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Article

Navigating Workforce Transformation: HRM Strategies of Rural and Regional Australian Councils in the 4IR Era

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Abstract: The context for the study reported here is the Australian local government sector, specifically rural and regional councils that operate in isolated and remote areas with limited staffing and resources. Within this sector, 4IR technologies are transforming service delivery, jobs, and skill requirements. The purpose of this study is to examine how public sector organisations operating within a regulated and not-for-profit context and with constraints over HRM choices manage the challenges of the 4IR technologies on their workforce. Information from the study was sourced from semi-structured interviews with council managers and CEOs, independent experts familiar with the sector, and council documents. Triangulation of the information was applied to develop themes linked to workforce management, especially innovative HRM programs that were shaped by the constraints that councils faced in the management of their workforce. The findings indicate that regional and rural councils were able to manage the impact of 4IR technologies on their workforces through programs that drew on internal staff development and inter-council resource sharing.

Keywords: HRM strategies; innovative HRM practices; local government (LG); workforce development; fourth industrial revolution; rural and regional councils; digital transformation; public sector; Australia



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1. Introduction

The digital transformation driven by the Fourth Industrial Revolution (4IR), which includes technologies such as artificial intelligence (AI), cloud technology, the internet of things, machine learning (ML), big data, renewable energy, autonomous transport, 3D printing, and satellite technology (WEF, 2016), is transforming innovation across public, private, and non-profit sectors globally (Nankervis et al., 2019). The extent and speed of the transformation process has led to speculation on the future of work, including the loss of jobs, the replacement of humans by robots and AI systems, and the erosion of skills and careers (Burgess et al., 2021).

This transformation is reshaping industries and work environments, presenting challenges and opportunities for organisations (Patil & Shekhawat, 2019; Roblek et al., 2016). In Australia, LGs have embraced 4IR technologies, incorporating them into operational initiatives and service-based digital projects (AIIA, 2020; Australian Local Government Association [ALGA], 2022). All areas of LG operations, such as road maintenance, traffic management, refuse management, library systems, and customer engagement, have been transformed by 4IR technologies (Australian Local Government Association [ALGA], 2022). The adoption of these technologies presents challenges, including navigating governance

complexities, aligning technological initiatives with organisational goals, and managing the workforce for technological disruption including skills and job redundancy, and new skill demands. Local governments (LGs) face shifting community needs and financial constraints, and they are under growing pressure to innovate by leveraging 4IR technologies to improve service delivery and operational efficiency, retain staff, recruit staff to fill new job and skill needs, and to reduce costs (Knowles, 2020).

The LG sector is heterogeneous in terms of its financial capabilities, labour market conditions, and service obligations; specifically, the type and scale of challenges differ between rural/regional and metropolitan LGs (Adendorff et al., 2021; Australian Local Government Association [ALGA], 2022). Metropolitan councils benefit from financial resources and larger workforces, a wider skill base, and access to supporting services and expertise, including training and education institutions. Rural and regional councils, in contrast, operate with limited resources, in small and isolated communities, across a large geographical space, with different service obligations, and with small staff with a limited skill base (Adendorff et al., 2021; Australian Local Government Association [ALGA], 2022; Shaikh & Burgess, 2021). Their work environments, coupled with the need for innovation within constraints, make these councils a critical area of study for understanding how small- and medium-sized LG organisations address the workforce challenges accompanying the application of 4IR technologies to service delivery. Unlike large metropolitan councils, regional and rural councils have a limited skill base, face recruitment and retention challenges in a tight labour market, have flat organisational structures, and in many instances do not have a designated HRM division (Australian Local Government Association [ALGA], 2022).

This study evaluates the HRM strategies employed by rural and regional LGs in accommodating and harnessing technological change. This research examines how rural and regional councils navigate the workforce challenges posed by 4IR technologies, thereby contributing to the understanding of the development of HRM responses to the workforce challenges imposed through technological transformation. Context and institutions influence the selection and development of HRM programs. In this case, this study is centred on the public sector, where organisational goals and operational processes are codified, often regulated by state governments. HRM choices are determined by council guidelines developed by state governments and elected officials. HRM decisions are constrained by a tight labour market with skill shortages and by an industrial agreement that limits the use of staff redundancies as an HRM response to technological disruption (NSW Industrial Relations Commissions, 2023). Strategic HRM programs are driven by institutional and contextual constraints (Cooke, 2018). Through evaluating how regional and rural LGs navigate the workforce challenges associated with 4IR technologies, this study identifies HR programs that are relevant for not-for-profit organisations that operate with limited resources in a tight labour market and with organisational and political constraints. The findings have resonance for small and medium not-for-profit organisations.

This study is driven by the following research questions:

- What are the key workforce challenges faced by Australian rural and regional councils in the adoption of 4IR technologies?
- What HRM strategies are rural and regional councils employing to manage the workforce impacts of 4IR technologies?

