agile and quick with it, it'd be really, it'd be such a shame to go backwards and then start the long-haul process and, you know, the consultation to appoint and all that sort of stuff. So, I guess that's always been a little bit on my mind that let's not go backwards, let's just enhance, let's enhance what we already have now 'because you know what, we've proven we can do it and then you know how we sort of simplified all of that process, let's just keep that 'because that worked. (p1,int5)

Theme 2: Hybrid workforces of the future will be organised by tasks

It is anticipated that future workforces will be hybrid where tasks will be divided between these that can be undertaken remotely from the workplace and those that need to be undertaken at an organisation's premises.

I mean personally for our organisation we have operated a working from home model for specific individuals that can actually work away from home. Again, we're pretty small and we're fairly agile and it's never been about presenteeism for our individuals. So, providing the work gets done, people can flex that around how they do that work in the times that they work.(p1,int2)

And,

We have given up floors. We've given up floors in pretty much all our states in buildings and we will not return to full presenteeism, we'll operate a hybrid model and so all those social and safety points that [name deleted] made ring true for us. (p2, int2)

WFH benefits emerged for both employees:

Working from home has given half of our workforce here a very significant pay rise in effect. Yeah, because 50 percent of our people would take at least an hour and a half to get to work. And the costs associated with that and doing laps of the neighbourhood trying to find a park and all that. You know, that's actually putting cash in your pocket. (p3, int2)

And employers

Yeah, knowledge sharing was that we put on quite a few events, but we did it all online throughout the year and what was really great we got, from not just Tasmania, people from Queensland, WA, it was just a really great, yeah, knowledge sharing as you say and got people's different points of view that just weren't sitting in, you know, what are the issues in

Tasmania, for example. So, it was really this broad spectrum and that's something that we really want to hang onto and to sort of, we felt, I guess, didn't feel the isolation, we felt more part of Australia that way, it was really quite ironic because we were all online together and we were doing this sort of thing and people were very generous with their knowledge sharing and what worked for them and what we could learn etc. So, the traditional way of having an after work or a lunch event has really changed, it's really more about this sort of thing, and doing it, you can do it from your desk or your phone as well too. So that really, I guess, improved our reach, and then flipped it, we sort of got a lot of different ideas and thought processes what works in other organisations far broader than we ever would have 'because we would have just been in our state sort of thing. So, the, I guess, seeing that collaboration Australia wide would be a fantastic mechanism to still keep in place.(p1,intg5)

Although benefits were not without cautions:

I think if you look at it from a staff point of view, there will be an increasing push to have a hybrid version of working and we're already seeing that now, but it's been a total mix. I think we will see the same with workers. We already hear it; some people are loving it from home. Some people hate it, some people want a hybrid, and I don't know how HR is going to possibly now keep everyone happy with that. I think it's going to make workforce management and workforce planning very difficult (p.1 int3)

And along with the positive aspects, areas for concern were also highlighted:

So, people hated working at home because they don't have good internet connection. And they're going, it's already difficult enough when you're in the office but you add that complication of having to go through another relay and it just drove them crazy.(p.1,int1)

Other areas for concern are outlined in Theme 4 in relation to ethical issues.

Theme 3: New technology use can result in more strategic and meaningful work

For HRM and other organisational functions (i.e., accounting), it is anticipated that new technology will change current ways of working so that work will be less transactional and more meaningful. Job design and content are changing as a result. Accordingly, there are two primary expectations for jobs. The first is that job redesign will result in some employees being 're-purposed' , however others will be 'replaced' .

