

Review Article

The Human Factor in HR 5.0: Technological Innovation, Workforce Adaptability, and Cognitive Balance in Developing Economies

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Human Resource Management 5.0 (HR 5.0) promises to make human resource management more human-centered through artificial intelligence, analytics, automation, and human-technology collaboration. Yet in resource-constrained economies, unreliable electricity and connectivity, high data costs, uneven digital skills, and economic pressures may turn technologies intended to support employees into additional sources of workload and technostress. This paper synthesizes literature on HR 5.0, workforce adaptability, cognitive demands, and employee well-being, using Zimbabwe as a focal context for developing a conceptual framework relevant to comparable developing economies. A structured literature review identified 254 records; after screening and eligibility assessment, 39 studies were included in the qualitative synthesis. The synthesis identified five key findings: economic and institutional uncertainty can heighten the risks associated with unsupported technological change; inadequate infrastructure can transform technological resources into cognitive liabilities; Ubuntu-informed practices may strengthen social resources and support employees during technological transitions; workforce adaptability is central to the successful implementation of HR 5.0; and cognitive balance emerges as a promising but insufficiently operationalised construct requiring further conceptual and empirical validation. Drawing on the Job Demands-Resources model, Cognitive Load Theory, and Ubuntu philosophy, the paper proposes a framework in which HR 5.0 practices may support workforce adaptability and cognitive balance, contributing to employee well-being and organizational outcomes. Cognitive balance is advanced as a conceptual construct requiring further operationalization and empirical testing, not as an established or empirically validated measure. The framework's contribution lies in connecting human-centric technology implementation with cognitive sustainability and context-sensitive social resources. Practical implications include inclusive

co-design, accessible training, reliable infrastructure, manageable digital workloads, and peer support.

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1. Introduction

Human Resource Management 5.0 (HR 5.0) refers here to a human-centered approach to managing work that combines digital technologies including artificial intelligence (AI), the Internet of Things (IoT), robotics, cloud computing, digital platforms, and people analytics with attention to employee well-being, adaptability, sustainability, and human-technology collaboration^[1]. This framing draws on Industry 5.0's emphasis on human-centricity, sustainability, and resilience, in contrast with accounts of digital transformation that privilege automation and efficiency without sufficiently considering the human consequences^{[2][3]}.

The conditions under which HR 5.0 is implemented differ across organizations and countries. In Zimbabwe, the literature identifies constraints including unreliable electricity, uneven connectivity, high data and technology costs, digital-skills gaps, and economic uncertainty^{[4][5]}. These conditions should not be treated as universal characteristics of every Zimbabwean workplace. Rather, they are contextual factors that may increase the effort required to use digital systems. The wider African digital-inclusion literature also emphasizes that access, affordability, and capability shape who benefits from digital transformation^[6].

Digital technologies may improve information access, coordination, decision-making, and routine task completion. Yet when implementation is accompanied by poor system usability, connectivity interruptions, inadequate support, intensified monitoring, or expectations of constant availability, the same technologies may add job demands and contribute to technostress or cognitive strain^[7]. HR 5.0 therefore cannot resolve technology-related problems simply by introducing more technology. Its human-centered promise depends on the design and governance of implementation. Adequate training, employee participation, usable systems, manageable workloads, support, and infrastructure must accompany technological investment.

The specific gap addressed in this paper is not a demonstrated absence of all HR 5.0 studies in developing economies. Rather, the literature considered here gives less attention to how infrastructure constraints

and socio-cultural resources may shape the relationship between HR 5.0 practices, workforce adaptability, and employees' ability to manage cognitive demands. Existing human-centered technology frameworks provide a useful starting point, but they do not by themselves specify how cognitive demands should be considered in resource-constrained work settings or how context-sensitive social resources might be incorporated into HR practice.

The paper addresses this gap by synthesizing literature on HR 5.0, workforce adaptability, technostress, cognitive load, and employee well-being, and by developing a framework for future empirical testing. The Job Demands-Resources (JD-R) model is used to distinguish technology-related demands from resources that may support motivation and well-being of employees^[8]. Cognitive Load Theory (CLT) helps explain how task complexity and avoidable system burdens can consume limited working-memory capacity. Ubuntu is considered as a socio-cultural resource that may inform collective learning, mutual support, and shared responsibility, not as a proven mediator or a mechanism already established by the review.

These theoretical lenses help frame a central tension: digital tools may enhance employees' capabilities while also increasing the speed, complexity, and cognitive demands of work. The tension is especially relevant where employees must navigate unreliable systems or limited access to training and support. The review does not establish that these conditions affect all organizations equally, nor does it test the causal effects of HR 5.0. Instead, it synthesizes reported relationships and develops propositions that can be tested in subsequent studies.

The study's primary contribution is a context-sensitive conceptual framework that places cognitive balance, a construct referring to the ability to maintain workable attention and mental functioning when technological demands are matched by individual, social, and organizational resources between workforce adaptability and employee or organizational outcomes. The framework also identifies infrastructure and Ubuntu-informed social resources as contextual conditions that may shape implementation. Zimbabwe provides the focal context and the framework's more general elements may be relevant elsewhere, but their applicability should be examined rather than assumed.

Accordingly, the paper first presents the conceptual framework, then explains its theoretical foundations and reviews the relevant literature. It next describes the review method and the limits of the available literature, presents the themes identified in the synthesis, and discusses their implications for research, practice, and policy.

1.1. Study Objectives

The review is guided by the following objectives:

- synthesize literature on HR 5.0 and workforce adaptability in Zimbabwe and comparable developing-economy settings;
- examine how existing studies describe technological and infrastructural demands in relation to technostress, cognitive load, and employee well-being;
- identify the job resources and socio-cultural practices discussed in the literature as potentially supporting adaptability and cognitive balance; and
- develop a context-sensitive conceptual framework and propositions that can be tested in future empirical studies.

2. Conceptual Framework

The conceptual framework translates the literature synthesis and theoretical lenses into propositions for future testing. It is not an empirically validated causal model. Zimbabwe is used as the focal context to illustrate how infrastructure, affordability, skills, and socio-cultural conditions may shape HR 5.0 implementation. The broader applicability of the framework requires context-specific evaluation.

