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AI-ENABLED DIGITAL LEADERSHIP SYSTEMS AND THEIR IMPACT ON DECISION-MAKING PROCESSES, COMMUNICATION NETWORKS, AND ORGANIZATIONAL PERFORMANCE IN SAUDI ARABIA

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A B S T R A C T

This study examines the implementation of AI-enabled digital systems in leadership and decision-making processes within industrial organizations in Saudi Arabia. The research focuses on how advanced digital technologies influence decision support, communication networks, and overall organizational performance. A systematic literature review was conducted following the PRISMA methodology, analyzing relevant studies on AI applications in leadership and organizational systems.

The findings indicate that AI-driven digital platforms can significantly enhance leadership effectiveness, improve real-time decision-making, strengthen internal communication channels, and increase operational efficiency. Particular emphasis is placed on the potential of these systems to support greater inclusion of digitally competent leaders, leading to improved innovation and collaborative work environments. However, several technological, cultural, and organizational barriers still limit widespread adoption in Saudi industrial settings.

The study provides practical recommendations for the integration of AI-based decision support systems in industrial engineering and management contexts to achieve sustainable performance improvements.

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1. INTRODUCTION

Saudi Arabia's accelerated digital transformation driven by Vision 2030, widespread 5G deployment, and rapid AI adoption-has reshaped organisational life faster than any regulatory or cultural reform (Saudi Arabia, 2016; Meharunisa et al., 2024). These technological developments intersect with a second major shift: the expanding participation of women in leadership roles, supported by landmark policy changes and evolving social norms (Valdes et al., 2022; Zografou, 2023). Together, they create an unprecedented environment for

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examining how technology and gender-specific leadership styles co-evolve, influence decision-making heuristics, and ultimately redefine what "effective" organisations look like in the Gulf context (Valdes et al., 2022; Alex-Omiogbemi et al., 2024; Klein et al. (2025).

At the strategic level, AI-enhanced analytics platforms now do more than process data; they actively influence leadership thinking by revealing patterns, simulating scenarios, and automatically generating recommendations in real time. However, emerging evidence indicates that male and female leaders may evaluate algorithmic advice differently, prioritising relational cues, risk thresholds, or consensus-building to varying extents (Newstead, Eager, & Wilson, 2023; Baxtiyorovich, 2024). These nuances are significant: they affect capital allocation, HR policies, and even responses to crises, thereby establishing a direct connection between micro-level cognitive processes and macro-level organisational performance (George, 2024; Flamini et al., 2024).

Communication channels have likewise been disrupted. Cloud collaboration suites, immersive mixed-reality meeting rooms, and data-rich dashboards compress hierarchical distances while amplifying transparency. However, scholars have begun to note subtle gendered dynamics in digital spaces, ranging from differing levels of self-advocacy on enterprise social networks to distinct mediation styles in virtual conflict resolution (Angelakis et al., 2024; Ortiz Osejo et al., 2025). Understanding how Saudi women leverage or resist these tools relative to their male counterparts sheds light on the culturally contingent interplay of authority, credibility, and technological affordances (Gren, 2025; Gumucio et al., 2020).

As digital workflows evolve, organisational effectiveness-traditionally evaluated by cost efficiency, innovation speed, and employee engagement, requires recalibration. Metrics now need to include algorithmic fairness, cyber-resilience, and the inclusiveness of socio-technical systems (Newstead, Eager, & Wilson, 2023; Fox-Robertson & Wójcik, 2024). This review combines interdisciplinary scholarship, spanning information systems, gender studies, and Middle East management research, to map current knowledge, identify conceptual blind spots, and propose an integrated framework for future research (Valdes et al., 2022; Yang, Subramanian, & Al Harthy, 2024).

This review aims to measure the impact of emerging technological advancements on decision-making strategies, communication channels, and organisational effectiveness in the intersection of technology and gender-specific leadership in Saudi Arabia.

This paper is organised as follows: After this introductory section, the methodology followed to select the papers for this review is outlined. The Results section describes each selected paper. The Discussion section integrates the findings from this review with some numerical trends. After the Conclusion section, the limitations and recommendations for research and practice are provided.

2. METHODOLOGY

The aim was split into three as follows, to facilitate literature search-

a. To review how the intersection of technology and gender-specific leadership impacts decision-making strategies.
b. To review how the intersection of technology and gender-specific leadership impacts communication channels.
c. To review how the intersection of technology and gender-specific leadership impacts organisational effectiveness.