It will process and prepare for payment; it will have an impact on our staffing levels. Now our accounts team, our accounts payable team at the moment is three full time people and a short-term temporary person. We see that that will probably...be down to two people within about six months maybe sooner. And ultimately it could even be just one person who essentially is the final check and press the button to process those payments as approved.(p.1 int1)

So, we've got...and the approval process was very manual of those bundles of paper going to a supervisor for checking to the payroll and all that data was keyed in. So, we're going to see a flow on effect of that data going automatically to reconcile with payment of those employees. Ultimately, well that's already having a significant impact...one of our payroll data entry

people, has probably got back a day and a half, or two days a week. And we're now diverting her to other tasks so she's at no risk of losing her job, but she's been moved into more value adding tasks that need human intervention.p.1, int1)

We've seen any number of really smart solutions where data's been capable of being perfectly well integrated from different sources by a software application, and we can use it in that form, or the community can access it directly in that form. And that's doing away with those sort of positions (p.3, int2)

What we do see I think is, and a good example would be HR manager and information systems as they become more sophisticated, we're seeing that the payroll functions and those sorts of things require far less manual intervention. But rather than lose jobs what I think we see from time to time is where they've had a big impact is that we're getting people to focus on the more complex, the more value-added kind of involvement in whatever the job might require.(p.3,int2)

And potentially some new roles for HRM

Well, just in the last ten years I would have said, so ten years ago if you were recruiting somebody in a HR role, there might have been, particularly at the lower, in the entry level, you might have been looking at somebody who was good at processes, sort of transactional activity. Now you're looking for somebody who is tertiary qualified, has a speciality and so brings to the table a deeper understanding of all the sort of things that impact on HR activity. Whereas I don't think that was the case even just ten years ago.(p.3, int2)

And...

But I do talk to probably just as a side note I think, and this is the advice that I did give to a government department. HR professionals are not traditionally technologically adept. They always leave it for I.T. But if you leave it for I.T to program and code these kinds of systems, without HR having strong involvement in that, then you can end up – it doesn't matter how good the programmer is, you can end up in systems that give outcomes that you might not anticipate. I haven't seen any widespread examples of it happening. But I'm sure that it would be happening if HR don't have the capability to engage in technology professionals to make sure it's designed to circumvent those kinds of things. (p.1, int4)

Theme 4: New technology use/hybrid working brings challenges concerning ethical decision making, employee surveillance, trust and privacy when working remotely.

Cautions regarding the transition to higher technology use and hybrid workforces include ethical decision making, the need for trust, and the requirement that employee surveillance and privacy when working remotely is reasonable and legal.

I think it's a major ethical issue in terms of the datasets that are used to build the AI and I think, you even look at something as simple as using AI for decision making around recruitment or culling CVs through a recruitment system. If you just have the right words, is that okay? If you have the right looking photo, is that okay? All of that AI is built on datasets and if those datasets don't reflect the cohort that they're trying to predict, it is exceptionally biased and problematic and won't give us what we want out of it. It will culturally make things

harder for us in the future, so I think there is... the way that AI is programmed is the biggest issue. (p.1,int3)

And I think in HR, if we want to have, we focus very much on diversity and inclusion and positive cultural experiences within an organisation, if we have incorrectly programmed AI making decisions or training our staff in a certain way for example, we can actually be perpetuating that group think or we're perpetuating a culture perhaps that we don't want. (p.2, Int3)

And that's all coming from management, but I think we've also, the way we communicate now for example via Zoom, we know so much more intimately about each other than we have previously because we can see what's going on in the background and we hear the children in the background etc. But on the other hand, we don't have that filter that we would have when we go into the office and we put our professional kind of face on, and we only share what we want to share about ourselves.

So, the expectation that if you've got a blurred screen, 'what are you hiding behind you' or 'you've got an interesting book on the bookshelf behind you' so I'm going to start probing about something like that. So even how much we can share about ourselves I think has changed a bit, the way we communicate, let alone the time of day we're communicating. (p.1, int3)

...like I said, organisations are going, we don't know if they're working. They might not be there; they didn't respond to my email immediately. And that has created issues of trust. Again, I think largely they were probably there beforehand, and they've just been magnified through these kinds of processes. (p.1, int4)

Theme 5: WFH challenges concern poor technology, longer working hours and performance management issues

Organisations need to ensure that: all staff have adequate access to adequate technological resources when working from home and that working hours do not extend unreasonably as outlined by some focus group members.