2. The Australian Local Government (LG) Sector

The government in Australia is divided into three tiers: central or federal, regional or state, and local. Each has assigned responsibilities and taxation bases. LGs have access to limited taxation revenue and are dependent on grants from the federal and state

governments to provide local services (LGA, 2023). Local governments (LGs) are elected, not-for-profit entities accountable to their local communities and regulated by state governments (LGA, 2023; Worthington & Dollery, 2001). They provide community services such as infrastructure maintenance, waste management, local planning, community health and safety, community and creative activities, and social support programs (Australian Local Government Association [ALGA], 2022; Tran & Dollery, 2019). Service requirements and the capacity to deliver varies across councils based on council size, geographic location, and financial capacity (Australian Local Government Association [ALGA], 2022; Shaikh & Burgess, 2021; Uppal & Dunphy, 2019). Councils differ in size, financial capabilities, and responsibilities. Some councils manage areas less than a few square kilometres, while others cover vast regions over one hundred thousand square kilometres (Australian Local Government Association [ALGA], 2022). These geographical differences impact the types and costs of services to be delivered (Australian Local Government Association [ALGA], 2022).

More than 6500 elected councillors manage and plan LG operations (Shaikh & Burgess, 2021). LGs provide similar services to residents, and each LG operates within the constraints of its financial capacity, local service needs, and local labour market conditions (Uppal & Dunphy, 2019). LGs provide over 150 services and spend around AUD 34 billion annually (Australian Local Government Association [ALGA], 2022). LGs are significant employers, especially in regional and rural areas, covering 400 occupations (Australian Local Government Association [ALGA], 2022). In 2023, the sector employed 208,000 workers (ABS, 2023). The responsibilities of LGs have expanded over time due to increasing community demands, intergovernmental grants tied to delivering specific activities such as improving major arterial roads, and the need to address local crises such as flooding, fires, and droughts (Australian Local Government Association [ALGA], 2022). This has increased the demand for multiskilled and specialist staff (Essential Services Commission, 2021; Yarram et al., 2021). The LG sector faces significant challenges, primarily due to financial constraints due to the limited taxation base and underlying growth and shifts in the distribution and demographic of the population. State governments control local decision-making through legislation on performance and governance and through imposing conditions on intergovernmental grants, which restrict councils' operational flexibility and financial autonomy (Richardson, 2011; Shaikh & Burgess, 2021).

LGs are adopting a range of 4IR technologies to enhance operational efficiency and service delivery. LGs have implemented smart traffic management systems, AI-driven solutions, and drones for infrastructure inspections, improving waste management and recycling, improving urban traffic flows, and supporting road maintenance (Gov Tech Review, 2023). Councils are adopting data analytics, cloud-based platforms, GIS, and collaboration tools to streamline operations, improve decision making, and enhance service delivery (Australian Local Government Association [ALGA], 2022; Gov Tech Review, 2023). Automation and the digital delivery of services have saved the sector an estimated 40% of time spent on repetitive tasks, with potential savings of AUD 14.9 billion annually (Deloitte, 2015).

Rural and regional councils face significant barriers to adopting 4IR technologies, including limited resources, workforce shortages, and digital infrastructure challenges such as internet access (ESC, 2023; McQuestin et al., 2022). Budget constraints hinder investment in advanced technologies, and attracting skilled workers is further complicated by poor internet connectivity and geographic isolation (Australian Local Government Association [ALGA], 2022; Bwalya, 2020; Watson & Ryan, 2020). Resistance to change by councils, managers, and employees and a preference for traditional service delivery methods further impede technological adoption (Andersson et al., 2022).

Despite these challenges, 4IR technologies are expected to continue reshaping service delivery across all levels of LG. LGs have to manage technological innovation through workforce upskilling, retraining, and hiring specialist staff familiar with the new technologies ([Australian Local Government Association \[ALGA\], 2022](#)). The financial disparities between metropolitan and rural councils, along with workforce retention challenges, highlight the need for targeted and specific HR programs that are framed by local conditions that include financial capacity and the state of the local labour market ([Adendorff et al., 2021](#); [Australian Local Government Association \[ALGA\], 2022](#)).

3. Local Conditions and Institutions Shaping HRM Programs

There are many studies on the impact of the 4IR technologies on jobs, skills, and careers ([WEF, 2016](#); [Nankervis et al., 2020](#)) and how organisations are responding to the workforce challenges and opportunities associated with the application of 4IR technologies ([Nankervis et al., 2020](#)). Many of the studies are specific to a particular technology, country ([Chang, 2020](#)), or an occupation or industry ([Dhakal, 2021](#)) and provide case study illustrations of the workforce consequences and management programs associated with the introduction of the new technologies ([Nankervis et al., 2020](#)). Given the range and application of 4IR technologies across industries and occupations, it is difficult to generalise about the implications of the studies for jobs, skills, and workforce management. However, the research suggests that the 4IR technologies contribute to organisational objectives (profit, efficiency, competitiveness, and sustainability) ([WEF, 2016](#)) and that organisations require proactive workforce management programs to align staff skills, competencies, and profiles to the new technologies ([Schwab, 2016](#)). Here, strategic HRM programs are required to manage the disruptive impact of the 4IR technologies in terms of redundant skills and jobs, skill acquisition, filling new jobs generated by the technology, and realigning staff profiles ([Burgess et al., 2021](#)).

In studying the workforce impact and management challenges associated with the 4IR, context and institutions are important in determining outcomes and shaping responses. [Cooke \(2018, p. 6\)](#) states that “context is important in understanding the real world because it provides insightful information about the organisational and environmental setting, the climate of the organisation or setting, history or conditions influencing the situation, and the broader current concerns or issues within which a particular organisational phenomenon being studied”.

The identification of the context for HRM studies is driven by prior research, researcher interests and biases, and the issues being assessed ([Cooke, 2018](#); [Gooderham et al., 2018](#)). In this study, the identification of the important contextual conditions was driven by surveys of the sector ([Australian Local Government Association \[ALGA\], 2022](#)) and through the information provided by respondents and organisational documents. Context conditions incorporate labour and product market conditions, organisational objectives, and stakeholder interests. Institutions, especially the labour market and socio-political institutions, also shape impact and workforce management choices and result in cross-firm, cross-industry, and cross-national differences in the selection of HR programs ([Gooderham et al., 2018](#)). In assessing the application and management of 4IR technologies, key institutions include labour regulations and collective agreements covering managing workforce redundancies, regulating conditions of employment including operating hours, shift patterns, and occupational health and safety ([Gooderham et al., 2018](#)). Political conditions will also impact application and management decisions; for example, localised job losses or the need to hire immigrant labour to fill new and specialised jobs can constrain the choices around HR programs. Importantly, the public sector context means that organisational objectives are linked to service delivery and subject to political oversight and legislation.

The interest in this paper is with innovative HRM responses to disruptive and challenging 4IR applications. [Koster \(2018\)](#) suggests three alternative views of innovative HRM: HRM processes that are new or novel, HRM processes that drive innovation, and innovation that drives HRM processes. In the following analysis, the HRM processes identified are not new; they may drive innovation through the acquisition of new staff and new skills, but they are being driven by the application of new technologies. The shape and extent of the innovations are driven by the contextual constraints faced by LGs.

For the Australian LG sector, specifically rural and regional LGs, there are important contextual and institutional conditions governing 4IR applications and management. First, LGs are not for profit; they must, by legislation, provide a range of services to local communities ([Uppal & Dunphy, 2019](#)). Fourth Industrial Revolution technologies can improve service delivery and efficiency, but the services cannot be discontinued. They can be outsourced or provided through public–private partnerships, but they must be provided. Second, LGs are political entities with elected officials and responsibilities to the local community. Local stakeholder interest is another contextual condition to consider. Third, LGs in Australia are unionised and have collective agreements that limit staff redundancies and preference retraining over redundancy ([ASU, 2024](#); [Kochan & Kimball, 2019](#); [NSW Industrial Relations Commissions, 2023](#)).

Fourth, across the LG sector, there are tight labour market conditions and skill shortages ([Australian Local Government Association \[ALGA\], 2022](#)). This is especially challenging for the LG sector, as it has difficulty competing against the private sector and the better-resourced state and federal governments for managerial and key staff ([Australian Local Government Association \[ALGA\], 2022](#)). Furthermore, an ageing workforce and imminent retirements place further pressure on LGs in terms of the loss of organisational and technical skills ([Connell et al., 2015](#)). Labour market conditions support the importance of staff attraction and retention, especially at a time of workforce disruption generated by 4IR technologies.

For rural and regional LGs, the workforce challenges are further compounded by isolation and remoteness with shallow local labour markets and challenges in attracting staff from urban labour markets ([Adendorff et al., 2021](#)). The financial disadvantage for regional/rural LGs further compounds the difficulties in attracting managerial and specialist skill staff ([Australian Local Government Association \[ALGA\], 2022](#)). With fewer staff and occupations on average as compared to metropolitan LGs, rural and regional LGs have flatter organisational structures that limit career mobility, and this further exacerbates staff attraction and retention ([McQuestin et al., 2022](#)). Limited supporting HRD infrastructure including educational and training institutions places further constraints on rural and regional LGs in accessing and developing staff ([Uppal & Dunphy, 2019](#)).

Operating within the above contextual and institutional conditions requires innovative HRM programs. The application of 4IR technologies compounds the challenges associated with relative isolation, limited financial capacity, and a constraining labour market. This research sets out how the workforce challenges are being addressed, highlighting what is innovative in terms of finding solutions that accommodate the context and constraints faced by LGs.

4. Research Methods

This study applied an exploratory qualitative design to examine the workforce impacts of 4IR technologies on rural and regional LGs. Qualitative research is appropriate for capturing diverse perspectives ([Gray, 2020](#); [Flick et al., 2004](#)). It allows for close interaction with participants and enables respondent-led inquiry, which is useful in fields with limited theoretical development ([Yasir et al., 2019](#)). An exploratory approach was appropriate for

gaining insights into an under-researched sector (Ayentimi et al., 2018; Bryman & Bell, 2011). This approach is well-suited for exploring the HRM responses to the challenges posed by 4IR technologies.

Semi-structured interviews and secondary data analysis were the primary data collection methods (Braun & Clarke, 2006; Gray, 2020). The research was conducted in several stages. Phase 1 involved reviewing existing literature to establish an understanding of the research context. Phase 2 comprised semi-structured interviews with 18 participants in managerial and leadership roles within rural and regional LGs between 2023 and 2024. Phase 3 involved semi-structured interviews with 6 independent experts who were familiar with the LG sector. They provided a reference point of clarification for the interpretation of the results. Phase 4 involved secondary data from documents supplied by the LG participants. These documents set out plans, programs, and policies linked to the application of 4IR technologies and workforce management programs and policies. Accessing multiple sources of information supported the triangulation of findings, enhancing research validity in line with Yin's (2018) principles of utilising multiple evidence sources.

Semi-structured interviews were conducted in phases 2 and 3 using a balanced structure that provided flexibility. This approach allowed for an in-depth exploration of complex topics while ensuring alignment with the research objectives (McIntosh & Morse, 2015; Gray, 2020; DeJonckheere & Vaughn, 2019). Interviews provided detailed open-ended insights into the workforce impacts of 4IR technologies and the subsequent HRM practices applied by LGs.

The interviews, lasting 30 to 45 minutes, were conducted online via Microsoft Teams due to the participants' geographic dispersion and schedules that were not synchronised. The structured interview protocol guided the discussions, informed by phase 1, the prior literature review, and the research objectives. Questions focused on workforce challenges and HRM responses associated with the adoption of 4IR technologies. Open-ended prompts encouraged participants to provide detailed responses (Bryman & Bell, 2011; Young et al., 2018).

The study complied with the ethical research guidelines and approval from the authors' university ethics committee. Confidentiality of the collected information was ensured by the secure storage of encrypted transcripts on a password-protected computer accessible only by the researchers. Interviews were transcribed, and participants had the opportunity to review their transcripts for accuracy. Secondary data, including council reports and policy, were analysed through NVivo.

This study interviewed a total of 24 participants: senior council officers with responsibilities for technological application and/or workforce management ($n = 18$) and LG experts with extensive experience in the sector ($n = 6$). The senior council officers included HR managers, change managers, general managers, CEOs, and functional managers in IT and HR, selected for their expertise in workforce planning and in managing the challenges of 4IR technologies (Tongco, 2007). The HR and local government experts, each with over ten years of sector experience, provided additional insights to validate and expand on the themes identified in the phase-2 interviews (Riahi et al., 2023).

Recruitment occurred in three stages. In the initial stage, emails and phone calls were directed to regional and rural LGs. Access was through contact information provided on LG websites. To extend the participant pool, information was disseminated through professional networks, and a snowball sampling technique was employed, leveraging from participant referrals (Patton, 2015). Expert participants were recruited via professional associations and LG participants.

Table 1 lists the participating LG respondents, their respective positions, and the codes they were assigned. The respondents' names were coded to protect their identity.

Table 1. Stage 1 research participant list.

Participant Code	Position	State	Council Classification	Years of Experience
Participant A	People and Culture Officer	Victoria	Regional	17
Participant B	Executive Manager Digital Transformation	New South Wales	Regional	11
Participant C	Manager, Human Resources	New South Wales	Regional	1
Participant D	People and Culture Coordinator	New South Wales	Regional	16
Participant E	Deputy General Manager	Tasmania	Regional	7
Participant F	Manager, People and Strategy	New South Wales	Rural	8
Participant G	Chief Executive Officer	South Australia	Rural	15
Participant H	Manager, People and Culture	Victoria	Regional	18
Participant I	Talent Acquisition Advisor	Victoria	Regional	20
Participant J	Organisation Design Lead	Victoria	Regional	9
Participant K	Strategic Workforce Planning Lead	Victoria	Regional	10
Participant L	Manager Customer, Information and Technology Services	South Australia	Regional	19
Participant M	People, Policy, and Planning Manager	New South Wales	Regional	14
Participant N	People and Culture Manager	New South Wales	Regional	13
Participant O	HR Business Partner	South Australia	Regional	12
Participant P	Executive Manager	Tasmania	Regional	20
Participant Q	Manager, Customer Services	Tasmania	Regional	15

Table 2 lists the experts interviewed, with applied codes to maintain confidentiality.

Table 2. Expert participant list.

Participant Code	Occupation	Industry	Experience Level
Expert A	HR Executive	Human Resources	Twenty-five years
Expert B	Workforce Development Consultant	Local Government	Twenty years
Expert C	Head of Strategy	Local Government	Thirty years
Expert D	Associate Professor, Ethical AI and Work	Human Resources	Thirty years
Expert E	Industrial Officer (Southern)	Local Government	Ten years
Expert F	Principal Project Officer	Local Government	Fourteen years

A total of 35 council documents (see Table 3) were analysed, provided by interview participants, and further documents were retrieved through searches of LG websites and media releases. This approach strengthened the research by offering a broader understanding of the HRM strategies being implemented in rural and regional councils. The document analysis helped validate the interview findings and provided further context on how LGs are addressing HRM challenges generated by the application of new technologies.

Table 3. Secondary data sources.

Document Code	Document Type	Council Code	Council Classification	State
Document 1	Community Strategy	Council A	Regional	New South Wales
Document 2	Workforce Management Plan	Council A	Regional	New South Wales
Document 3	Digital Transformation Operational Strategy	Council F	Regional	Tasmania
Document 4	Workforce Management Strategy	Council K	Regional	New South Wales
Document 5	Smart City Framework	Council H	Regional	Victoria
Document 6	Council Case Study Report	Council Q	Regional	Victoria
Document 7	Magazine	Council P	Regional	South Australia
Document 8	Smart Shire Strategy	Council P	Regional	South Australia
Document 9	Council Resource Strategy	Council P	Regional	South Australia
Document 10	Industrial Relations Policy	N/A	N/A	N/A
Document 11	Local Government State Award	N/A	N/A	New South Wales
Document 12	Workforce Management Plan	Council K	Regional	New South Wales
Document 13	Workforce Profile Report	Council M	Rural	New South Wales
Document 14	Resourcing Strategy	Council L	Regional	New South Wales
Document 15	Workforce Planning Strategy	Council P	Regional	South Australia
Document 16	Workforce Resourcing Strategy	Council N	Regional	New South Wales
Document 17	Annual Report	Council G	Rural	New South Wales
Document 18	Enterprise Agreement	Council O	Regional	Victoria
Document 19	Workforce Management Plan	Council G	Rural	New South Wales
Document 20	Workforce Plan	Council Q	Regional	Victoria
Document 21	Council Report	Council O	Regional	Victoria
Document 22	Strategic Resource Plan	Council O	Regional	Victoria
Document 23	Information Technology Strategy	Council O	Regional	Victoria
Document 24	Strategic Plan	Council J	Regional	South Australia
Document 25	Enterprise Agreement	Council Q	Regional	Victoria
Document 26	Annual Plan and Budget	Council J	Regional	South Australia
Document 27	Annual Report	Council I	Regional	New South Wales
Document 28	Position Description	Council Q	Regional	Victoria
Document 29	Resourcing Strategy	Council I	Regional	New South Wales
Document 30	Annual Plan and Budget	Council H	Regional	Victoria
Document 31	Annual Plan and Budget	Council Q	Regional	Victoria
Document 32	Annual Plan and Budget	Council A	Regional	New South Wales
Document 33	Annual Plan and Budget	Council J	Regional	South Australia
Document 34	ICT, Cyber Security and Digital Government Strategy, 2022	N/A	N/A	South Australia
Document 35	Victorian Government Digital Strategy, 2021–2026	N/A	N/A	Victoria

A thematic analysis (Braun & Clarke, 2006; Gray, 2020) was used to identify and interpret patterns in the data. The analysis was closely aligned with this study’s research objectives. Braun and Clarke’s (2006) six-step framework guided the process: (1) familiarisation with the data, (2) code generation, (3) theme identification, (4) theme review, (5) theme

definition, and (6) reporting. The thematic analysis integrated data from semi-structured interviews and secondary sources, capturing diverse perspectives on how rural and regional LGs address workforce challenges posed by 4IR technologies. NVivo facilitated coding and pattern identification within the dataset, allowing for the organisation of complex qualitative data. The researchers supplemented NVivo's automated coding with a manual data review, which allowed for closer engagement with the nuances of the data, supporting deeper insights and closer alignment with the research context.

5. Findings

What Are the HRM Challenges Linked to 4IR Technologies Facing Rural and Regional LGs?

In general, the workforce challenges associated with the introduction of 4IR technologies revolve around skill development, accessing qualified and key personnel, managing staff whose skills and occupations are redundant, and restructuring the workforce to accommodate the disruptions and opportunities associated with the 4IR (WEF, 2016). The workforce challenges associated with the application of 4IR technologies are shaped by the institutional and contextual conditions that are faced by the sector. The sector was seen as having to accommodate sector-wide challenges that included skill shortages, tight labour markets, recruitment difficulties, limited access to training, an ageing workforce, a no-forced-redundancy industrial agreement, and employee retention challenges (Australian Local Government Association [ALGA], 2022; Kergroach, 2017; Mohamed, 2018; Nokele & Makganya, 2023; Prisecaru, 2016). Addressing the workforce challenges associated with the application of 4IR technologies requires cognisance of the contextual constraints, but it also requires programs that address those constraints.

The literature, documents, and participants agreed that 4IR technologies are transforming all operational areas of the sector (Australian Local Government Association [ALGA], 2022). Every area of service delivery has been augmented by new technologies. The application and investment in new technologies differ across the sector given the diversity of contexts in which LGs operate, the differences in services they deliver, and the differences in their financial and skill capabilities (Australian Local Government Association [ALGA], 2022). Managing the impact of 4IR technologies has to accommodate the intersection of technological implementation with underlying institutional challenges, including an ageing workforce, a tight labour market, a no-redundancy industrial clause, and for rural and regional council resource constraints, flat organisational structures and staff attraction and retention challenges. In particular, limited financial capacity restricts access to and retention of staff who are familiar with the new technologies.

For rural and regional LGs, the application of 4IR technologies and its workforce impacts require meeting the challenges associated with resource limitations, locational disadvantages, recruitment and retention challenges, managing an ageing workforce, and upskilling staff.

Participant O discussed the impact of increasing demand for technical skills linked to 4IR technologies, stating, "Technical skills are in demand, driving up wages. The salaries for those jobs are increasing. . . What that means sometimes for us is that we cannot afford to hire that role compared to what they are paid in private enterprise. So, we have to find alternative ways to get the work done. This creates a skill shortage for us".

The disparity between private sector salaries and the salaries that LGs can offer hampers the ability to compete for technology-intensive positions. Participant C explained, "Council is not keeping up with the technology change, and we do not have the specialised in-house skills to do some of these technical roles. . .". This financial disparity limits councils' ability to invest in both technology and to acquire the talent required for its successful implementation.

Recruitment remains a persistent challenge for all LGs, particularly in attracting professionals with technology-related skills. The challenge is amplified by geographic isolation, limited career growth opportunities, and limited infrastructure and social resources in regional and rural areas. Participant A noted, “It’s difficult to entice younger professionals to the region when they can earn more and have better prospects in the city. We simply can’t match the salary and career progression opportunities available in larger cities”.

Participant D described the struggle to compete for professional and skilled staff with state governments and the private sector, where higher salaries and greater funding are available. Other participants highlighted the reluctance of skilled professionals to relocate to rural areas, emphasising that this was a significant barrier to attracting qualified staff. Document 9 outlined the challenges that regional and rural LGs face in attracting qualified applicants for critical roles, such as IT staff, recreation planners, and construction coordinators.

LGs face challenges in providing adequate training and upskilling opportunities to help employees adapt to technological change. Budget constraints and limited access to specialised education and training institutions, particularly in rural areas, place limitations on workforce skill development. A key challenge is enhancing employees’ digital skills to ensure the effective use of new systems. Participant I noted, “Not everyone is literate regarding technology”, highlighting the variability in staff members’ technological proficiency.

Participant C raised concerns about this issue, stating, “We still have a big gap in understanding how people are using the systems effectively and updating their processes so that they can use these new systems to the best of their capabilities”. Geographic separation between staff members, especially across rural areas, reduces the inclusivity of digital literacy initiatives. Participant H observed, “Not all staff members are in the same building; local councils have several outdoor staff members. It becomes challenging to keep all staff members in the loop of the ongoing changes and to support them during the change”.

An ageing workforce presents a significant challenge for rural and regional LGs, particularly in adapting to 4IR technologies. The participants highlighted that ageing demographics create HR challenges as many employees approach retirement. The participants noted that older employees often struggle to acquire the skills necessary to operate technologically advanced systems, as these technologies differ significantly from the processes they have relied on in the past. Participant A observed, “Older staff members often find it difficult to transition to new technologies because the systems are so different from what they have been using for years”. This is further compounded by a reluctance of some older employees to embrace new technologies, particularly as they near retirement. Participant K explained, “For many older employees, there is a hesitance to fully engage with new technologies because they feel that they will not be in the workforce long enough to benefit from learning them”.

The retention of skilled employees remains a persistent challenge for rural and regional LGs, particularly as staff with high-demand skills seek better opportunities elsewhere. The lack of clear career progression pathways, given that regional and rural LGs have flat organisational structures, combined with the geographic isolation of regional areas, exacerbates turnover rates, disrupting workforce continuity and hindering the implementation of new technology. Participant G commented, “The absence of clear career progression and the isolation of regional areas make it difficult to retain skilled staff, especially when they have opportunities elsewhere”. Rural and regional LGs struggle to offer the same professional development and career advancement opportunities as metropolitan LGs ([Australian Local Government Association \[ALGA\], 2022](#)). This gap is critical in the context of 4IR workforce and skill transformation, where continuous learning and adaptability are essential ([Bozarth & Striffler, 2019](#)).

These findings underscore the complexity of managing HR challenges linked to technological change in rural and regional local councils. Addressing these issues requires targeted strategies to attract, develop, and retain talent, while ensuring employees can navigate the evolving technological landscape.

6. What Innovative HRM Strategies Are Rural and Regional LGs Employing to Manage the Workforce Impacts of 4IR Technologies?

The application of 4IR technologies drive innovative HRM practices that in turn are shaped by the contextual conditions faced by rural and regional LGs (Cooke, 2018). The following discussion identifies a range of strategies that attempt to overcome the contextual challenges faced by LGs in rural and regional areas. Central HRM strategies such as recruitment, retention, training, and succession planning are discussed. The discussion identifies recruitment strategies, upskilling and training, succession planning, internally generated programs, secondments, and resource sharing. LGs have applied HRM solutions that recognise the organisational limitations and constraints. These solutions include the use of internal resources and programs (mentoring, coaching, redeployment, and succession development) to address the challenges without incurring significant costs; flexible working and online processes to support staff training, accreditation, online working, accessing consultants, and professional staff; and networking and sharing across LGs, including staff secondments, sharing specialist professionals, and service delivery sharing. The HRM services and programs identified in the following discussion were not necessarily present across all the included LGs, but they are indicative of how the workforce challenges associated with 4IR technologies could accommodate the contextual challenges faced by regional and rural LGs. The HRM practices implemented follow.

6.1. Recruitment

Enhanced recruitment practices emerged as a vital HRM strategy in regional and rural LGs, particularly in the face of geographic constraints and skill shortages. Recruitment strategies included proactive and flexible approaches, addressing workforce shortages and resource constraints. Document 2 reveal a council's recruitment strategy prioritising flexibility and diversity to address an ageing workforce and skill shortages. Participant N noted how flexible work arrangements such as part-time and online working promote work-life balance, making the council attractive to potential employees and retaining older skilled workers.

Workforce development is a key strategy for rural and regional LGs to address the challenges of skill shortages, limited training resources, and workforce challenges associated with the application of 4IR technologies. As Participant C noted, "In small and rural councils, we don't have the luxury of extensive budgets for training programs. Workforce development is about being strategic and focusing on upskilling our current employees to meet future demands while addressing immediate skills gaps". This statement underscores the necessity to strategically focus on upskilling their existing workforce given recruitment and budgetary constraints.

6.2. Succession Planning

Succession planning is crucial for rural and regional LGs as they navigate the workforce challenges posed by an ageing workforce, skill shortages, a tight labour market, and the technological disruption associated with the 4IR. The ageing workforce supports proactive succession strategies to safeguard institutional knowledge while preparing the workforce for 4IR-related demands (Document 10). Participant L stated, "With so many of our staff nearing retirement, it is critical that we have a succession plan in place to

pass on their knowledge and skills. Otherwise, we risk losing not just the people, but the years of experience they bring to the table". Succession planning is about preparing a workforce that can adapt to advanced technologies while retaining institutional expertise. Expert C noted the dual challenges of addressing retirements and equipping staff for technological transitions.

6.3. *Mentoring and Coaching*

Mentoring and coaching emerged as critical strategies for addressing workforce challenges posed by the 4IR in rural and regional LGs. By pairing experienced employees with less experienced colleagues, LGs ensure the effective transfer of knowledge, enhance problem-solving capabilities, and promote continuous learning. Participant L stated, "Mentoring is vital for us, especially in a small council with limited resources. . . By pairing our experienced staff with newer employees, we can pass on valuable skills and build a strong sense of community and teamwork. This approach ensures that everyone has the support they need to grow and contribute effectively to our goals". This illustrates how mentoring and coaching address resource constraints while strengthening workforce adaptability.

Coaching enhances managerial skills and complements mentoring by promoting continuous improvement in feedback and performance management processes. Document 33 points out that coaching programs provide supervisors and managers with ongoing support, ensuring they can lead effectively in a rapidly changing environment.

6.4. *Secondments*

Secondments have emerged as a pivotal workforce development strategy for rural and regional councils to address the challenges posed by the 4IR. By temporarily transferring employees to different roles or departments within or outside the organisation, secondments provide valuable opportunities for skill enhancement and adaptability. For small and rural councils, secondments primarily occur within the organisation, reflecting resource constraints and the need to retain institutional knowledge. Participant L remarked, "Within our council, secondments are usually internal, allowing employees to develop new skills while staying familiar with our operational environment". This highlights the cost effectiveness of secondments in promoting upskilling and reskilling, particularly in councils constrained by limited training budgets. Participant P added, "Secondments are an excellent way for our staff to expand their skills without the need for external training programs. It is a cost-effective way to give them exposure to different roles within the council, which helps their professional growth and brings fresh ideas and approaches back to our team. It is a win-win for everyone".

7. **Redeployment**

Redeployment emerged as a critical workforce development strategy for rural and regional councils. This strategy facilitates the permanent or semi-permanent transition of employees into new roles within the organisation, helping councils adapt to technological advancements, address skill gaps, and sustain workforce stability. Unlike secondments, redeployment does not return employees to their original positions but focuses on reallocating talent to meet organisational demands (Sabel & Sasson, 2023).

In the context of rural councils, where resources are limited, redeployment offers a cost-effective solution for workforce retention. Document 33 highlights a state-wide policy that mandates councils to prioritise redeployment in cases of redundancy, ensuring workforce stability and continuity. Participant Q stated, "If a role were to become redundant, our first step would be to explore redeployment options". This approach underscores a proactive stance in managing workforce transitions and retaining experienced staff. Redeployment

also enhances organisational flexibility by enabling employees to acquire new skills and adapt to evolving needs. Participant N described a comprehensive redeployment process within their council, which involves regular engagement with employees affected by workforce changes and matching their skills with suitable roles. This structured approach serves as an employee retention strategy and ensures alignment between organisational requirements and individual capabilities.

7.1. Traineeships

Traineeship and apprenticeship programs are increasingly being adopted by rural and regional councils as innovative strategies to address critical skill shortages and develop future-ready talent. These initiatives are particularly significant in the context of the workforce disruptions associated with 4IR technologies.

Participant P highlighted that transitioning to technology-driven work processes necessitates a younger, digitally literate workforce while ensuring the retention of critical institutional knowledge. Participant D added, “Traineeships provide structured pathways for equipping employees with these essential skills, addressing current deficits while laying a foundation for sustainable workforce development”. These insights align with [Australian Local Government Association \[ALGA\] \(2022\)](#), which emphasises the role of structured development programs in bridging skill gaps and preparing a resilient workforce for future challenges.

7.2. Training and Development

Training and development are vital in rural and regional councils, particularly to address workforce challenges intensified by the 4IR. With limited resources and the need for skill adaptability, these councils are tailoring their programs to meet specific employee needs. Expert D highlighted this necessity, noting, “Training is critical, but there is no one-size-fits-all approach. The best method depends on the context, including the team’s expertise and hierarchy. These factors vary greatly, so a strategy that works for one team may not be relevant for another. Additionally, the extent to which the team will use the technology affects the training approach. Therefore, organisations need to ask specific questions. . . Given our context, what do we need our people to know about using this technology? How do we design a skilling or training program that helps them reach the necessary skill level?” This perspective underscores the importance of tailoring training to team dynamics and technological requirements, ensuring councils can effectively navigate the 4IR challenges.

Documented strategies across councils reveal a proactive approach to addressing workforce development. For example, Document 29 highlights how a rural council expands training opportunities to enhance staff performance and retention. Similarly, Document 35 illustrates a broader training strategy designed to equip employees with essential skills, contributing to workforce adaptability. These initiatives are aligned with the research of [Sriganesh and Ramjee \(2018\)](#) and [Li \(2022\)](#), who stress the value of continuous skill development in preparing employees for the shifts brought on by new technologies.

7.3. Resource Sharing

Resource sharing (or shared services) involves collaboration between neighbouring councils to pool resources and reduce costs. This can include outsourcing services like waste collection or libraries and consolidating back-office functions such as human resources, payroll, or procurement ([Tasmanian Policy Exchange, 2022](#)). Many councils already engage in shared services, particularly in procurement and external service delivery, with substantial potential for growth in these areas to achieve significant cost savings and operational benefits ([Victorian Government, 2014](#)). Resource sharing, especially through shared

services, addresses workforce challenges in rural and regional councils, which often face resource constraints and skill shortages. By collaborating with neighbouring councils and regional entities, these councils can pool resources and expertise to achieve operational efficiencies. Shared services enable rural councils to optimise limited resources, addressing both resource constraints and the technological demands of the 4IR.