For each aim, Google Scholar was searched for the relevant papers. The identified documents were screened and selected using a PRISMA flow diagram, applying the inclusion and exclusion criteria listed in Figure 1 and Table 1. For each aim, 10 papers were targeted. Thus, the total reviewed papers was 30.

Besides, an assessment of the quality of papers was made based on the following criteria:

1. Well-defined aim.
2. Appropriateness of the methodology.
3. How the findings were derived and discussed.
4. Whether any recommendations are given for practice, research, policies or strategies at various levels.
5. Whether any limitations are mentioned.

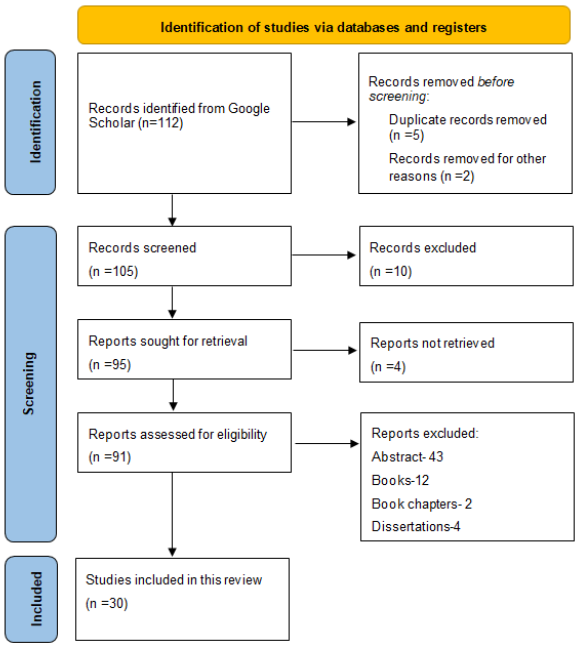


Figure 1. PRISMA diagram

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria	Comments
Full-text papers	Abstracts	Abstracts may not contain all the information required.
Papers in English	Papers in other languages	There is a risk of distortion even with the best translation.
Published during 2020-2025.	Earlier papers	To reflect the recent trend.
Only research papers and reports.	All others, including books, book chapters, dissertations, and comments on other papers.	The exclusions are based on the full-text availability and the degree of independent work.

One point was awarded for meeting any criterion in full, zero for not meeting any criterion and less than one point if any criterion is partially met. Thus, the values can range from zero to five.

The next section, Results, describes the papers selected under the three aims listed above.

3. RESULTS

3.1 Aim a: The intersection of technology and gender-specific leadership impacting decision-making strategies

As artificial intelligence, data analytics, and digital platforms become integral to strategic decision-making, the interplay between technological affordances and leadership styles warrants critical examination. Within this evolving context, gender-specific leadership emerges as a pivotal lens through which decision-making strategies can be understood and optimised.

Existing scholarship has highlighted nuanced differences in how male and female leaders engage with technology-driven environments, particularly in domains such as crisis management, innovation adoption, and stakeholder engagement. These differences are not merely rooted in biological or sociocultural constructs but are increasingly shaped by access to digital tools, algorithmic biases, and the design of decision-support systems. Moreover, the intersection of gender and technology introduces complex dynamics that influence strategic priorities, ethical considerations, and organisational resilience.

This section explores the intersection of technology and gender-specific leadership, focusing on how these dimensions collectively shape decision-making strategies across sectors. In doing so, it contributes to a more inclusive and context-aware understanding of leadership in the digital age.

The EU guidelines (Horizon Europe 2020) referring to the integration of the gender dimension in research projects of Cluster 4 include a human-centred paradigm, technology with human-centred approaches, engagement with expertise in social sciences and humanities, increased acceptance of robotics and other AI technologies, interdisciplinary approaches to human factors, and human-centred approaches to sustainable development. However, in some European countries, gender gaps exist in digital skills, at least to a small extent. This is more evident in the case of STEM education. In job markets, gender segregation is observed in the case of the ICT and engineering sectors. The Gender Equality Index (GEI) is a method of measuring gender equity. In the case of AI technologies, developers need to ensure inclusivity when designing digital assistants and chatbots. Over-feminisation of these characters should be avoided. Otherwise, there will be a tendency for users to rate male AI higher than female AI by users. Though legal and policy frameworks exist in many countries, the representation of women in leadership positions is still low. Gender diversity in boards and organisational performance are correlated. National culture can affect gender parity in leadership positions. Gender gaps in remuneration and other benefits also exist when equally qualified men and women are compared. The difficulties of working women in balancing work and life are aggravated when they are paid less. AI systems of recruitment might be biased against women. There is a bias among women as digital technologies lead to employee polarisation towards service-related casual, freelance and self-employment. In space exploration, more men are recruited than women. Based on these analyses, Zografou (2023) offered a few recommendations for research and practice.