...but I think technology is a big one for us. We've got offices across 70 locations, so we do need reliable technology especially for learning and development and even for our intranet, we've got a number of remote locations as well. We have had issues with technology during the year. I guess, where our offices are located, some are in capital cities, some are in regions, but some are very remote and we do find that the technology and connection speeds, abilities vary quite a great deal and does impact our staff. It creates a fair bit of frustration and anxiety about not being able to keep in touch I think. This year was key for needing to communicate with staff well and regularly. When we haven't had a reliable intranet or learning platform, that has really impacted staff a lot. (p.2, int3)

So, it only works particularly well for those that are wealthy enough to be able to have our own spaces. If you're working from a lounge room where you've actually got your small children running around or you've got someone else working beside you or like, so it works for, I think works for rich people, you know what I mean? So, in actual fact, if you're looking

at how do we support our staff, it's around it works well for a small group but they're the majority. (p.2, int5)

I know it's not a new thing but with the technology comes the responsibility of always being on. People have got their laptops, but they've also got their phones, they get their emails on both. I think Covid has exacerbated that, extended the workday, because people have been working from home. I've found in my agency that people have been working longer days and it's been expected that they are available for meetings at 5:00, 5:30, 6:00, 6:30 because you're working from home. (p.2,int3)

I think that's led to some challenges to do with you know, I've heard anecdotally, many organisations have had a decrease in the use of sick leave. Which is you know, on the surface level positive but it means people are working longer, harder, not taking that time off when they're unwell. Not recovering and there's real risks of you know, fatigue, burnout, from a workplace health and safety perspective as well. Because people are working off and more 24/7 and organisations are happy with that because people are so available responsive. But I think there's some longer-term challenges that organisations may be starting to experience. (p.1, int4)

Trust related to whether employees were performing when they are not physically present was another new challenge for management when employees work from home. Some participants indicated a challenge concerns how performance is measured and what it is understood with regard to whether or not employees are productive. Some also indicated that productivity measures were not that accurate prior to the Covid-19 restrictions leading to WFH prevalence.

So, what I find is from a HR outcome perspective when we're looking at these, a lot of organisations, it was found out that they didn't know what good performance looked like in my view for their organisation. While people were delivering inputs by sitting at desks and turning up, there was some level of trust and comfort that came from that. But then take that physical input away from them, they weren't sure what employees were producing. And I don't think they were either anyway, many organisations.(p.1, int4)

Something else that's come up for me with my network is not being... or questioning the work and input of others in the team and the effectiveness of others within the team based on how often they're online, how responsive they are, the hours that they work etc, and not feeling that performance issues are being dealt with fairly. They might not be able to see how those performance issues are being dealt with. (p.2, int3)

Theme 6: WFH brings challenges related to isolation/mental health

There were many references to mental health concerns related to WFH indicating it is a key issue for HR professionals.

... it's about how we again make sure we've got that connectedness, sociability, the mental health, how people can monitor productivity, etcetera. So, that real different way of working is going to be the focus and on a permanent level as opposed to a crisis response level. (p.2int2)

There's been a quick pivot towards mental health as an aspect of health and well-being. In our workforce 95, 96 percent of our workforce don't come from municipality. They come from all over Sydney from as far away as the central coast, Campden, Penrith, down to Wollongong. The isolation and other aspects of working remotely has created a whole different set of issues around health and well-being and managing that in addition to managing people and performance in the normal way, they're issues we don't have the answers for just yet. (p.3, int2)

I think technology can be a bit of a distractor to HR and to management, thinking that that's going to solve their problem. Either getting staff back into the office or just having better technology to connect us all, and it won't help us as you say XXX, focus on things like mental health and that social cohesion and feeling of inclusion and the collaboration. I think it's very dependent on the organisation as to how much they want to harness technology or not. (p.1, int3)