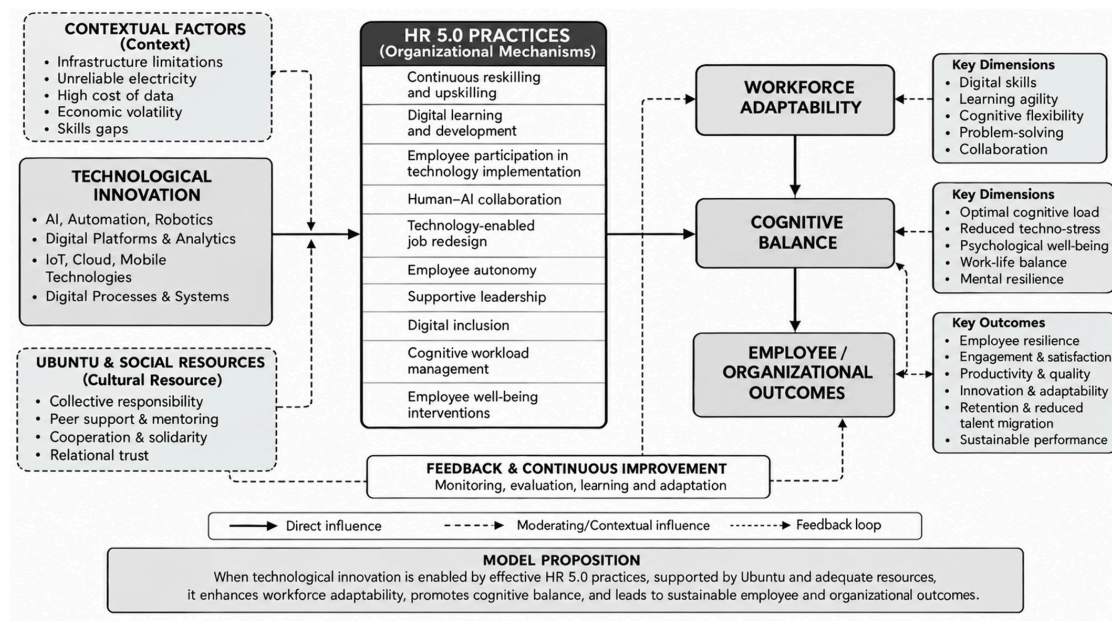


Figure 1. Conceptual Framework. Source: Developed by Researcher

The theoretical framework aligns with the overarching HR 5.0 and Industry 5.0 models, which transcends mere technical efficiency to emphasize human-centricity, employee welfare, empowerment, and resilience. The approach regards technical innovation as the initial phase rather than the final goal of change.

Technologies including artificial intelligence, automation, robotics, digital platforms, analytics, cloud computing, and the IoT present opportunities for enhanced productivity and organizational efficiency^[9]. However, their influence is contingent upon how organizations address the human implications of technological transformation. This is especially pertinent to developing economies, where the integration of technology takes place in contexts marked by infrastructure deficiencies, inconsistent electricity supply, high data costs, economic instability, and ongoing talent shortages. The literature presented for the paper also recognizes infrastructure, cost, accessibility, and digital proficiency as significant limitations, while highlighting that technological advancements may not inherently yield organizational advantages^[5]. The model situates HR 5.0 practices at the intersection of technical innovation and human outcomes, framing HR as the organizational tools that transforms technological advancements into human potential and sustainable performance.

The proposed pathway is: technological innovation → HR 5.0 practices → workforce adaptability → cognitive balance → employee and organizational outcomes. This sequence is a conceptual proposition rather than a causal effect established by the review. HR 5.0 practices include continuing reskilling and upskilling, employee involvement in technology deployment, human-AI collaboration, accessible digital learning, inclusive job redesign, workload monitoring, and employee well-being support. The JD-R model supports the distinction between technology-related demands and resources. CLT explains how avoidable process complexity may add cognitive burden. Ubuntu suggests that peer support and collective learning may strengthen social resources. Existing literature provides a rationale for these components, but direct tests of the full pathway especially the cognitive-balance construct in Zimbabwe remain limited.

The framework also proposes a feedback loop. Employee reports of overload, repeated workarounds, errors, fatigue, or low adoption should be treated as signals for organizational review rather than as evidence of individual failure. Organizations can use these signals to redesign workflows, simplify interfaces, revise workload expectations, improve infrastructure and support, and adapt training. Ubuntu-informed consultation can help ensure that changes are developed with employees and that

peer-learning practices evolve as technologies and work roles change. These feedback processes are propositions for implementation and require evaluation in practice.

The framework's Zimbabwe-specific contextual conditions include electricity interruptions, connectivity and data affordability, uneven access to digital skills, and economic constraints discussed in the reviewed literature. More transferable elements include human-centered design, continuing learning, manageable workloads, employee participation, and supportive leadership. The relative importance of each condition will differ across sectors and countries. Application beyond Zimbabwe should therefore be contextually adapted rather than assumed to be universal.

This is especially significant since digital transformation alters not only the technologies utilized by employees but also the skills, responsibilities, workflows, and expectations linked to their positions. The literature suggests that organizations in Zimbabwe encounter a deficiency in digital skills on the supply side, and that swift technology advancements necessitate ongoing skills enhancement for employees^[10]^[5]. As a result, employee adaptability emerges as the primary human outcome of successful HR 5.0 implementation. It includes digital proficiency, learning adaptability, cognitive versatility, problem-solving abilities, and teamwork, thus, broadening the notion of adaptability beyond just technical capabilities.

This aligns with the Industry 5.0 viewpoint that technological frameworks should integrate sophisticated technologies with human skills and innovative potential instead of attempting to replace human labor with technology. The framework further suggests that people who obtain suitable growth, engagement, independence, and organizational backing are more equipped to adjust to evolving technological demands. Crucially, flexibility is not regarded as the ultimate human result. The model presents cognitive balance as a secondary human factor, whereby employees can effectively gain new abilities while concurrently facing heightened information density, technological intricacy, connectivity, and responsiveness requirements. The literature distinctly recognizes this dual impact of technology. It can enhance employees' talents while simultaneously enhancing cognitive demands^[11].

Cognitive balance is thus, the theoretical input of the model. It encompasses the ability of employees to sustain peak cognitive performance, tolerable cognitive demands, psychological health, work-life equilibrium, and mental fortitude while functioning in technology-driven workplaces. The framework suggests that workforce adaptability enhances cognitive balance, as employees with heightened learning agility, problem-solving skills, and technical confidence are likely to navigate technological challenges more effectively. Nonetheless, the association should not be viewed as inherent. High technology

requirements, insufficient training, sub-optimal work design, or inadequate organizational support may disrupt cognitive balance even among skilled employees^[12].

This positions mental workload management, employee autonomy, supportive leadership, and wellness interventions as essential elements of HR 5.0 instead of marginal HR functions. The ultimate route, cognitive balance → employee/organizational results link the human experience of technological change to outcomes including employee resilience, engagement and satisfaction, productivity and quality, innovation and adaptability, retention and reduced talent migration, as well as sustainable performance. This reasoning embodies the core principle of Industry 5.0, which postulates that technological advancements should primarily provide value for individuals and communities instead of solely focusing on production and profitability^[13]. The model additionally integrates ambient elements and social assets as determinants that influence these connections.

Infrastructure, electricity, data costs, economic conditions, and the availability of skills may hinder the use of technology^[10], but shared accountability, mutual assistance, collaboration, solidarity, and relational trust can enhance employees' ability to adapt. In a study centered on developing economies, this contextual aspect is crucial as the human impacts of technological advancements are influenced by the institutional and resource models within which technology is deployed. The model, thus, enhances the study from a basic technology-performance correlation to a more intricate pathway involving technology, HR practices, adaptation, cognitive balance, and sustainable outcomes, positioning the human element as the primary explanatory factor of HR 5.0. The next section discusses the theoretical framework that underpins this paper.

3. Methodology

This study used a structured systematic literature review to examine HR 5.0, technological innovation, workforce adaptability, technostress, cognitive load, cognitive balance, and resilience. The databases searched were Scopus, ScienceDirect, Web of Science, ProQuest, EBSCOhost, AJOL, and Google Scholar. The review record supplied for revision does not preserve the exact date on which each database was searched, the database-specific export files, or the original complete search strings. Thus, those details cannot be reconstructed reliably and are acknowledged as a reproducibility limitation. They are not retrospectively presented as verified historical records. For transparency, the search logic is summarised below as a reproducible set of concept combinations that should be rerun and logged before the review is represented as fully reproducible: ("HR 5.0" OR "Industry 5.0" OR "digital transformation" OR

"technological innovation") AND ("workforce adaptability" OR reskilling OR upskilling OR resilience)
AND (technostress OR "cognitive load" OR burnout OR "employee well-being").

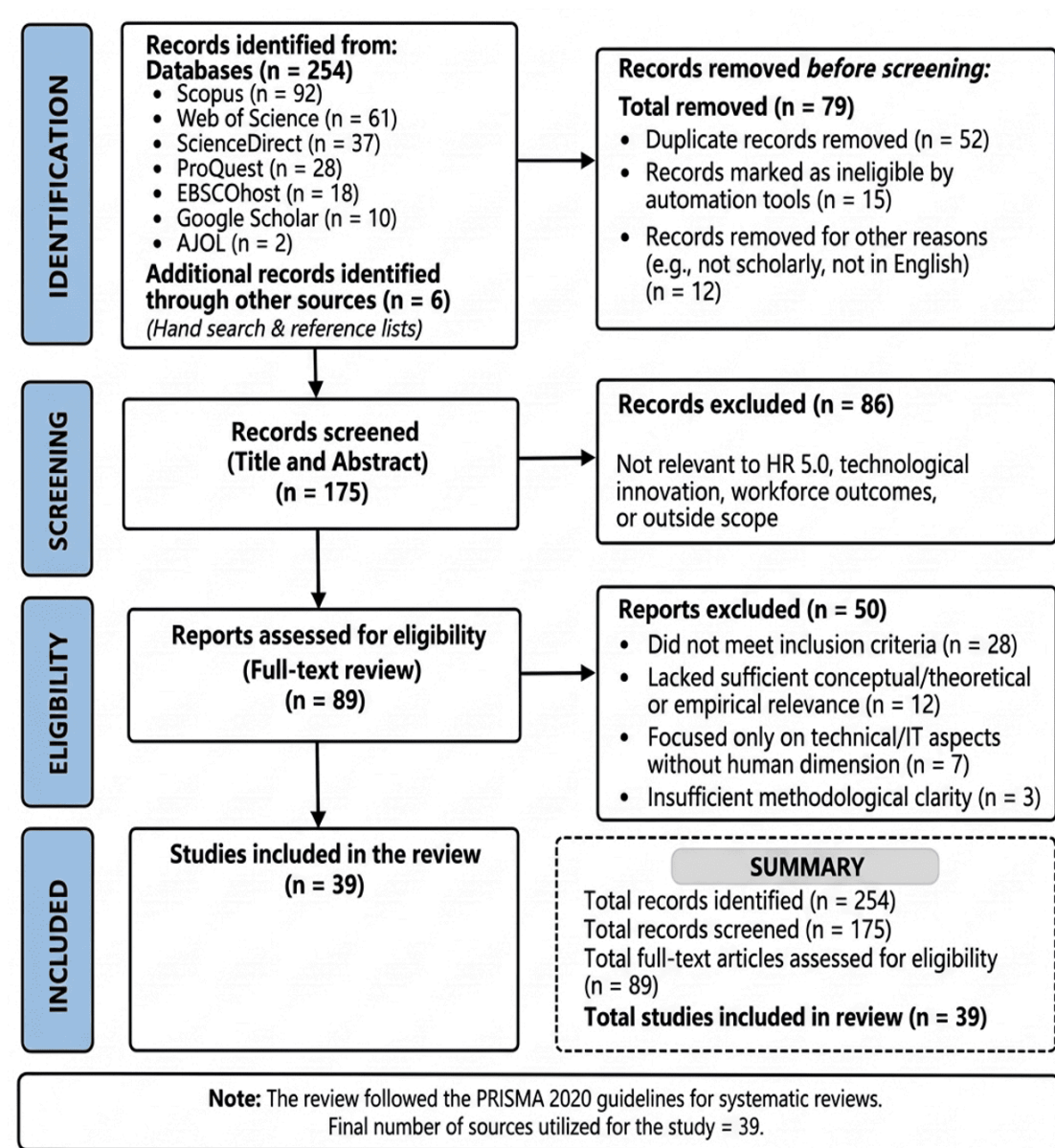


Figure 2. The PRISMA 2020 Flow Diagram

Context terms (Zimbabwe OR Africa OR "developing economies" OR "resource-constrained") were used to refine or supplement searches where supported by database functionality. The reported publication window was 2015-2026, with earlier seminal theoretical works retained when relevant. Searches were

limited to English-language materials available as full text where eligibility could be assessed. The original search log does not document database-specific filter settings.

The reported screening flow began with 254 records (see Figure 2). The original review notes that 79 records were removed before title/abstract screening, but it combines duplicates and other ineligible records and does not preserve a separate count for each category. The remaining 175 records were screened by title and abstract. Eighty-six (86) were excluded, leaving 89 records for full-text eligibility assessment. Fifty (50) full-text records were excluded, leaving 39 studies for qualitative synthesis. The supplied records do not preserve a verified breakdown of the 79 early removals or the 50 full-text exclusions by reason. These counts are therefore reported as recorded, without inventing reason-specific totals. A future rerun should export each database result, deduplicate using reference-management software, retain a decision log for each exclusion, and update the flow diagram from those logs.

3.1. Data Extraction and Analysis

A structured review matrix was used to extract each included study's context, theoretical framework, design, technology focus, job demands and resources, adaptability, technostress, cognitive load, employee well-being, and relevance to the proposed framework. The 39 sources were synthesised qualitatively. No statistical pooling or meta-analysis was undertaken because the included material was heterogeneous in context, design, and outcome. The available review record does not document an independent second coder or inter-coder reliability statistic. The synthesis should therefore be understood as an author-led thematic synthesis, rather than a dual-coded review. Themes were compared across sources for convergence, divergence, and gaps. Claims in the conceptual model are identified as propositions where the reviewed literature does not directly test the relationship.

3.2. Inclusion and Exclusion Criteria

Eligibility criteria were applied to the available records. Because the original screening log is not available, the criteria below describe the eligibility rules reported in the manuscript. The exact reason-by-reason count for full-text exclusions cannot be independently reconstructed from the supplied files.

Inclusion Criteria:

- peer-reviewed journal articles and academic books and official institutional reports;
- studies addressing HR 5.0, Industry 5.0, digital transformation and related technologies;

- studies examining workforce adaptability, employee well-being, technostress, burnout, cognitive load or resilience; and
- studies addressing job demands, job resources, employee support or related JD-R constructs.

Exclusion Criteria:

- informal blogs, editorial articles, and marketing content;
- studies not pertaining to work-related technology or human resources management;
- studies concentrating solely on technical systems devoid of a human or labor component; and
- publications devoid of adequate conceptual or methodological details.

3.3. *Data Analysis and Synthesis*

The analysis followed a transparent, author-led thematic synthesis. First, each included source was read for its context, design, technology focus, and reported employee or organizational outcomes. Second, relevant findings were coded against the review questions, including technological job demands, job resources, adaptability, cognitive strain, well-being, and socio-cultural support. Third, related codes were grouped into themes, and similarities, differences, tensions, and under-researched relationships were compared across sources. No formal CASP, AMSTAR, or equivalent critical-appraisal score is documented in the available review record. Accordingly, the paper does not claim that a formal quality appraisal was completed. This is a limitation because paper quality may affect the strength of the synthesis. The proposed relationships are treated as theory-informed propositions rather than causal effects demonstrated by this review.

3.4. *Ethical Considerations*

Because the chapter relied on secondary literature and public official reports, it did not involve direct human participants, personal data gathering, or experimental intervention. Nevertheless, academic integrity was maintained through accurate citations, transparent reporting of the search and the selection process, accurate representation of author's arguments, and avoidance of plagiarism or selective misrepresentation of findings.

4. Theoretical Framework

The theoretical framework of this paper integrates the Job Demands-Resources (JD-R) model and Cognitive Load Theory (CLT), with Ubuntu used as a socio-cultural and contextual resource rather than as a mediator. JD-R explains how demands and resources relate to strain and motivation. CLT helps explain how task complexity and avoidable interface or process burdens consume limited working-memory capacity. Ubuntu foregrounds relational solidarity, mutual support, and collective responsibility. Together, these three perspectives inform a context-sensitive conceptual framework for HR 5.0 in Zimbabwe and comparable settings. The integration itself is not claimed to validate a new causal theory. The proposed novelty is the explicit placement of cognitive balance between adaptability and outcomes, and the treatment of infrastructure and Ubuntu-informed social resources as contextual conditions that may shape the pathways.

4.1. *The Job Demands-Resources Model*

The JD-R model offers a suitable theoretical basis for analyzing the human implications of HR 5.0. The model suggests that the interplay between job demands and job resources affects employee well-being and performance. Job demands pertain to the physical, psychological, social, or organizational elements of employment that necessitate continuous bodily or mental effort, incurring physiological or psychological costs. Job resources are elements of employment that assist in achieving work objectives, alleviate job pressures and their related costs, or promote employee learning, growth, and motivation^[11].

In HR 5.0, technological advancements can serve as both a job resource that improves employee capability and organizational effectiveness, and as a job demand that increases cognitive and psychological strain^[14]. Technologies such as AI, automation, digital platforms, analytics, and cloud computing can improve efficiency, information accessibility, decision-making, and adaptability. However, their implementation may also create additional demands due to technological intricacies, lack of capacity in employees, limited connectivity, heightened work intensity, system disruptions, and the need for continuing adaptation to evolving digital settings.