The World Economic Forum reports (WEF, 2025) that progress toward closing the global gender gap remains gradual, with no nation having yet achieved complete gender parity. In the 2025 rankings, Iceland (92.6%) retained its leading position, followed by Finland (87.9%), Norway (86.3%), and Sweden (81.7%), all of which have consistently placed within the top 10 since the index's inception in 2006. Notably, the United Kingdom (83.8%) and the Republic of Moldova (81.3%) advanced in the 2025 edition relative to 2024, securing fourth and seventh positions, respectively. Germany (80.3%) and Ireland (80.1%) also entered the top 10, marking their seventh and eighteenth appearances. Meanwhile, New Zealand (82.7%) and Namibia (81.1%) have maintained their top 10 status since 2021. On the other hand, Pakistan, Chad and Iran scored the lowest (0.568 to 0.576) in this respect.

Promoting gender diversity within compliance and financial risk management enhances decision-making quality, strengthens risk assessment processes, and fosters organisational innovation. A diverse workforce contributes to more ethical governance, improved

regulatory compliance, and greater resilience against emerging risks. However, persistent barriers to gender inclusion stem from systemic inequities, entrenched workplace biases, and prevailing cultural norms. Unconscious bias, often manifesting through stereotypical assumptions about women's roles and competencies lead to disproportionate scrutiny of their performance. This, in turn, limits access to mentorship and advancement opportunities, thereby reinforcing structural exclusion. (Alex-Omiogbemi, Sule, Omowole, & Owoade, 2024). The authors offered some practice recommendations.

George (2024) pointed out that only 28% of women are represented in STEM fields. The gap is wide in the case of coloured women (only 2%). The pronounced gender disparity in the technology sector perpetuates broader inequalities in leadership representation and compensation. Currently, women occupy only about 24% of leadership positions in tech and earn approximately 14% less than their male counterparts. If left unaddressed, this imbalance could result in significant economic repercussions, depriving nations of critical opportunities for innovation, enhanced productivity, and optimal talent utilisation. Many countries are implementing various steps to improve the situation. However, due to their low representation in the metaverse, these measures are inadequate, as only 10% of them occupy leadership positions in firms involved in developing such tools. The author offered some recommendations for political, educational and corporate levels.

From a systematic review of 58 papers, Adhikari and Ghimire (2025) concluded that women frequently shoulder essential responsibilities, such as collecting water, sourcing fuel, and producing food, yet face compounded challenges due to restricted access to land ownership, financial capital, and participatory decision-making forums. In contrast, men are more vulnerable to employment disruptions in climate-sensitive industries, resulting in economic instability and transformations in conventional familial roles. This review is anchored in the core hypothesis that rectifying gender inequities in climate adaptation and mitigation strategies is pivotal not only for advancing social justice but also for strengthening the overall efficacy of climate interventions. The authors gave some policy and strategy recommendations for institutional commitment and overcoming barriers.

Berezhna, et al. (2025) used a qualitative review of 94 papers to investigate how educational technology can support gender mainstreaming in project management, particularly through training strategies for local development initiatives. The authors analysed the evolution of digital platforms for gender-focused education, e-learning methodologies, case studies, and evaluation frameworks. While blended and virtual learning models offer potential, challenges persist in creating inclusive, culturally sensitive digital training that effectively advances gender equity. Some strategic recommendations were given for educational institutions, project management bodies, and development agencies to harness technology for more impactful gender-sensitive training. The limitations mentioned are language bias due to selecting only English papers, publication bias due to relying on published papers only, context-dependent nature of the topic, inadequate quality of some papers, and temporal limitation due to rapid evolution of educational technology.

The study by Baxtiyorovich (2024) investigated gender-based differences in entrepreneurial decision-making within a shifting economic environment. The author integrated quantitative survey data from 500 Uzbek SME representatives with an equal number of males and females with qualitative semi-structured interviews with 20 SME managers (10 male and 10 female) to understand how gender influences strategic choices, risk appetite, and management practices. The results indicated that female entrepreneurs exhibit notably different patterns in risk assessment, resource distribution, and leadership behaviour compared to male entrepreneurs, highlighting the impact of gender-specific dynamics on business decision-making. The implications of the study for policymakers, business support organisations, and entrepreneurs in Uzbekistan were discussed.