Some organisations had taken quite an innovative approach to engaging with their remote workforces:

...We've got a number of initiatives that are happening around again various mental health topics and where you can actually go online and do some personal assessment work on an ongoing, longitudinal type study to assess how you're feeling at this point in time versus how you were last week and the week before. So, again there's a whole piece around how we engage with remote workers and make sure that we look after their health and well-being. And that's just one of the examples. Another example that's really is good is that we had, for example, we did surveys around, or rather we did some analysis around where people lived. And so, in our Sydney office for example, we identified which suburb people were from and they could link up with people in their suburb and actually go for a walk. So, they were interacting with people from work even though they weren't in the office and going for lunch time walks or a coffee with people who live nearby them. So, things like that really that we've been trying to do. (p.2, int2)

I think there's always opportunity for improvement. There would be very few organisations that would say they haven't learnt anything through Covid and having staff out of the office. I know for us there's a push now to get a default return back to the office and one of the reasons about that is the mental health and that connection. That kind of team cohesion and connection and social connection as well which I think some people may have sorely missed and continue to miss if they do work from home full time..... (p.2,int3)

These issues are also related to employees' need for social meaning from work:

... we've had to retrain people in all of these new ways that we do things but training as we know is only one component of it and it's all the building, capacity bit, which is much, much harder when you're doing these new ways of working. So, I think we have to really think about that, yeah, 'cause normally you'd build capacity by having a chat to someone about the coffee room, you'd do this, have you seen this new thing, you can't do any of that now. (p.2, int5)

I think with artificial intelligence, you're taking away purpose and meaning for people, and especially if you look at people that are so connected with the company and have worked here for such a long time, this is their purpose, this is why they get up at 7 o'clock in the morning and rock up to work at 9 o'clock and leave, or whatever the time may be. So, I think there

needs to be a responsibility for the company that's implementing artificial intelligence to make sure that these people are okay. I think your responsibility and duty of care goes beyond what you do for them at work because you're impacting them with decisions that you're making it work, yeah definitely. So, I think that would a big one in how, I don't know the answer to that I must say. (p.1, int8)

I guess what's interesting to add to that is just the safety piece. So, we've had to make sure that people have safe systems of work and all of those things which is super important, but I think it's more of a social piece. We have a fairly dynamic team but there are huge extroverts, huge introverts and they've been some real struggles with people trying to embrace working from home that miss that social connection. And I don't think that in all the technology, the Zooms and the Skype's, etcetera, can connect you as well as some of the face-to-face meetings that people need and want to have in terms of some of the strategic activities of the business. (p.1,int2)

DISCUSSION & RECOMMENDATIONS

There have been several studies that have considered the advantages and challenges associated with WFH (ACTU, 2020; Dayaram and Burgess, 2021). However, this study set out to specifically address issues related to new technology introduction and the challenges related to WFH due to the outbreak of the Covid-19 pandemic. The findings outlined here suggest that WFH and technologically mediated work arrangements will continue to be further developed as organisations move towards what are, in some cases, semi-permanent hybrid workforce models. Recommendations that emerged from the study include:

1. There will be further applications of IT and new technologies to support work and HRM functions. Consequently, ensuring staff are IT literate will be a priority;
2. In turn, resources and infrastructure must be set aside for the training and the provision of adequate access to software, IT hardware, and IT infrastructure. Currently there are inequalities in technology access depending on employees WFH locality.
3. WFH will no longer be a novelty, with hybrid working the way of the future. Clearly, WFH options generate potential gains to organisations and employees. However, WFH also requires cognisance of challenges including extended and unsociable working hours; surveillance/compromising privacy; and the right to disconnect.
4. HRM functions are shifting from transactional to more strategic orientations as more processes are automated and delivered through software systems. This will require HR professionals who are IT literate and who can shape the applications of software systems. WFH brings challenges related to isolation and mental health issues indicating a need for innovative strategies to engage employees and support collaboration and inclusion.