As noted by the European Commission^[15], these requirements may be especially evident in developing economies like Zimbabwe, where technological advancement often coincides with infrastructure and economic limitations. Erratic electrical supply, fluctuating internet access, exorbitant data costs, limited availability of digital technologies, and a deficiency in digital competencies can elevate the effort needed

to utilize technology efficiently. As a result, a technology system that typically serves as a job resource may, in situations of limited resources, transform into an extra cause of cognitive and psychological strain.

In contrast, the advancement of digital competencies, institutional backing, technical frameworks, and nurturing organizational cultures represent significant job resources in HR 5.0. Training and reskilling can improve employees' technological proficiency and self-assurance, alleviating the cognitive burdens linked to new technology^[16]. Support from management, independence, sufficient technical support, dependable connectivity, power backup, and the organizational supply of data or digital assets can alleviate technology-related stress and enhance successful technology use.

The approach additionally establishes a foundation for integrating Ubuntu as a socio-cultural employment asset. Ubuntu's focus on mutual assistance, shared accountability, teamwork, interpersonal connections, and solidarity has the potential to enhance the social resources accessible to employees facing technological challenges^[17]. Instead of viewing adaptation to technological change as merely an individual obligation, an Ubuntu-centric perspective acknowledges that the ability of employees to adjust can be enhanced through collaborative organizational connections and mutual accountability.

Crucially, workforce flexibility and cognitive balance broaden the utilization of the JD-R model in the current study. Workforce adaptability refers to an employee's ability to learn new skills, adapt to shifting technological demands, and respond proficiently to changing work environments^[18]. Cognitive balance represents the ability to handle technology requirements within one's cognitive resources without incurring significant mental overload or prolonged psychological stress. Thus, in situations where technical requirements are elevated but employment and personal resources are insufficient, cognitive stress may escalate and compromise flexibility and well-being. When sufficient resources are accessible, employees might be more equipped to adjust to technological transformation while preserving their cognitive and psychological health.

The JD-R model endorses the primary assertion of this research that the human consequences of HR 5.0 rely not merely on technological implementation but on the equilibrium between technology-induced job demands and the resources accessible to employees for managing those demands. This viewpoint is especially pertinent to emerging economies, as infrastructure, economic, organizational, and socio-cultural factors can determine if technological innovation serves primarily as a resource or a demand.

4.2. Theory of Cognitive Load

Cognitive Load Theory explains why the demands imposed by digital work may exceed employees' available working-memory resources^[19]. Intrinsic load arises from the complexity of the task itself. Extraneous load arises from avoidable burdens such as confusing interfaces, duplicated data entry, system delays, unclear procedures, and repeated interruptions. In HR 5.0 settings, unreliable connectivity and power interruptions can add extraneous effort because employees must repeat tasks, troubleshoot systems, or switch between digital and manual processes. Training, usable system design, staged implementation, and accessible technical support may reduce avoidable load. CLT is used here to explain a plausible cognitive mechanism; the review did not measure employees' cognitive load directly.

4.3. The Ubuntu Philosophy as a Cultural Intermediary

Ubuntu is an African philosophical orientation commonly associated with relational personhood, mutual care, reciprocity, solidarity, and shared responsibility^[20]. In workplace practice, these principles can inform participatory technology design, peer mentoring, intergenerational knowledge-sharing, collective problem-solving, and supportive responses to implementation difficulties. Ubuntu is not treated as a mediator in this framework because the review does not establish a tested intervening mechanism. Instead, it is conceptualized as a socio-cultural resource and contextual factor that may strengthen the availability and use of social resources within JD-R pathways. This framing also avoids equating Ubuntu with generic Western collectivism. Ubuntu foregrounds ethical relationality and the idea that individual flourishing is connected to the well-being of others and the community. The reviewed literature suggests its relevance, but direct empirical evidence on Ubuntu-based HR 5.0 practices remains limited and should be tested in future studies.

5. Literature Review

Industry 5.0 is a conceptual leap beyond Industry 4.0's technology-focused paradigm. Industry 4.0 emphasized automation, connectivity, AI, robotics, and data-centric production, while Industry 5.0 emphasizes human-centered, sustainable, and resilient work organization^[2]. Czvetkó et al.^[21] define Industry 5.0 as an approach where technology improves productivity, economic growth, employee benefit, empowerment, and sustainability. Humna resources management literature has increasingly incorporated this human-centric approach. Capolupo et al.^[22] define HRM 5.0 as human-centeredness, sustainability, human-machine integration, and personalized work. Digital proficiency, advanced

interpersonal skills, continuous education, and intercultural abilities are also key workforce traits in the changing technological landscape. Nahavandi^[23] believes Industry 5.0 should consider new technology as partners with humans rather than replacements. Technological advancements reshape not only organizational processes but also job roles, skillsets, decision-making responsibilities, and employee experiences, making this shift critical for HRM.

Veeramani and Arunkumar^[1] argue that HR 5.0 facilitates Industry 5.0 because businesses need organized methods for competency enhancement, reskilling, human-machine collaboration, data literacy, and critical thinking. This implies that HR 5.0 is more than just digitizing HR practices and processes. It represents an HR function progression to create work systems that combine technical and human skills for superior results. Baranyi^[9] avers that digitalization affects recruitment, learning, performance management, workforce skills, organizational strategy, and human-machine interaction. Therefore, is important for organizations to engage employees with competences to evaluate data, make informed decisions, and collaborate with intelligent technologies.

Technology has changed how organizations structure positions, design jobs, manage staff, and make strategic decisions. AI, machine learning, robotics, big data, cloud computing, and digital platforms can improve efficiency and decision-making, but their organizational value depends on human skills^[24]. As technology evolves, critical thinking, creativity, judgement, communication, and flexibility become more important.

HRM 4.0 perceives that technology changes employees' learning, communication, cooperation, and assessment processes as well as their tasks. Because of this, Baranyi^[9] argues that human resource professionals should gradually foster cooperation between people and intelligent technologies, while organizations restructure roles and develop skills for technologically advanced workplaces.

This assertion supports Industry 5.0's proposition that technology should improve human abilities rather than automate work. This further corroborates the European Commission^[15] assertion that innovation in technology should empower workers and strengthen organizations in the face of competition and globalization. Thus, the human factor becomes a strategic variable in technical growth rather than a barrier on implementation. However, the World Bank^[25] warns that technology adoption does not guarantee development but facilitates it when all the affordances are in place. Thus, organizations need more institutional frameworks and workforce competencies, especially those that enable workers to take advantage of digital technology.

5.1. Workforce Adaptability in Developing Economies

Technology constantly changes job skills and knowledge, making workforce adaptability increasingly important. Employees need to learn new technical skills and improve cognitive and social skills to remain relevant particularly in the HR 5.0 era, which is knowledge and technology driven. HR 5.0 requires businesses to switch from sporadic to continuous training, reskilling, and upskilling. The World Bank's^[25] study shows that developing economies benefit from digitalization only if workers have the skills to participate. Without parallel human-capital development, digital infrastructure may yield different results. Recent findings by Kaswan et al.^[26] support this fear. According to Malik et al.^[27] individuals, technology, organizational frameworks, cultural factors, tasks, and the environment all affect workforce preparedness. This is crucial for developing economies because workforce adaptation goes beyond digital literacy. It is dependent on organizational learning models, educational institutions, leadership, infrastructure, and institutional support.

HR should view flexibility as a fluid organizational competency. Employees should be given the opportunity to learn new skills, try new technology, and reframe their roles to remain competent and relevant in the pertaining environment. Organizations prefer HR systems that identify competency gaps and offer training before technology obsolesces skills. This resonates well with the principles of a learning organization which is always ready to adapt and try new things.

5.2. Human-Technology Collaboration, Autonomy, and Adoption

A significant divergence between Industry 4.0 and HR 5.0 pertains to the function allocated to employees in technology-driven environments. A technology-focused approach might regard employees as parts of an automated manufacturing system, while a human-focused approach aims to foster synergistic partnerships between individuals and intelligent technologies and is the way to go.

Escandon-Barbosa and Salas-Paramo^[28] assert that the effectiveness of digital transformation hinges on understanding the ways in which machines enhance human labor. The consequence for human resource management is that technological models must be supplemented with suitable job structuring, employee involvement, educational prospects, and independence. This issue gains significance as businesses utilize AI-powered surveillance, algorithmic oversight, and data-centric performance assessment. While these technologies might enhance organizational oversight of employee performance, an overabundance

of technology control may diminish perceived autonomy and elevate psychological stress. HR 5.0 necessitates a harmony between technological transparency and human autonomy.

Technology acceptance literature also indicates that adoption depends not only on the availability of a system but on users' expectations, social influence, and facilitating conditions^[29]. This complements the JD-R perspective by highlighting that access to training, support, and usable infrastructure can shape whether a digital tool is adopted and used effectively. The human-machine collaboration literature likewise argues for augmentation of human judgement and capability rather than assuming that automation should replace human contribution^[30]. African ICT scholarship further underscores the importance of affordability, access, and digital inequality when interpreting technology outcomes on the continent^[6].

The human-centered concepts of Industry 5.0 offer a valuable normative basis for establishing this equilibrium. Piccarozzi et al.^[31] notably prioritize employee welfare, competencies, and empowerment within the framework of Industry 5.0. Thus, the assessment of technological innovation should not be confined to efficiency improvements. Employee autonomy, learning, well-being, and job quality must also be taken into account.

5.3. Cognitive Demands and Technostress in Digital Work

The notion of cognitive balance brings a crucial human-centric aspect to HR 5.0. Technological improvements can boost employees' information accessibility, facilitate communication, and accelerate decision-making. Nevertheless, they may also lead to information saturation, continuous connection, multitasking demands, and the desire to respond fast^[32].

The literature on technostress gives a theoretical foundation for analysing these challenges. Zvavahera^[20] indicate that the features of information and communication technologies can create technostress and influence employee performance. Their perspective on person-environment fit is significant as stress emerges in part when technological expectations transcend employees' capabilities or accessible resources.

Research on technostress shows that technology-related demands such as overload, complexity, invasion of work into non-work time, uncertainty, and insecurity can contribute to strain when they exceed available resources^[7]. Recovery opportunities and manageable boundaries around digital availability are therefore relevant to sustainable HR 5.0.

Cognitive balance in HR 5.0 is the ability of employees to maintain cognitive function while navigating technology, information streams, connectivity, and job intensity. This concept ties HR 5.0 to job stress, psychological disengagement, employee welfare, and sustainable workplace design.

5.4. Job Resources, Well-Being, and Social Support

Job Demands-Resources (JD-R) provides a useful theoretical foundation for the paper. Demerouti et al.^[8] distinguish between workplace demands, which require ongoing physical or psychological effort, and job resources, which help employees achieve work goals, reduce demands, and boost motivation. High expectations cause tiredness, while resource shortages cause disconnection and burnout. Bakker and Demerouti^[11] demonstrate the JD-R framework's effectiveness in understanding employee well-being and organizational success. Employment services help people handle difficult job situations and this also aligned with Ubuntu tenets.

In HR 5.0, technology can be a resource and a requirement for work. Digital systems can speed up information access, automation, adaptability, and decision-making, reducing workload. Technology can cause information saturation, constant connectivity, monitoring, faster work speeds, and rapid responses. Instead of assuming technology advancement is good or bad, this duality provides a solid conceptual framework for cognitive balance analysis.

5.5. Human Resources Management 5.0 in Developing Economies

Developing economies' HR 5.0 transition is theoretically important since it differs from technical advances in the Global North. The World Bank (2016) shows that digital technology benefits are not evenly distributed and that infrastructure alone cannot promote inclusive digital advancement. Additional elements include employee competences, institutional integrity, legal frameworks, and technological accessibility. Thus, HR 5.0 in developing economies involve distinct conflicts. Organizations struggle to deploy cutting-edge technology while dealing with digital skills gaps, limited training resources, infrastructure constraints, and workforce inequalities. This makes HR departments crucial middlemen between technological innovation and staff proficiency.

5.6. The Zimbabwean Context

Zimbabwe's shift towards a digital and knowledge-based economy has established digitization, innovation, and human capital development as key national priorities. The National Development

Strategy 1 (NDS1) underscores the importance of human capital development, innovation, specialized workforce, and access to cutting-edge information and technologies as the cornerstones of a knowledge-driven economy^[33]. This strategic approach establishes a crucial foundation for understanding HR 5.0 as a human-centered evolution instead of only a technical shift, necessitating organizations to reframe recruitment, training, employee development, and workforce administration. Kunicova et al.^[4] revealed that despite the growth of digital connectivity, financial services, and digital platforms, Zimbabwe still faces challenges concerning infrastructure, affordability, rural accessibility, and digital skills. A mismatch between tertiary and higher education graduates and industry demands has further exacerbated skills shortages and the risk of present competences becoming obsolete as economic and technological needs progress. Therefore, technology advancement does not inherently offer organizational advantages. Employees must have ongoing opportunities to develop pertinent digital and non-digital skills, adjust to evolving work processes, and function synergistically with new technologies. The creation of the Ministry of Skills Audit and Development in 2023 illustrates the increasing acknowledgement in policy that labor capabilities must adapt to evolving economic and technological requirements. HR 5.0 necessitates a transition from perceiving human capital as a static repository of qualifications to recognizing it as a fluid capability defined by ongoing learning, reskilling, upskilling, and flexibility.

The technological evolution of employment underscores the necessity of workforce flexibility and intellectual skills. Digitalization transforms manufacturing methods, market models, and the skill demands of employers, heightening the significance of intricate problem-solving, teamwork, adaptability, learning agility, and resilience^[34]. For organizations in Zimbabwe, these skills are especially crucial due to the dual necessity of addressing skill deficits and engaging in a progressively innovation- and information-centric economy, aspiring to be a middle-income economy by 2030.

HR 5.0 should encompass not only the attainment of technical digital competencies but also the employees' ability to learn, adapt, and operate proficiently in technology-driven work settings. Zimbabwe's digital evolution is marked by significant disparities in internet connectivity, cost of data, infrastructure, and access to digital skills, resulting in employees facing technology advancements under unequal circumstances^[35]. Employees possessing dependable connectivity, suitable tools, relevant expertise, and institutional backing are more favorably situated to leverage technological advancements, rendering digital inclusion and organizational readiness critical contextual factors within an HR 5.0 paradigm.

The advent of AI introduces a new facet, as it is progressively utilized in recruitment, performance evaluation, training, and workforce analytics, which could enhance organizational efficiency while also provoking hesitations regarding autonomy, transparency, bias, privacy, and organizational preparedness^[36]. These advancements underscore the necessity for HR 5.0 to emphasize human oversight, workforce enhancement, ethical AI incorporation, and organizational readiness instead of mere technological implementation. Thus, the interplay between technology and human capital should be perceived as reciprocal. The knowledge, skills, and cognitive abilities of employees affect the adoption and implementation of technologies within organizational outcomes.

A notably significant, yet insufficiently researched of this relationship is cognitive balance, which pertains to employees' ability to sustain optimal cognitive performance and well-being in the face of evolving technology and occupational requirements. Digital technologies have the capacity to automate mundane tasks, enhance information accessibility, and promote adaptable work environments. They also tend to raise information saturation, connectedness, and demands for quick reactions^[37]. Technological advancement may thus yield a twofold impact, by augmenting employee competencies while simultaneously elevating cognitive requirements. Despite the substantial insights provided by Zimbabwean literature regarding human capital development, skills deficiencies, digitalization, and organizational transformation, there has been insufficient focus on how employees sustain cognitive balance in the face of ongoing technological advancements. The following section discusses the findings from this literature survey.

6. Findings and Discussion

The synthesis identifies five recurring themes: economic and institutional uncertainty can heighten the risks of unsupported technological change; inadequate infrastructure can transform technological assets into cognitive liabilities; Ubuntu-informed practices can strengthen social resources and support employees during technological transitions; workforce adaptability is central to the successful implementation of HR 5.0; and cognitive balance represents a promising conceptual construct that requires clearer operationalization and further empirical validation.

6.1. Economic and Institutional Uncertainty can Intensify the Risks of Unsupported Technological Change

The persistent socio-economic volatility in Zimbabwe frequently results in the development of high levels of adaptive capacity and crisis management skills among employees^[34]. Nevertheless, this psychological resilience is finite. Employees may perceive technology as an additional burden or a threat to job security when organizations introduce digital tools without structured reskilling or clear value propositions, rather than an enabler. This assertion is corroborated by Hanna Rahmi et al.^[10] who noted that in the absence of strategic support, employees employ adaptive capacity defensively, resulting in mental withdrawal, surface compliance, or passive resistance.

6.2. Limited Infrastructure Transform Technological Assets into Cognitive Liabilities

Automation tools simplify repetitive operations in stable digital environments, thereby reducing cognitive load. The converse is frequently the case in environments with limited infrastructure^[4]. The Zimbabwean environment alters the dynamics between technology and employee outcomes. Inadequate digital infrastructure, high data costs, inconsistent connectivity, power outages, skill deficiencies, and overarching economic challenges can convert technologies that often enhance productivity into sources of technological friction and mental strain. According to the synthesis, technology is not the only source of stress for workers. Instead, new cognitive demands are created by technology in conjunction with poor infrastructure, inadequate skills, and frequent system disruptions^[37]. These pressures may result in burnout, mental exhaustion, and technostress, which could lower employee morale and productivity.

6.3. Ubuntu-informed Practices may Strengthen Social Resources During Technological Change

Global North HRM models often focus on individualistic coping mechanisms for example personal mindfulness applications, individual boundary setting to manage digital burnout. However, Ubuntu provides a collective alternative in the African context^[20]. When Ubuntu values are incorporated into HR 5.0 strategies, digital transitions are designed collaboratively for instance, tech-savvy young employees partnering with experienced senior staff. Failures during digital transitions are treated as collective learning opportunities, and human interaction remains central to organizational life. This paper proposes that Ubuntu-based practices, collective responsibility, peer support, mentoring, cooperation

and relational solidarity can complement conventional HR 5.0 interventions. This is particularly relevant because most existing approaches to technological stress rely heavily on individualistic coping mechanisms.

6.4. Workforce Adaptability is Central to Successful HR 5.0 Implementation

The literature suggests that qualifications or prior work experience are insufficient in technological environments that are swiftly evolving^{[26][25]}. Continuous learning, cognitive flexibility, problem-solving capabilities, collaboration, and learning agility are essential for employees. As a result, the study views human capital as a dynamic capacity for continuous adaptation, rather than an inert stock of qualifications.

Strategic reskilling and upskilling can assist employees in adapting to technological demands and enhancing their adaptability. Consequently, the synthesis identifies continuous learning, digital training, and competency development as resources that can enhance resilience and mitigate the adverse consequences of technological change^[33]. Upskilling and reskilling are indispensable job resources.

6.5. Cognitive Balance is a Proposed Construct that Merits Clearer Operationalization

Across the reviewed literature, attention to digital skills, human-machine collaboration, and productivity appears more developed than explicit conceptualization and measurement of employees' ability to manage cognitive demands during technological change. In this paper, cognitive balance is defined as the provisional capacity to maintain workable attention, comprehension, and mental functioning when technological demands are matched by adequate individual, social, and organizational resources. It differs from cognitive load, which refers to the demands placed on working memory; from technostress, which refers to strain associated with technology use; from psychological well-being, a broader state of functioning; and from resilience, the capacity to adapt or recover under adversity. Cognitive balance is proposed by this paper as a sensitizing construct, not an established validated scale. Its dimensions and measurement require empirical development.

7. Contribution to Practice

For HR practitioners, the synthesis supports a precautionary, human-centered approach to technology implementation. Before deployment, organizations should assess task and skill requirements, employee readiness, accessibility, connectivity, power continuity, data costs, privacy, and workload implications.

Implementation should include employee participation, staged training, accessible technical support, reskilling pathways, clear rules for monitoring and after-hours availability, and routine checks for overload or workarounds. These recommendations follow from the patterns in the reviewed literature. Their effectiveness in particular Zimbabwean organizations has not been tested by this study.

8. Contribution to Policy

For policymakers, the synthesis indicates that digital transformation and human-capital development should be treated as interdependent policy priorities. Potential priorities include reliable electricity, affordable connectivity, inclusive digital-skills development, worker protections in algorithmically managed settings, and support for organizations implementing human-centred technology. These are implications derived from the literature, not evaluated policy effects. Policy design should account for differences in sector, geography, organization size, and employee access to digital resources.

9. Proposed Areas for Future Studies

Future studies could focus on:

- measuring how varying levels of infrastructure disruption impact intrinsic, extrinsic, and germane cognitive loads among employees in developing economies;
- investigating how HR 5.0 adoption varies across key sectors in Zimbabwe and similar contexts, such as financial services, telecommunications, agriculture, and mining; and
- examining the long-term impact of Ubuntu-mediated peer mentoring programs on technostress mitigation and talent retention in volatile economies.

10. Conclusions

This literature-based paper suggests that the human consequences of HR 5.0 depend on more than technology adoption. The reviewed literature describes potential gains in information access, automation, decision-making, and learning, alongside risks associated with overload, continuous connectivity, surveillance, and poorly supported implementation. The JD-R model helps explain why the balance between demands and resources matters, while CLT highlights the potential contribution of task complexity and avoidable system burdens. These are literature-derived interpretations rather than causal findings generated by primary data.

Zimbabwe provides a focal case because the reviewed sources identify infrastructure, affordability, economic, and digital-skills constraints that may intensify the effort required to use workplace technologies. These conditions are not uniform across all organizations or employees, and the framework should not be read as a claim that every Zimbabwean workplace experiences the same barriers.

The review also establishes that workforce adaptability is a critical mechanism for organizations to transform technological transformation into sustainable organizational value. Employees' ability to adjust to technological advancements can be enhanced through continuous upskilling, reskilling, digital learning, and supportive job design. Nevertheless, adaptability should not be interpreted as a solely individual responsibility. Organizations are obligated to provide the infrastructure, training, autonomy, social support, and psychological resources that are essential for successful adaptation.

Cognitive balance is advanced as a potentially useful construct for directing attention to whether employees can manage technological demands with the cognitive, social, and organizational resources available to them. It should not be confused with cognitive load, technostress, well-being, or resilience, and it has not been operationalized or validated in this paper. Future empirical work should define its dimensions, develop suitable measures, and test whether it explains outcomes beyond established constructs.

Ubuntu is framed as a socio-cultural resource that may support human-centered technological change through mutual support, peer mentoring, shared responsibility, and collective learning. The proposed framework does not establish Ubuntu as a mediator or demonstrate that Ubuntu-based practices reduce technostress, rather, it identifies a culturally grounded pathway for future empirical investigation.

The paper's conceptual contribution is to connect HR 5.0 practices, workforce adaptability, and the proposed construct of cognitive balance while specifying infrastructure and Ubuntu-informed social resources as contextual conditions. Its principal limitation is that it relies on a heterogeneous body of literature and an incomplete original search audit trail. The available records do not preserve database-specific search dates, complete original search strings, separate duplicate counts, reason-specific full-text exclusion counts, or a formal critical-appraisal record. This limits reproducibility and means the framework should be treated as provisional. Future research should rerun and document the searches, use a recorded quality-appraisal process, conduct interviews or surveys in Zimbabwean workplaces, validate a cognitive-balance measure, and test the proposed relationships across sectors and comparable developing economies.

Statements and Declarations

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Data Availability

The dataset is available from the corresponding author upon reasonable request.

Use of Generative of AI

Quillbot was used for language refinement, editing, formatting, and improving clarity of expression. All substantive intellectual contributions including the development of ideas, arguments, theoretical frameworks, are entirely the original work of the author.

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