A Gender-Responsive Research and Innovation (GRRI) framework was proposed by Nikghadam-Hojjati, et al. (2025) to address gender bias in society, based on a systematic review of 18 papers. Its successful implementation depends on recognition of barriers, keeping informed about the relevant information, and developing effective strategies for a fair and responsive society. The authors identified 10 concerns and measures critical to GRRI initiatives and strategies to address them and 18 successful initiatives. The 10 concerns were the lack of a gender perspective, male domination, gender bias, limited participation by women, inadequate funds, lack of coordination, lack of research capacities, lack of appropriate data, limited knowledge of gender dynamics, institutional issues and barriers. The 18 initiatives are related to research, industry and regulations. The limitations include that the issues, barriers, and initiatives discussed in this study were drawn from selected countries and disciplinary areas. Therefore, the findings are not universally prescriptive.

Kark and Buengeler (2024) categorised feminist theories into four waves: Gender Reform Feminism (“fixing the women”), aligning with *liberal feminism*, aiming to integrate women into existing systems through equal rights and opportunities; Gender Resistance Feminism (“the female advantage”), reflecting *radical feminism*, emphasising women's unique strengths and challenging patriarchal structures, Gender Rebellion Feminism (“how is a wo(man) defined”), drawing from *postmodern and intersectional feminism*, questioning fixed gender

identities and highlighting diverse experiences, and Gender Digital Feminism ("hashtag and clicktivism revolution"), focusing on *cyber activism*, social media movements, sexual violence, and evolving forms of intersectionality. The authors noted that concepts from the first two waves of feminist thought remain prevalent in contemporary leadership research. They advocated for expanding into new areas by incorporating more recent feminist perspectives in the exploration of leadership and gender. Additionally, they emphasised that within a gendered society, leadership theories can both reinforce existing social and gender hierarchies and serve as a foundation for charting innovative paths in future research. Different leadership styles are attributed to these theories. Research on gender-related aspects of these theories is inadequate. The authors noted that most research done so far is related to the first two waves of feminism. Thus, there is a need for more research on the last two waves of feminism. Gender gaps are shown by the continued disparities between the two genders in reaching leadership positions. Research on the combination of all theories is also essential.

Adefila, Ajayi, Toromade, and Sam-Bulya (2024) conducted a sociological review of gender equity in agricultural development using a review of the literature and case studies from Africa, Asia and Latin America. Gender disparities in agriculture persist, especially in regions where cultural and structural barriers restrict women's roles and decision-making power. Evidence from Africa, Asia, and Latin America shows that gender-responsive policies, such as equitable land rights, access to resources, and women-focused training, can significantly boost women's agricultural participation and drive socio-economic progress. Drawing on these findings, recommendations were made for the U.S. to include enhancing women's access to land, credit, and technology; promoting inclusive decision-making; and reducing rural labour burdens through improved childcare and healthcare services. Future research should explore how evolving social norms shape women's agricultural involvement, how gender-based programs shift power dynamics, and what sociological factors influence the long-term success of inclusive policies.

Akinwale (2023) noted that the employment conditions of Sub-Saharan women are pathetic. Women occupy only 23% of the leadership positions in the region. Using a review of the literature and case studies of Rwanda, Ghana and Kenya, the author listed the strategies to be used for empowering women. These included education and skill development, economic empowerment, ensuring health and reproductive rights, political participation, legal reforms, community engagement and advocacy, and the collection of data and regular monitoring. However, there are the challenges of cultural norms, gender stereotyping, discrimination against women, gender-based violence, lack of resources, access to opportunities, institutional barriers, gender gaps, limited health and reproductive rights, educational disparities, and unpaid care work. To address them, the government, NGOs, civil societies, the private sector and international organisations need to collaborate. The author has given their recommendations along these lines. Some lines for future research are also mentioned.

3.2 Aim b: The impact of the intersection of technology and gender-specific leadership on communication channels

The convergence of technological innovation and gender-specific leadership has catalysed significant transformations in organisational communication channels. Digital platforms, AI-mediated systems, and remote collaboration tools become integral to professional environments. Leadership styles, often shaped by gendered norms and socio-cultural expectations, play a pivotal role in influencing how communication is structured, interpreted, and disseminated. This intersection has garnered increasing scholarly attention, particularly in the context of leadership efficacy, inclusivity, and the evolving nature of workplace discourse.

Existing literature has explored gendered leadership through various lenses, including transformational versus transactional styles, emotional intelligence, and participatory decision-making. Parallel research in communication studies has examined how technology reconfigures interpersonal dynamics, flattens hierarchies, and introduces algorithmic gatekeeping. However, the intersection of these domains-specifically, specifically how gendered leadership traits interact with digital communication infrastructures, remains under-theorised. Studies have begun to highlight disparities in visibility, authority, and engagement across gender lines in virtual settings, yet comprehensive frameworks that integrate technological affordances with gendered leadership paradigms are still emerging.

A sentiment analysis of social media data and university websites was conducted by Angelakis, et al. (2024) to evaluate the communication styles of rectors and vice-rectors of German public universities during the COVID-19 pandemic. The analysis covered 101 rectors (29 female and 72 male) and 335 vice-rectors (133 female and 302 male). The authors aimed to investigate the influence of gender on leadership communication. Out of 2772 communications, 787 belonged to female leaders and 1985 to male leaders. Besides university websites, Google News and Twitter were the most commonly used communication channels. Women in leadership roles were found to use more positively framed communication and showed a marked preference for transformational leadership approaches, while their male counterparts more frequently adopted transactional styles. Notably, leaders of both genders demonstrated considerable empathetic concern for stakeholders, which collectively enhanced the overall tone of organisational communication. The limitations of this study include the

potential inability to capture all online interactions despite the large sample size. The qualitative data were in German, and translation limitations might have affected the accurate interpretation of sentiment. Some recommendations for future research have been given.

Gumucio, Hansen, Huyer, and Van Huysen (2020) systematically reviewed 43 papers to assess the existing insights into gender-related disparities in accessing, utilising, and benefiting from rural climate services, to examine challenges to gender equality and identify strategies to enhance the responsiveness of these services to the distinct needs of rural women and men. Gender disparities in access to climate information are shaped by unequal participation in group processes, limited access to ICTs, and socio-cultural norms governing labour roles and decision-making. These factors constrain women's ability to obtain and act on weather and climate data. Literature highlights the importance of integrating women's networks into communication strategies and designing ICTs aligned with women's preferences. Advancing gender-responsive climate services requires addressing women's specific information needs through cross-sectoral collaboration. Key research areas include assessing the role of women's and mixed-gender groups in improving access, evaluating effective communication methods, and linking climate services to intra-household decision-making dynamics.

To examine the impact of social media on interpersonal communication patterns in Jordan and determine whether there are gender differences, Zibin, Al-Sabatin, and Altakhaineh (2025) used a mixed approach. A survey of 50 (24 men and 26 women) Facebook users in Jordan and two semi-structured focus group discussions were conducted with 10 randomly selected men and 10 women. The survey showed significant gender differences in terms of nonverbal communication and communication roles. However, no significant differences were found in verbal communication, listening, feedback, context, communication channels, and conflict resolution. Focus groups showed how cultural and societal norms, particularly those related to gender roles, influence interactions on social media. Global influences affected the communication dynamics of the participants. The authors used Gendered Theory to explain the findings. The small sample sizes, the possibility of response biases due to self-reports, and focusing on university students in Jordan were mentioned as the limitations.

Uniyal and Mirza (2024) noted that the rise of OTT platforms has significantly expanded the global exchange of gender-related perspectives by removing geographic barriers and amplifying diverse voices. Series such as Delhi Crime (India), Coisa Mais Linda (Brazil), King of Boys (Nigeria), and Followers (Japan) challenge conventional gender roles and highlight socio-cultural struggles for equality. Similarly, Quicksand (Sweden), Stateless (Australia), and Ethos (Turkey) offer nuanced portrayals of gender justice, immigration, and the tension between tradition and modernity. The digital era has transformed content creation and consumption, with platforms like Netflix, Hulu, and Amazon Prime democratizing access and storytelling. This shift empowers creators to explore complex gender themes beyond the limitations of traditional media and censorship, fostering richer, more inclusive narratives that foreground women's experiences and broader gender dynamics.