5. Line managers are facing challenges related to the performance management of hybrid workforces as WFH employees are not physically present. This indicates the need for more outcome as opposed to physical assessment of workplace productivity.

Implications for the HRM Profession

Bearing in mind the recommendations outlined previously, it is proposed that, for the HRM profession, there are five key challenges that need to be addressed as a result of new technology introduction/hybrid working:

1. Skills development will be required for HR professions to accommodate an increase in IT applications across the workplace and due to the subsequent impact on job content there will be increased digital literacy related skill requirements for organisations;
2. Linked to this, it is proposed there is a need to develop a set of core skills and attributes that are suitable for professional accreditation in an age of more intensive IT applications, greater use of AI, and management of a hybrid workforce;
3. Guidelines need to be developed that address labour force regulations such as reasonable hours and the right to disconnect, as well as ethical and organisational objectives related to the management of hybrid workforces' standards;
4. Innovative strategies are required to address isolation and potential mental health issues for WFH employees that include self-care and organisational practices;
5. Productivity measurement needs to change to address WFH/hybrid work models. This is likely to require management-employee trust and more output related measures. It may also require a re-evaluation of job design including consideration of what constitutes meaningful work.

In summary, this study has highlighted some of the issues arising from the organisational 'pivots' required from non-frontline workers due to the WFH edicts following the outbreak of Covid-19 in Australia. Clearly, while some HR professional/organisations have been creative with the challenges they have faced it appears they would greatly benefit from support from associations such as AHRI. This may be in the form of discussion forums, education and training, toolkits comprising strategies and supporting material, and ongoing dialogue/advice to address the changing nature of work due to new technologies and the Covid-19 pandemic responses.

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APPENDICES

Appendix 1 – Focus Group/Interview Framework

A. PARTICIPANT DETAILS

1. Can you outline your experiences in the industry sector(s) where you work?
2. What are your current position(s)?

B. EXTENT OF TECHNOLOGICAL IMPACT

C. CURRENT & ANTICIPATED RESPONSES AND STRATEGIC POSITIONING

D. ETHICAL IMPLICATIONS

10. How do you expect these challenges to affect your own role, competencies & skills?
11. How might they affect policies and practices – for example, HR planning, job design, talent attraction and retention, learning and development, rewards and benefits, career planning?
12. How prepared are management to balance the adverse and positive effects of 4IR on their workforces and specific occupations?
13. What do you think you will need to do to better prepare yourself/employees and your organisation?
14. Are you aware of any examples of innovative case studies in different industry sectors which illustrate effective principles and practices for managers to develop in addressing 4IR

THANK YOU FOR YOUR CONTRIBUTION

Appendix 2 – Glossary of terms

3D-printing is any of various processes in which material is joined or solidified under computer control to create a three-dimensional object, with material being added together (such as liquid molecules or powder grains being fused together).

Artificial intelligence (AI) is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals.

Automation or automatic control is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat-treating ovens, steering and stabilization of ships, aircraft and other applications and vehicles with minimal or reduced human intervention.

Big data is a term used to refer to data sets that are too large or complex for traditional data-processing application software to adequately deal with.

Cloud computing is shared pools of configurable computer system resources and higher-level services that can be rapidly provisioned with minimal management effort, often over the Internet. Cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to a public utility.

Machine learning (ML) is a field of artificial intelligence that uses statistical techniques to give computer systems the ability to "learn" from data, without being explicitly programmed.

Mobile technology is the technology used for cellular communication.

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags (which contain electronically stored information) attached to objects.

Real-time location systems are used to automatically identify and track the location of objects or people in real time, usually within a building or other contained area.

Robotics deals with the design, construction, operation, and use of robots, as well as computer systems for their control, sensory feedback, and information processing.

Sensor is a device, module, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor.