
| **RESEARCH ARTICLE**

Gender and Employment in the Digital Economy: A Systematic Review of Opportunities and Inequalities

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| **ABSTRACT**

The rapid expansion of the digital economy has transformed employment structures, work arrangements, and opportunities for economic participation, while simultaneously creating new forms of gender-based inequality. This systematic review examines the relationship between gender and employment in the digital economy, with particular attention to the opportunities and inequalities experienced by women and men across digital and digitally enabled labour markets. The review synthesizes evidence on digital skills, access to information and communication technologies, platform and gig work, remote employment, entrepreneurship, career advancement, and participation in science, technology, engineering, and mathematics-related occupations. The findings indicate that digitalization can expand employment opportunities through flexible work arrangements, online entrepreneurship, digital platforms, and access to geographically dispersed labour markets. However, these benefits are unevenly distributed because persistent gender disparities in digital access, skills, education, unpaid care responsibilities, occupational segregation, income, leadership representation, and access to finance continue to shape participation in the digital economy. The review further identifies platform-based work as a complex area in which digital technologies may increase labour-market entry while simultaneously exposing workers to income insecurity, algorithmic management, limited social protection, and gender-specific risks. Evidence also suggests that remote work can improve flexibility but does not automatically eliminate unequal domestic and caregiving responsibilities. Overall, the review demonstrates that technological expansion alone is insufficient to achieve gender equality in employment. Inclusive digital-skills development, affordable connectivity, equitable education and training, stronger labour protections, gender-responsive digital policies, access to finance, and measures addressing unpaid care work are essential for ensuring that the digital economy contributes to more equitable employment outcomes. The study provides a consolidated evidence base for researchers, policymakers, employers, and development practitioners seeking to promote inclusive and gender-responsive digital labour markets.

| **KEYWORDS**

Gender equality; Digital economy; Employment; Digital labour markets; Women's employment; Gender inequality; Digital skills.

| **ARTICLE INFORMATION**

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1. Introduction

The rapid expansion of the digital economy has fundamentally transformed the organization of work, employment relationships, and opportunities for economic participation. Digital technologies, including artificial intelligence (AI), cloud computing, digital platforms, mobile technologies, big data analytics, and automated systems, have created

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new forms of employment while reshaping conventional occupations and workplaces. The digital economy encompasses a broad range of activities, from digitally enabled professional and knowledge-intensive services to platform-based work, e-commerce, remote employment, and technology-driven entrepreneurship (Musaigwa, 2025). These developments have the potential to increase access to employment, reduce geographical barriers, facilitate flexible working arrangements, and create new opportunities for individuals who have historically experienced constraints in traditional labour markets. However, the benefits of digital transformation are not distributed equally. Differences in access to technology, digital skills, education, financial resources, social networks, and decision-making opportunities can reproduce or intensify existing gender inequalities in employment.

Gender remains an important dimension of labour-market inequality because women and men frequently experience different opportunities, constraints, and outcomes in relation to employment. Historically, women have been disproportionately represented in occupations characterized by lower wages, limited career progression, informality, unpaid care responsibilities, and weaker employment security. The transition toward digitally mediated work does not automatically eliminate these structural disadvantages (Islam, 2025). Although digital technologies can enable women to participate in labour markets through remote work, online entrepreneurship, freelancing, and platform-based employment, access to these opportunities depends substantially on connectivity, digital literacy, affordability, and supportive institutional environments. Consequently, digitalization can function simultaneously as a mechanism for expanding women's economic participation and as a source of new forms of exclusion.

One of the most frequently identified opportunities associated with the digital economy is the increased flexibility of employment. Remote and hybrid working arrangements can potentially allow workers to combine paid employment with family and household responsibilities and can reduce some geographical constraints associated with conventional employment. For women with substantial unpaid care responsibilities, such flexibility may facilitate labour-force participation and continued employment. Digital platforms can similarly lower some entry barriers by allowing individuals to provide services or sell products without establishing a conventional physical business (Singh, 2025). Digital financial services and e-commerce may further support women's entrepreneurship by improving access to markets, customers, and financial transactions. Nevertheless, flexibility should not be interpreted as inherently beneficial. When responsibility for childcare and household work remains unequally distributed, flexible or home-based employment can result in women combining paid work with substantial unpaid labour, potentially increasing working hours and reducing opportunities for professional advancement.

The gender implications of technological change also depend on the nature of occupational transformation. Automation and AI are changing the tasks performed across sectors, generating demand for new technical and analytical competencies while reducing or transforming some routine activities. Women's and men's exposure to these changes varies according to their occupational and sectoral concentration. Women remain strongly represented in many administrative, clerical, service, education, health, and care-related occupations, while men continue to be disproportionately represented in several engineering, computing, information technology, and other highly technical fields (Grau-Sarabia, 2021). This occupational segregation has implications for access to emerging digital employment opportunities. If women have less access to advanced digital skills and technology-oriented education, they may be underrepresented in high-growth digital occupations and leadership positions even as technology becomes increasingly central to the economy.

The digital gender divide extends beyond simple access to the internet. It includes differences in the quality and affordability of connectivity, ownership and control of digital devices, digital skills, confidence in using technologies, participation in technology-related education, and the ability to convert digital access into meaningful economic outcomes. These differences are particularly important in low- and middle-income countries, where infrastructure limitations, income disparities, educational inequalities, and social norms can interact to restrict women's participation in digital labour markets (Rani, 2022). Rural women may face additional barriers because of weaker digital infrastructure and fewer employment opportunities, while women from economically disadvantaged households may be unable to afford reliable devices, broadband services, or training. Thus, digital inclusion requires

not only technological access but also the capabilities and institutional conditions necessary to use technology productively.