The participants highlighted that rural councils often struggle to fill full-time specialist roles due to limited workloads. By partnering with neighbouring councils, they can share costs and attract skilled professionals who might otherwise overlook rural opportunities. This strategy addresses staffing gaps while enabling councils to access expertise that may be unavailable due to resource constraints. Such efforts align with [Paagman et al. \(2015\)](#), who emphasised the role of collaborative approaches in optimising resources and adapting to technological and workforce demands. Resource sharing extends beyond individual roles to include broader operational functions like IT, HR, and administrative tasks. As noted by Participant D, these arrangements improve efficiency and reduce costs, helping councils overcome the financial and technological barriers of 4IR innovations. Participant G emphasised, “Collaboration helps smaller councils keep pace with technological change. It is not just about cost savings. . . It is about survival in a competitive environment”. This highlights the importance of shared services in ensuring that councils remain operationally viable and technologically adaptive.

7.4. Multitasking

Workforce shortages in rural and regional councils have led to the adoption of multitasking and multiskilling strategies, where employees take on a broader range of responsibilities across various roles. This approach is crucial for maintaining operational efficiency and service delivery, particularly when staffing resources are limited. Employees are increasingly performing tasks traditionally handled by specialised roles, ensuring that councils remain functional despite workforce constraints. As Participant J highlighted, “At the council, we often find ourselves wearing multiple hats, stepping into roles that were once specialised. . . It is not just about getting things done, it is about maintaining service delivery and staying responsive with fewer resources”.

8. Discussion

The findings indicate that rural and regional LGs demonstrate resourcefulness in addressing workforce challenges associated with implementing 4IR technologies. Contextual and institutional conditions ([Cooke, 2018](#)), combined with 4IR technologies, constrain HRM choices while fostering innovative solutions. A notable feature of the identified HRM programs is their reliance on low-cost solutions, reflecting the resource constraints faced by rural and regional LGs. Many initiatives, such as mentoring, succession planning, coaching, and multitasking, are funded and organised internally. These in-house efforts not only reduce costs but also leverage organisational resources to support training, skill development, and operational resilience.

Fourth Industrial Revolution technologies play a dual role, both disrupting and enhancing HRM processes. They enable solutions such as online training, remote working arrangements, access to specialist skills, and recruitment support, helping LGs address workforce challenges more effectively. Additionally, resource sharing across councils, including secondments, job sharing, and service sharing, provides a collaborative approach to overcoming workforce limitations. For LGs lacking specialist divisions like HRM, these practices, alongside the use of external consultants, help bridge gaps. This study suggests that innovative HRM solutions are possible to address technological-driven workforce

restructuring even where organisations are small, have limited resources, and are not driven by profit outcomes.

Another significant finding is the emphasis on redeployment and reskilling rather than redundancy, driven by industrial agreements governing workforce management under structural changes. While this approach limits HRM choices, it offers advantages in preserving organisational knowledge and addressing recruitment challenges.

9. Implications

Not all the above HR programs are applied across the LGs included in the study, but they are illustrative of the options available to rural and regional LGs in addressing the workforce challenges arising from the application of 4IR technologies. This exploratory study suggests that rural and regional LGs have developed a suite of HRM programs to address the workforce management challenges arising from the introduction of 4IR technologies. These findings are suggestive for small organisations and NGOs with limited financial capacity and a limited ability to compete for and recruit specialist staff in the context of a tight labour market.

In terms of theoretical implications, this study highlights the importance of contextualizing HRM and understanding the institutions that shape the choices and application of HRM programs (Cooke, 2018; Gooderham et al., 2018). This study examines small not-for-profit organisations with resource and skill constraints. This extends the literature beyond large and for-profit organisations. There is no one-size-fits-all set of HRM programs for dealing with the workforce challenges associated with the application of new technologies; the recognition of contextual conditions and constraints shapes the HRM programs, as they did in the Australian LG sector.

The study informs HR managers by equipping them with evidence-based strategies to prepare their workforce for the future. Finally, while focused on rural and regional local governments, the findings extend to larger metropolitan local governments and other not-for-profit sectors facing similar constraints, providing a broader understanding of how such organisations can navigate workforce challenges in the 4IR era.

This study also highlights the pressing need for innovative HRM strategies in tight labour markets as a response to technological disruption. It provides valuable insights into how councils are adapting through low-cost, innovative approaches, such as upskilling initiatives and strategic workforce planning, to address challenges like an ageing workforce and organisational knowledge loss through staff retirement.

10. Limitations

The study was limited to a selection of LGs across four Australian states. As such, the findings are exploratory and not representative. A more complete picture of the sector would require a larger sample and the inclusion of metropolitan LGs to provide a comparator for the HRM practices of regional and rural LGs. This study was conducted at one point in time, and the nature of the research requires an analysis of the implementation and impacts of 4IR technologies over a period. The key informants were senior managers within the LG sector, and their biases are towards the acceptance of the applied HRM programs that in part they were responsible for. Input from employees is required to assess the impact of the technologies and supporting HRM programs on job satisfaction, job quality, commitment, and organisational attachment.

11. Further Research

There is scope to extend the study across the LG sector to incorporate additional states and metropolitan LGs. Stakeholder participation could be extended to include employees

and elected council officials. A longitudinal analysis that tracks specific technological changes and their impact on the workforce would be instructive. A cross-government and international comparative analysis would provide insights into the impact of institutional and contextual conditions on the application of HRM programs.

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