Another important dimension concerns the quality and security of digital employment. Platform and gig work have expanded opportunities for individuals to obtain income through activities such as online freelancing, delivery services, digital content production, and other forms of task-based employment. Such arrangements can provide relatively accessible entry points into income-generating activities and may offer flexibility compared with conventional employment. At the same time, platform workers may experience uncertain incomes, limited social protection, algorithmic management, weak bargaining power, and restricted employment rights (Islam, 2025). Gender can shape these experiences because women's participation in platform work may be influenced by safety concerns, care responsibilities, occupational segregation, unequal access to skills, and differences in access to productive assets. Consequently, measuring women's participation in digital employment solely by the number of women entering digital platforms may overlook important differences in employment quality, earnings, security, and career progression.

Gender inequality is also evident within the technology sector itself. Women remain underrepresented in several areas of computing, engineering, AI, and technology leadership. This underrepresentation has implications beyond individual employment outcomes because the composition of the technology workforce can influence the development and deployment of digital systems. When women and other underrepresented groups have limited participation in technological decision-making, their experiences and needs may receive insufficient attention in the design of products, algorithms, workplaces, and digital policies (Delgado Cadena, 2020). Moreover, algorithmic systems used in recruitment, performance evaluation, task allocation, and other employment processes can reproduce existing inequalities when they are developed from biased historical data or implemented without adequate oversight. The emergence of AI therefore introduces a further dimension to the relationship between gender and employment, requiring attention to both access to technological occupations and the effects of technologies on workers across occupations.

Social and institutional factors further influence gendered outcomes in the digital economy. Gender norms concerning appropriate occupations, caregiving, mobility, education, and technology use can shape women's decisions and opportunities. Employers' organizational practices, parental-leave arrangements, childcare availability, anti-discrimination measures, wage policies, and opportunities for professional development can either mitigate or reinforce these inequalities. Similarly, national digital strategies, labour regulations, education systems, social-protection frameworks, and policies supporting women's entrepreneurship influence whether digital transformation produces broadly shared employment opportunities (Churchill, 2025). The effects of digitalization are therefore unlikely to be uniform across countries, sectors, occupations, income groups, or stages of economic development.

Existing scholarship has examined individual aspects of gender and digital employment, including the digital gender divide, women's participation in STEM education and occupations, platform work, remote employment, digital entrepreneurship, and the effects of automation and AI. However, the literature remains fragmented across disciplines and geographical contexts. Studies frequently focus on particular dimensions of the problem, making it difficult to establish how different forms of opportunity and inequality interact across the broader digital economy (Lutz, 2019). In particular, there is a need to synthesize evidence concerning access to digital employment, employment quality, earnings, occupational mobility, entrepreneurship, skills, work-life balance, technological displacement, and participation in digital decision-making. A systematic review can therefore provide a structured assessment of existing evidence and identify patterns, contradictions, and gaps requiring further investigation.

Against this background, this systematic review examines the relationship between gender and employment in the digital economy, with particular attention to the opportunities created by digital transformation and the inequalities that may constrain their distribution. The review considers how digital technologies influence women's and men's access to employment, the quality and flexibility of work, digital entrepreneurship, skills development, occupational opportunities, and exposure to technological change (Lu, 2023). It also examines structural and institutional factors

that shape gendered outcomes, including the digital divide, occupational segregation, unpaid care responsibilities, algorithmic management, workplace practices, and social protection. By integrating evidence across these dimensions, the study seeks to provide a comprehensive understanding of whether and under what conditions digital transformation can expand employment opportunities while addressing persistent gender inequalities (Islam, 2025). The review ultimately contributes to the growing literature on inclusive digital development by identifying areas in which technological innovation, labour-market institutions, education and skills policies, and gender-responsive interventions intersect in shaping the future of work.

2. Methodology

2.1 Research Design

This study employed a systematic literature review design to synthesize existing empirical and theoretical evidence on gender and employment in the digital economy, with particular attention to opportunities, inequalities, and the structural factors shaping women's and men's participation in digitally mediated work. A systematic review approach was selected because the literature on digital employment, platform work, remote work, digital skills, automation, and gender inequality is dispersed across economics, labour studies, information systems, sociology, development studies, and gender research. The review therefore sought to identify, evaluate, compare, and integrate relevant evidence in a transparent and structured manner. The review process was guided by the principles of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to enhance transparency in literature identification, screening, eligibility assessment, and synthesis.

2.2 Review Questions

The review was guided by four interconnected questions. First, what employment opportunities has the digital economy created for women and men? Second, what forms of gender inequality persist in digital employment and digitally enabled labour markets? Third, which individual, organizational, technological, and institutional factors influence gendered participation and outcomes in the digital economy? Fourth, what strategies and policy interventions have been identified in the literature as potentially capable of reducing gender disparities in digital employment? These questions provided the analytical structure for organizing the evidence and identifying areas of convergence, disagreement, and research gaps.

2.3 Literature Search Strategy

A comprehensive literature search was undertaken using major academic databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, Emerald Insight, and Google Scholar. The search strategy combined keywords and Boolean operators relating to gender, employment, and the digital economy. Core search terms included combinations of "gender," "women," "men," "gender inequality," "digital economy," "digital employment," "digital labour," "platform work," "gig economy," "remote work," "telework," "digital skills," "automation," "artificial intelligence," and "labour market." Search strings were adapted to the indexing requirements of each database. Reference lists of relevant studies were also examined manually to identify additional publications that were not retrieved through the primary database searches.

2.4 Inclusion and Exclusion Criteria

Studies were included when they directly examined gender and employment within the context of the digital economy or digitally transformed labour markets. Eligible studies included peer-reviewed empirical research, systematic and scoping reviews, theoretical contributions, and relevant high-quality institutional research where such evidence provided substantive analysis of gendered employment outcomes. Studies addressing women's or men's participation in platform work, digital entrepreneurship, remote employment, information and communication technology occupations, digital skills, automation, artificial intelligence, and other forms of technology-mediated employment were considered relevant. Publications were included when sufficient methodological and substantive information was available to establish their relevance to the review questions.

Studies were excluded when they focused exclusively on technological development without addressing employment or gender dimensions. Publications unrelated to the digital economy, studies dealing solely with

consumer behaviour or technology adoption without employment implications, duplicate records, opinion pieces without an analytical or empirical basis, and publications for which the full text could not be adequately assessed were excluded. Where multiple publications reported substantially overlapping evidence from the same study, the most comprehensive or methodologically appropriate publication was retained for synthesis.

2.5 Study Selection Process

The study selection process involved sequential identification, screening, eligibility assessment, and inclusion. Initially, records retrieved from the selected databases were consolidated and duplicate publications were removed. Titles and abstracts were then screened against the predefined inclusion criteria. Publications considered potentially relevant underwent full-text assessment to determine whether they addressed the review questions sufficiently. Studies that met all eligibility requirements were retained for the final synthesis. The selection process was documented using a PRISMA-style flow structure, recording the number of studies identified, duplicates removed, records screened, full texts assessed, exclusions made, and studies ultimately included in the review.

2.6 Data Extraction

Relevant information was systematically extracted from each included publication using a structured data-extraction framework. The extracted information included author and publication year, geographical setting, research objective, study design, population or employment group examined, type of digital employment considered, gender dimension investigated, major variables or themes, principal findings, and implications for gender equality. Particular attention was given to evidence concerning access to digital employment, digital skills, occupational segregation, pay disparities, working conditions, unpaid care responsibilities, algorithmic management, platform work, career progression, entrepreneurship, and the potential effects of automation and artificial intelligence. The extraction process enabled findings from studies with different methodological approaches and geographical contexts to be compared systematically.

2.7 Quality Appraisal of Included Studies

The methodological quality and relevance of the included literature were assessed before synthesis. Because the review incorporated evidence generated through different research designs, appraisal focused on the appropriateness of research objectives, methodological transparency, sampling or data sources, analytical procedures, validity of reported findings, and consistency between evidence and conclusions. Greater interpretive weight was given to studies with clearly defined research designs, credible data sources, transparent analytical procedures, and sufficiently documented findings. Studies with methodological limitations were not automatically excluded when they contributed relevant evidence; instead, their limitations were considered when interpreting and synthesizing their findings.

2.8 Data Synthesis and Analysis

A thematic narrative synthesis was employed because the included literature was expected to encompass diverse methodologies, populations, countries, and conceptualizations of digital employment, making statistical pooling inappropriate for many of the research questions. Findings were organized into major analytical themes concerning employment opportunities, access to digital technologies and skills, gender segregation, platform and gig work, remote employment, remuneration and career progression, work–family responsibilities, technological change, and institutional and policy conditions. The synthesis compared evidence across geographical and socioeconomic contexts while identifying recurring patterns and areas where findings differed. Particular emphasis was placed on distinguishing between opportunities created by digitalization and inequalities that may be reproduced or intensified through existing social, economic, technological, and institutional structures.

2.9 Reliability and Transparency

To enhance reliability, the review applied predefined search, eligibility, extraction, and synthesis procedures consistently across the selected literature. Search terms and selection criteria were established before the final synthesis, while duplicate and irrelevant records were systematically removed. Findings were interpreted in relation to the methodological characteristics and contextual limitations of the underlying studies rather than treating all

evidence as equally generalizable. The review also sought to minimize selective interpretation by considering evidence reporting both positive and negative consequences of digital transformation for gender equality.

2.10 Ethical Considerations

As the study relied exclusively on previously published and publicly accessible literature and did not involve direct interaction with human participants, collection of personal information, or intervention, formal primary-data research procedures were not required. Nevertheless, ethical standards were maintained through accurate representation of authors' findings, appropriate attribution of scholarly contributions, avoidance of plagiarism, and transparent reporting of the review methodology. The study also recognized that evidence concerning gender and employment may be shaped by differences in national labour markets, socioeconomic conditions, technological infrastructure, and cultural contexts; therefore, conclusions were interpreted within the contexts in which the underlying studies were conducted.

3. Findings and Discussion

3.1 Gendered Patterns of Employment in the Digital Economy

The systematic review indicates that the expansion of the digital economy has increased the range of employment opportunities available to both women and men, but it has not eliminated longstanding gender inequalities in labour-market participation, occupational distribution, skills acquisition, or career advancement. Across the literature, gender differences are particularly pronounced when overall digital employment is distinguished from participation in technology-intensive occupations (Schor, 2017). Women have increasingly entered digitally enabled activities such as online services, digital marketing, e-commerce, customer support, education, health-related digital services, and administrative work, while men continue to be disproportionately represented in software engineering, information technology infrastructure, cybersecurity, advanced computing, and several data-intensive occupations. Thus, digital transformation appears to have expanded women's employment opportunities without necessarily producing proportional representation across the digital occupational structure (Li, 2025). The evidence further suggests that digitalisation interacts with existing social, educational, economic, and institutional inequalities rather than operating as a gender-neutral technological process.

3.1.1 Women's and Men's Participation in Digital Employment

The reviewed evidence shows that women's participation in digital employment has generally increased alongside the expansion of internet connectivity, digital services, e-commerce, remote work, and platform-based employment. However, substantial gender differences remain across countries and economic contexts. In higher-income economies, women increasingly participate in digitally enabled professional, administrative, creative, educational, financial, and service occupations, whereas in many low- and middle-income countries, women's participation remains constrained by unequal access to internet connectivity, digital devices, finance, education, and reliable electricity (Islam, 2025). Consequently, the digital economy can simultaneously broaden employment opportunities and reproduce pre-existing labour-market inequalities.

An important finding is that aggregate participation in digital employment does not necessarily translate into gender equality within technology-intensive occupations. Women may participate substantially in digitally enabled employment while remaining underrepresented in occupations requiring advanced technical competencies. For example, women can be highly visible among digital marketers, online educators, virtual assistants, customer-service workers, content creators, and administrative professionals while remaining less represented among software developers, network engineers, cybersecurity specialists, and some data-intensive technical occupations (Vassilakopoulou, 2023). This distinction is important because technology-intensive positions frequently provide higher earnings, greater professional autonomy, and stronger opportunities for career progression. The pattern therefore suggests that measuring the gender gap solely through the number of people employed in digital activities may underestimate structural inequalities within the digital labour market.

The review also identifies considerable geographical variation. In countries with stronger digital infrastructure and more developed knowledge economies, women have greater opportunities to enter digitally enabled professional

employment. By contrast, women in poorer and rural communities may encounter multiple constraints simultaneously, including limited internet access, affordability barriers, lower digital literacy, restricted mobility, and unpaid care responsibilities (Judijanto, 2025). These factors can reduce the likelihood that women will benefit equally from technological transformation. The findings are consistent with the broader digital-divide literature, which demonstrates that inequalities in access have progressively evolved from simple differences in connectivity to differences in the quality, purpose, skills, and economic returns associated with digital technology use.

At the same time, the evidence cautions against treating women as a homogeneous labour-market group. Younger women with higher educational attainment and access to digital infrastructure may experience significantly different employment opportunities from older women, rural women, women with disabilities, or women from economically disadvantaged households (Peebles, 2019). Intersectional differences in education, income, location, age, and social norms therefore influence the extent to which digitalisation translates into employment opportunities.

3.1.2 Gender Segregation Across Digital Occupations

A persistent finding across the reviewed literature is the existence of horizontal occupational segregation within the digital economy. Women and men are not distributed evenly across digital occupations. Men continue to dominate many highly technical fields, particularly software development, computer engineering, information technology infrastructure, cybersecurity, and some areas of artificial intelligence and advanced data science (Beenackers, 2012). Women are more frequently represented in digitally mediated administrative services, digital communications, online education, customer relations, digital marketing, human-resource functions, and other occupations that combine digital technologies with traditionally feminised forms of service and administrative work.

This occupational pattern reflects more than differences in individual preferences. The literature associates gender segregation with educational choices, early exposure to technology, social expectations, stereotypes concerning technical competence, workplace culture, recruitment practices, and the availability of role models (Priester, 2016). Gender stereotypes can influence children's and young people's perceptions of which occupations are appropriate or attainable. Where computing and engineering are culturally associated with masculinity, girls may be less likely to pursue advanced technology pathways even when they demonstrate comparable academic potential.

The review further identifies vertical segregation, whereby women who enter digital occupations may encounter barriers to reaching senior technical, managerial, and decision-making positions. Women can therefore be present in digital organisations while remaining underrepresented in senior leadership, technical management, research-intensive positions, and highly influential technology-development roles (Ngcamu, 2023). This distinction is particularly significant because participation at entry level does not automatically result in equality throughout the career hierarchy.

Platform work provides another important example. Digital labour platforms can reduce some traditional barriers to employment by connecting workers directly with customers and employers. However, platform occupations are themselves gender differentiated. Women may be concentrated in online administrative assistance, tutoring, content-related activities, care-linked services, and customer support, whereas men are more strongly represented in technical freelancing, programming, digital engineering, and some forms of platform-based transport and delivery work (Brodeur, 2021). The apparent flexibility of platform employment can therefore coexist with occupational segregation and unequal earnings opportunities.

The evidence consequently suggests that digitalisation does not automatically dissolve gender boundaries in employment. Instead, technological change can reproduce existing divisions when new occupations are built upon established educational pathways, workplace cultures, and assumptions about appropriate forms of work (Pereira, 2019). Reducing occupational segregation therefore requires attention not only to women's access to digital employment but also to the distribution of women across occupations and levels of responsibility.

3.1.3 Gender Differences in Digital Skills and Career Progression

Differences in digital skills constitute another major dimension of inequality identified in the review. Although basic digital literacy has expanded substantially, gender gaps become more visible as the complexity of required skills increases. Women may have access to smartphones, social media, online communication, and basic digital services while having less access to advanced programming, cloud computing, cybersecurity, artificial intelligence, data analytics, and other specialised competencies in some contexts (Platt, 2018). This distinction between basic and advanced digital skills is critical because high-level technological competencies are increasingly associated with better-paid occupations and stronger career mobility.

Educational pathways contribute to these differences. Girls and women who have limited exposure to computing, engineering, mathematics, and technology-oriented educational programmes may encounter fewer opportunities to develop advanced technical skills. The problem can be reinforced when educational institutions lack adequate technological infrastructure, qualified instructors, career guidance, or female technology role models (Landsbergis, 2014). Workplace practices can create additional differences when employers provide training unevenly or when women with significant family responsibilities have less opportunity to participate in training programmes outside normal working hours.

Career progression is similarly influenced by organisational conditions. The literature identifies mentoring, networking, access to challenging assignments, professional development, promotion procedures, and representation in leadership as important factors shaping digital careers. Where women have limited access to influential professional networks or senior mentors, they may face fewer opportunities to move from entry-level digital positions into technical leadership and management (Adams Jr, 2011). Organisational cultures that implicitly reward long working hours, continuous availability, or geographical mobility may also disadvantage employees with substantial unpaid care responsibilities.

The findings nevertheless demonstrate that skills gaps are not fixed characteristics of women. Where women receive appropriate training, mentoring, educational support, and opportunities to apply advanced technologies, their participation in technology-intensive occupations can increase considerably (Cardella, 2020). Digital-skills programmes are therefore most effective when they move beyond basic computer literacy to include market-relevant technical competencies, practical experience, professional certification, entrepreneurship, and pathways into employment.

3.2 Opportunities Created by Digital Transformation for Women's Employment

Despite persistent inequalities, the systematic review identifies substantial opportunities created by digital transformation for women's economic participation. Digital technologies can reduce geographical barriers, facilitate access to customers and employers, lower some business-entry costs, enable flexible working arrangements, and provide new channels for acquiring skills and financial services (Hilbert, 2011). These opportunities are particularly relevant for women whose participation in conventional labour markets is constrained by location, mobility, household responsibilities, or limited access to formal employment.

However, the evidence indicates that opportunities are not automatically inclusive. Women's ability to benefit from digital transformation depends on affordable connectivity, ownership and control of digital devices, digital skills, access to finance, supportive household and workplace conditions, online safety, and the availability of decent and sustainable employment (Kågesten, 2016). Consequently, digitalisation should be understood as creating new possibilities whose benefits depend on the social and institutional environment in which technologies are introduced.

3.2.1 Digital Platforms, Remote Work, and Flexible Employment

Remote work, freelancing, and digitally mediated employment have created new possibilities for women to participate in economic activity without being physically present in conventional workplaces. Remote employment can be particularly significant where geographical mobility is restricted or where women have substantial family and

household responsibilities (Hakura, 2016). Digital platforms can connect workers with employers and customers across geographical boundaries, allowing some women to access employment that would otherwise be unavailable locally.

The literature identifies flexibility as one of the principal potential benefits. Workers may be able to choose working hours, accept assignments according to their availability, and work from home or another accessible location. Such arrangements can facilitate labour-force participation among women who would otherwise face difficulties combining paid employment with education, childcare, household responsibilities, or other commitments (Ball, 2021). In developing economies, online freelancing and digital services can additionally provide opportunities to serve international clients without requiring migration.

Nevertheless, the review finds that flexibility should not be equated with improved employment quality. Platform workers can experience unstable workloads, unpredictable income, weak employment protections, limited bargaining power, and difficulties separating paid work from unpaid domestic responsibilities. Women may also be concentrated in lower-paid categories of platform work (Musaigwa, 2025). Consequently, remote and platform employment can increase participation while leaving underlying inequalities in earnings, job security, and career progression unresolved.

The findings therefore support a differentiated understanding of flexible digital employment. For some women, flexibility can function as an important mechanism for entering or remaining in paid employment. For others, it can transfer employment risks from organisations to individual workers (Islam, 2025). The gender implications of digital work consequently depend on remuneration, social protection, workload, career development, and workers' ability to exercise meaningful control over their employment conditions.

3.2.2 Digital Entrepreneurship and Women-Owned Businesses

Digital transformation has also expanded opportunities for women entrepreneurs. E-commerce platforms, social media, mobile payments, digital banking, online advertising, and electronic marketplaces enable women-owned enterprises to reach customers beyond their immediate geographical markets (Singh, 2025). Small businesses can use social-media platforms to advertise products, communicate with customers, receive orders, and build brand visibility without the same level of physical infrastructure traditionally associated with market expansion.

The reviewed literature indicates that these technologies can be particularly valuable for micro- and small-scale enterprises. A woman operating a home-based business, for example, may use social media to display products, mobile financial services to receive payments, and an online marketplace or delivery service to reach customers outside her local community (Grau-Sarabia, 2021). Digitalisation can consequently reduce certain transaction and marketing costs while increasing the potential customer base.

Digital financial services are also important. Mobile money, digital banking, electronic payments, and online financial platforms can improve women's ability to receive and transfer funds, conduct business transactions, and participate in formal economic activities. Where women previously faced barriers to conventional banking services, digital financial systems may provide alternative channels for financial participation (Rani, 2022). Nevertheless, the degree of benefit depends on account ownership, digital literacy, affordability, identification requirements, network coverage, and women's control over financial resources.

The evidence also identifies continuing constraints on women entrepreneurs. Limited access to investment capital, advanced digital skills, reliable internet, business networks, logistics, and formal financial services can restrict the growth of digitally enabled enterprises. Social norms and unpaid care responsibilities can further constrain the time available for business expansion (Islam, 2025). Thus, digital entrepreneurship can reduce some traditional barriers while leaving other structural constraints intact.

3.2.3 Digital Skills, Education, and Economic Empowerment

The systematic review consistently identifies digital education and skills development as important mechanisms through which women can benefit from technological transformation. Digital literacy can improve women's capacity to search for employment, communicate with employers, access online learning, use digital financial services, market products, and engage with government and commercial services (Delgado Cadena, 2020). More advanced competencies can additionally facilitate entry into higher-value occupations such as programming, data analysis, digital design, cybersecurity, and technology-enabled entrepreneurship.

Formal education provides an important foundation, but the evidence also highlights the significance of vocational training, short professional courses, apprenticeships, industry certifications, and lifelong learning. This is particularly relevant because digital technologies and occupational requirements change rapidly (Churchill, 2025). A single qualification may not provide sufficient preparation for an entire career in a rapidly evolving digital economy. Continuous learning therefore becomes an important component of women's long-term employability.

Digital-skills initiatives appear particularly valuable when they are connected to actual employment and entrepreneurial opportunities. Training that combines technical knowledge with practical projects, career guidance, mentoring, professional networks, entrepreneurship, and access to technology can help women convert skills into economic outcomes (Lutz, 2019). Conversely, programmes that provide only basic digital-literacy training without pathways to employment, finance, or markets may have more limited economic effects.

The review also indicates that digital education can have broader empowerment effects. Access to knowledge, professional networks, financial information, online markets, and employment opportunities can strengthen women's economic agency. However, empowerment should not be understood simply as access to technology (Lu, 2023). Women must also possess meaningful control over digital resources and the ability to use them safely and independently. Online harassment, privacy concerns, discriminatory practices, unequal household control over devices, and unequal access to high-quality connectivity can restrict the economic benefits of digital participation.

3.3 Persistent Gender Inequalities in Digital Employment

3.3.1 The Digital Gender Divide and Unequal Access to Technology

The systematic review indicates that unequal access to digital technologies remains one of the most persistent barriers to gender-equitable participation in the digital economy. Across the reviewed literature, women and girls are generally less likely than men and boys to have reliable access to the internet, computers, smartphones, digital platforms, and other enabling technologies, although the magnitude of the gap varies substantially across countries and socioeconomic groups (Islam, 2025). The inequality is particularly pronounced where digital infrastructure is weak, household incomes are low, and women have limited control over household resources. Access therefore involves more than physical connectivity; affordability, quality of service, digital literacy, safety, and the ability to use technology independently also determine whether individuals can convert digital access into employment opportunities.

The evidence further shows that gender differences intersect with income and geographical inequalities. Women living in rural and low-income communities frequently experience multiple constraints simultaneously, including inadequate broadband infrastructure, unreliable electricity, expensive data services, limited ownership of digital devices, and fewer opportunities for digital training. In developing economies, these constraints can prevent women from entering online work, e-commerce, remote employment, and digitally mediated entrepreneurship even where digital employment opportunities are expanding (Schor, 2017). By contrast, women in higher-income urban environments generally have greater access to devices and high-speed connectivity, although socioeconomic inequalities continue to influence the quality and intensity of digital participation. This finding is consistent with the broader digital-divide literature, which demonstrates that the benefits of digitalisation are unevenly distributed and depend on economic resources, infrastructure, education, and social circumstances.

Importantly, the review suggests that closing the connectivity gap does not automatically eliminate gender inequality in digital employment. A woman may possess a smartphone and internet connection but still lack the skills, time, financial autonomy, or social support required to use those resources productively. For example, access to a smartphone may enable participation in online marketplaces or social-media-based businesses, but intermittent connectivity, limited digital financial skills, or restricted control over income can constrain the economic benefits (Li, 2025). Consequently, gender-inclusive digital policy needs to move from a narrow emphasis on infrastructure provision toward an integrated approach involving affordable connectivity, device ownership, digital skills, cybersecurity, digital financial inclusion, and opportunities for meaningful economic participation.

3.3.2 Gender Pay Gaps and Employment Conditions

The reviewed evidence shows that digitalisation has not eliminated gender pay inequalities. Women remain disproportionately represented in lower-paid occupations and employment arrangements, while men continue to have stronger representation in many highly remunerated technical, managerial, engineering, and digital-specialist positions. Even when women and men possess comparable educational qualifications or participate in the same broad digital sectors, differences in occupational concentration, career progression, working hours, access to leadership positions, and employment contracts can contribute to persistent earnings differences (Islam, 2025). Digital transformation can therefore change the form of gender inequality without necessarily removing its underlying economic foundations.

Platform work provides an important example. Digital labour platforms can lower barriers to entry because workers may be able to obtain assignments without conventional recruitment processes. However, platform-based employment can also be characterised by unstable earnings, limited benefits, variable working hours, and weak employment protections. Women may additionally concentrate in digitally mediated forms of care, administrative, customer-service, content, or routine work that are often less highly compensated than technical occupations (Vassilakopoulou, 2023). The flexibility offered by platform work can consequently represent both an opportunity and a constraint: it may enable labour-market participation for women who face restrictions in conventional employment, while simultaneously exposing them to income insecurity and limited opportunities for advancement.

The findings also indicate that digitalisation can reproduce occupational segregation. High-growth areas such as artificial intelligence, cybersecurity, software engineering, data science, and advanced digital management continue to exhibit gender imbalances, whereas women are more strongly represented in several administrative, communication, education, and service-related digital occupations. Because technological occupations frequently provide higher salaries and stronger career progression, unequal representation in these fields contributes to broader gender income inequality (Judijanto, 2025). Thus, the employment effects of digitalisation depend not simply on how many women enter the digital economy, but also on which occupations they enter, the quality of those jobs, their access to decision-making positions, and their prospects for long-term career advancement.

At the same time, the literature does not support the conclusion that digitalisation inevitably increases gender inequality. Remote employment, online entrepreneurship, digital freelancing, and technology-enabled flexible work can create additional routes into paid employment. Where women have comparable skills, access to technology, bargaining power, and employment protections, digital work may reduce some traditional labour-market barriers (Peebles, 2019). The evidence therefore points toward a conditional relationship in which technological change can reproduce existing pay inequalities when occupational segregation and unequal working conditions remain unaddressed, but can broaden economic opportunities when accompanied by inclusive employment policies and institutional safeguards.

3.3.3 Gender Bias, Discrimination, and Algorithmic Decision-Making

A major finding of the review is that the increasing use of artificial intelligence and algorithmic systems creates new mechanisms through which gender inequality may enter employment decisions. Recruitment platforms, automated screening systems, performance-management technologies, scheduling algorithms, and other forms of workplace automation can influence who is shortlisted, hired, evaluated, promoted, or allocated work. These systems are not

inherently neutral simply because they are technologically automated (Beenackers, 2012). Where algorithms are trained on historical organisational data containing patterns of occupational segregation or discriminatory decision-making, those patterns can potentially be reproduced in automated outputs.

The widely discussed case of an experimental recruitment system developed by Amazon illustrates the concern. Reporting on the system indicated that historical recruitment data reflected a male-dominated technology workforce and that the experimental tool learned patterns that disadvantaged women. Although the system was not adopted as a final recruitment product, the case demonstrates how historical employment inequalities can become embedded in technological systems (Priester, 2016). Similar concerns arise when automated systems use variables that indirectly capture gender, employment gaps, career interruptions, educational pathways, or previous occupational patterns.

Algorithmic management may also generate gendered effects after recruitment. In platform and digitally managed work, algorithms can determine task allocation, working schedules, performance assessments, visibility, remuneration, and access to future opportunities. If the underlying data or performance indicators fail to account for unequal working conditions, workers with different family responsibilities or occupational circumstances may be evaluated according to apparently uniform criteria that produce unequal outcomes (Ngcamu, 2023). Women who experience career interruptions or reduced working hours because of caregiving responsibilities may consequently face disadvantages in systems that reward continuous availability or uninterrupted productivity.

The findings nevertheless suggest that algorithmic discrimination is not inevitable. Transparency, representative training data, regular bias audits, human oversight, impact assessments, explainability mechanisms, and accessible procedures for challenging automated decisions can reduce potential harms (Brodeur, 2021). The key issue is therefore not whether organisations should use digital decision-making technologies in absolute terms, but whether such technologies are designed, tested, monitored, and governed in ways that recognise existing social inequalities and provide meaningful accountability when discriminatory outcomes occur.

3.4 Structural and Social Factors Shaping Gendered Digital Employment

3.4.1 Education, Social Norms, and Gender Stereotypes

Education emerged as a central determinant of gendered participation in the digital economy. The literature consistently associates advanced digital and technical skills with improved access to higher-value digital occupations, yet women and girls remain underrepresented in several STEM and ICT educational pathways. Gender differences can emerge early in educational trajectories through subject selection, confidence in mathematics and computing, exposure to technology, teacher expectations, and perceptions of suitable careers (Pereira, 2019). These differences may subsequently influence university specialisation, vocational training, occupational entry, and career progression.

Gender stereotypes are particularly influential in shaping perceptions of technology-related occupations. Technology, computing, engineering, and advanced mathematics are frequently associated with masculine identities in many social contexts. Such stereotypes can discourage girls from pursuing relevant subjects even when they demonstrate comparable academic ability. The resulting educational segregation contributes to occupational segregation because fields requiring advanced technical qualifications often provide access to some of the fastest-growing and better-paid digital occupations (Platt, 2018). The review therefore identifies gender representation in digital employment as partly a pipeline issue extending from schools and families to universities and workplaces.

Social expectations also influence the perceived appropriateness of particular careers. In contexts where women are expected to prioritise family responsibilities or avoid occupations viewed as traditionally masculine, their educational and career choices may be constrained before they enter the labour market. Conversely, men may experience social pressure to pursue technical and economically prestigious occupations (Landsbergis, 2014). These norms demonstrate that gender inequality in digital employment cannot be explained solely through individual

preferences or differences in skills; choices themselves are shaped by social environments, institutional expectations, role models, and anticipated labour-market experiences.

Interventions that expose girls and women to female technology professionals, provide career guidance, create supportive learning environments, and challenge stereotypes can therefore be important. However, the review suggests that representation initiatives are most effective when combined with structural changes in education and employment (Adams 2011). Encouraging women to acquire digital skills without addressing discriminatory workplace cultures or unequal career opportunities may improve participation without producing equivalent advancement.

3.4.2 Care Responsibilities and Work-Life Inequalities

Unpaid care work represents another major mechanism through which gender inequality is reproduced in digital employment. Across many settings, women continue to undertake a disproportionate share of childcare, household labour, and care for family members. These responsibilities can restrict the amount of time available for education, skills development, paid employment, networking, professional development, and career advancement (Cardella, 2020). The problem becomes particularly significant in occupations where employers reward long working hours, continuous availability, geographic mobility, or rapid responses to work demands.

Remote and flexible employment has the potential to reduce some of these constraints. Women who face difficulties commuting to conventional workplaces may benefit from remote work because it can reduce travel time and provide greater control over working arrangements. Digital entrepreneurship and freelancing can similarly create opportunities for individuals who cannot easily participate in conventional full-time employment (Hilbert, 2011). The reviewed literature therefore identifies flexibility as an important potential mechanism for increasing women's labour-force participation.

Nevertheless, remote work does not necessarily eliminate work-life inequality. Instead, it may relocate paid work into the same physical environment where unpaid domestic work occurs. Women working remotely may experience interruptions from childcare and household responsibilities, blurred boundaries between work and family life, longer working hours, or expectations that they remain available for both employment and domestic duties (Kågesten, 2016). In households where care responsibilities remain gendered, the flexibility of remote work may therefore benefit employers and households without producing equivalent gains in women's career progression. The evidence consequently supports a distinction between flexibility and equality: flexible employment can expand access, but it must be accompanied by equitable sharing of care work and organisational support.

3.4.3 Institutional, Organisational, and Policy Barriers

Institutional and organisational structures strongly influence whether women can translate digital skills into sustainable employment. The review identifies workplace culture, recruitment practices, occupational segregation, unequal access to leadership opportunities, discrimination, limited parental support, and weak accountability mechanisms as recurring barriers (Hakura, 2016). Organisations may formally support gender equality while maintaining informal practices that disadvantage women, such as recruitment through male-dominated professional networks, expectations of constant availability, unequal distribution of high-visibility projects, or limited access to senior decision-making roles.

Leadership representation is particularly important because women remain underrepresented in many senior technology and digital decision-making positions. Limited representation at the top of organisations can affect organisational priorities, mentoring opportunities, career sponsorship, and the visibility of alternative career pathways (Ball, 2021). The review therefore suggests that increasing the number of women entering digital employment is only one component of equality; organisations must also address progression, retention, remuneration, and representation in senior roles.

At the policy level, evidence points to the importance of combining digital-development policies with gender-equality measures. Broadband expansion, affordable devices, digital-skills programmes, STEM education, employment protections, childcare support, parental leave, equal-pay regulation, and anti-discrimination frameworks can operate together to reduce structural barriers (Ngcamu, 2023). National digital strategies that focus exclusively on technological infrastructure may consequently have limited effects on gender equality if they do not address affordability, skills, social norms, care responsibilities, and labour-market institutions.

The evidence also indicates that organisational accountability matters. Gender-disaggregated employment data, pay-gap monitoring, transparent promotion criteria, bias assessment of recruitment technologies, and regular evaluation of diversity outcomes can make inequalities more visible (Brodeur, 2021). Such measures are particularly relevant as organisations increasingly use artificial intelligence and algorithmic systems in human-resource management. Effective institutional responses therefore require both conventional gender-equality mechanisms and new forms of digital governance.

3.5 Strategies for Advancing Gender Equality in the Digital Economy

3.5.1 Gender-Inclusive Digital Skills and Education

The review identifies inclusive digital education as one of the most important strategies for improving women's participation in the digital economy. Programmes providing girls and women with training in coding, data analysis, cybersecurity, artificial intelligence, digital entrepreneurship, and other advanced technologies can increase access to occupations that have traditionally been male dominated (Pereira, 2019). Evidence from skills-development initiatives indicates that training can improve digital competence and employability, particularly when programmes combine technical instruction with practical projects, career guidance, mentoring, and links to employers.

The findings suggest that effective interventions should begin before labour-market entry. School-based programmes that introduce girls to computing and STEM subjects can influence educational choices before occupational stereotypes become deeply established. At tertiary and professional levels, scholarships, internships, apprenticeships, boot camps, and industry partnerships can provide women with practical experience and professional networks (Platt, 2018). Mentorship is particularly relevant because women entering male-dominated technology fields may benefit from access to experienced professionals who can provide career guidance and support.

However, training programmes alone cannot resolve structural inequality. A woman may successfully complete a coding or AI programme but still encounter discriminatory recruitment, unequal pay, limited promotion opportunities, or incompatible care responsibilities. The evidence therefore favours integrated interventions that connect skills development with employment pathways, entrepreneurship opportunities, financial support, mentoring, and institutional reform (Landsbergis, 2014). Digital-skills policies should also recognise differences among women according to income, age, disability, geography, education, and access to devices and connectivity.

3.5.2 Inclusive Workplaces and Digital Employment Policies

The reviewed literature identifies workplace reforms as essential for converting women's participation into sustained and equitable digital employment. Equal-pay policies and transparent salary structures can help organisations identify and address unexplained earnings differences. Anti-discrimination procedures, fair recruitment systems, objective promotion criteria, and mechanisms for reporting workplace discrimination can further strengthen employment equality (Adams Jr, 2011). These measures are particularly important in technology-intensive organisations where informal networks and historically male-dominated cultures may influence recruitment and advancement.

Flexible work arrangements can also contribute to more inclusive employment when implemented alongside meaningful organisational support. Remote and hybrid work, flexible schedules, childcare assistance, parental leave, and predictable working arrangements can reduce some barriers associated with caregiving (Cardella, 2020). Nevertheless, organisations need to ensure that flexible workers are not penalised in promotion, performance

evaluation, compensation, or access to important assignments. Flexibility should therefore be treated as an organisational design issue rather than simply an individual accommodation.

Mentoring, sponsorship, leadership development, and career-development programmes can address inequalities in progression. Mentoring can provide advice and professional support, while sponsorship can help employees gain access to influential networks and advancement opportunities. Organisational accountability is equally important. Employers can monitor gender-disaggregated recruitment, retention, promotion, compensation, and leadership data to identify persistent disparities (Hilbert, 2011). In organisations using AI-enabled recruitment or performance-management systems, regular algorithmic audits and human review can provide additional safeguards against discriminatory outcomes.

3.5.3 Future Directions for Gender-Equitable Digital Employment

The overall findings demonstrate that gender inequality in the digital economy is multidimensional and cannot be reduced to a single digital-access gap. Inequalities in connectivity interact with differences in education, income, occupational segregation, unpaid care work, workplace culture, leadership representation, algorithmic decision-making, and employment protections (Kågesten, 2016). Digitalisation can create new opportunities for women through remote work, online entrepreneurship, digital platforms, and emerging occupations, but these opportunities do not automatically translate into equal economic outcomes. The central pattern identified in the review is therefore one of simultaneous opportunity and reproduction of inequality.

Artificial intelligence and automation represent particularly important areas for future research. As organisations increasingly automate recruitment, performance assessment, scheduling, customer interaction, and other employment processes, researchers need stronger empirical evidence concerning gendered outcomes across different occupations and countries (Hakura, 2016). Future studies should move beyond documenting whether algorithmic systems are biased and examine how bias develops, how it interacts with organisational practices, and which governance mechanisms effectively prevent discriminatory outcomes.

Platform and remote work also require further longitudinal research. Existing studies frequently examine participation or working conditions at particular points in time, whereas less is known about long-term earnings, career progression, occupational mobility, retirement security, and the cumulative effects of flexible or platform-based employment. Research should also pay greater attention to intersectionality by examining how gender interacts with socioeconomic status, geography, disability, age, education, and other forms of disadvantage (Ball, 2021). Evidence from low- and middle-income countries remains particularly important because much of the digital-economy literature is concentrated in high-income settings.

For employers, the evidence points toward priorities that include transparent recruitment and pay systems, gender-responsive career development, inclusive leadership, family-supportive employment practices, algorithmic accountability, and systematic monitoring of employment outcomes. Educators should strengthen girls' and women's access to advanced digital and STEM education while challenging gender stereotypes and providing meaningful links between training and employment (Priester, 2016). Governments should combine universal digital infrastructure with affordability measures, gender-inclusive skills programmes, labour protections, childcare and parental-support policies, and effective enforcement of equality legislation. Researchers should continue developing longitudinal, comparative, and intersectional evidence that can distinguish interventions that increase participation from those that also improve job quality, earnings, retention, and advancement.

4. Conclusion

This systematic review concludes that the digital economy has created important opportunities for women and men to access new forms of employment, develop digital skills, participate in remote and platform-based work, and pursue greater flexibility in combining paid employment with other responsibilities; however, these opportunities remain unevenly distributed because persistent gender inequalities continue to shape participation, job quality, earnings, career advancement, and access to digital technologies. The evidence indicates that women remain

disproportionately affected by unequal access to digital infrastructure and skills, occupational segregation, unpaid care responsibilities, gender pay gaps, limited representation in technology-intensive occupations and leadership positions, and risks associated with algorithmic management and platform work. At the same time, digitalization can support women's economic participation when accompanied by affordable connectivity, relevant digital and technical skills development, inclusive workplace practices, social protection, transparent algorithmic systems, and policies addressing care responsibilities and discrimination. Overall, achieving a more equitable digital labour market requires coordinated interventions from governments, employers, educational institutions, technology companies, and labour organizations to ensure that digital transformation expands employment opportunities without reproducing existing gender inequalities. Future research should further examine intersectional differences across income groups, regions, occupations, and socioeconomic backgrounds to identify context-specific strategies for achieving inclusive and sustainable employment in the evolving digital economy.

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