Boehncke (2025) conducted structured interviews to analyse the communication perceptions and expectations of 15 top talents when making employer decisions. The results of these were compared with the expectations and intentions of 15 HR managers responsible for programs and communications. The responses of HR managers only partially align with the nuanced communication preferences of top-tier talent. Beyond program-specific CSR messaging, corporate communications exhibited significant room for improvement in both delivery style and structural organisation. Notably, emerging leaders actively pursue CSR-related information during recruitment and engage with corporate and brand communications as a key source for such insights. The study highlights actionable implications for corporate communications, tailored to gender and industry contexts, in both content and delivery methods. Organisations should articulate clear strategies for attracting future leadership talent, while also showcasing initial efforts and commitments, thereby signalling a more deliberate and aspirational stance. As this study was conducted during the COVID-19 pandemic, the merits of face-to-face interviews could not be achieved.

In healthcare, gender-specific medicines can address gender disparities in clinical manifestations, outcomes, treatment, and prevention of disease. However, their adoption rates are poor. Baum, Baumann, and Batzel (2024) used Innovation diffusion process theory to examine the spread of information about gender-specific medicine in online networks. The authors analysed 15061 tweets (2695 original and the rest replies, mentions, retweets, etc.). The analysis reveals a network characterised by distinct sub-communities with minimal cross-group interaction, where discourse is primarily led by medical professionals. These patterns indicate that gender-specific medicine is likely in its nascent phase, centred around the exchange of expertise and information. Theoretical and practical implications have been discussed. Some limitations were mentioned. The dataset for this study is based on selected hashtags and search terms used during the data collection process. Despite employing a comprehensive search strategy to identify relevant keywords, some infrequently used hashtags may have been overlooked, and certain search terms may have retrieved tweets on adjacent or related topics. The findings are time-dependent, as the data were collected during the COVID-19 pandemic. Only Twitter was considered, which could have missed data from other social media. Social media may not represent the public.

To examine the impact of workload on leadership roles within the Austrian IT sector, while also paying attention to differences between genders, Gren (2025) surveyed 200 IT professionals with or without personal responsibility. The modified German version of the Copenhagen Psychosocial Questionnaire (COPSOQ) was used as the primary tool to measure the dimensions such as demands, influence, interpersonal relations, work interface, and conflicts. Individuals with personnel responsibility consistently reported lower scores in the domains of demands and influence, indicating difficulties in navigating emotional or qualitative pressures and a restricted sense of autonomy. Although less pronounced, this pattern extended to the work interface dimension, reflecting underlying apprehensions about job security among those in leadership roles. Gender-based analysis further revealed that male respondents experienced fewer workplace conflicts than their female counterparts, underscoring gendered disparities in the perception of occupational challenges. Some recommendations for future research have been given.

The study by Ortiz Osejo, Arrechea, and Alvarado (2025) explored the role of Digital Community Centres (DCCs) in fostering empowerment among indigenous Mayan women in Northern Huehuetenango, Guatemala. Despite the persistent exclusion of rural and indigenous populations from digital advancements, the DCC initiative seeks to bridge this divide by offering internet connectivity, foundational computer literacy programs, and educational workshops focused on promoting positive masculinities. The authors used a survey of 43 (10 men and 33 women) Mayans and 10 semi-structured virtual focus groups (Google Meet) comprising 33 Mayan women and 10 Mayan men from 10 different communities to achieve thematic saturation. For the survey, the Gender Equitable Men (GEM) scale and the Gender Equality (GNDR-4) scale were used for baseline (29 women) and endline (32 women) surveys. The endline survey was conducted only with 32 women. The intervention comprised a three-month digital skills program and workshops on positive masculinities aimed at reshaping gender role perceptions. In culturally traditional communities, discussions often biologically define "women," reflecting prevailing norms. The masculinities training deconstructed hegemonic ideals, promoting shared responsibility, respect for women's rights, and the importance of everyday actions that advance social justice. Through participatory methods, it emphasised how entrenched gender roles sustain inequality and how their transformation can lead to more equitable, non-violent relationships. Significant improvements were observed in women's digital skills after the short training period. These gains enabled participants to reduce travel time for tasks such as processing government documents and to launch small-scale economic initiatives. Participants who attended the positive masculinity training, men and women, reported more equitable attitudes toward women's leadership and decision-making. Some policy recommendations have been given. The small sample sizes were due to the remote nature of the study area and logistical challenges, constraining the ability to gather a larger dataset.

The study by Habes, Alhazmi, Elareshi, and Attar (2024) explored the determinants of social TV content selection, focusing on the role of artificial intelligence (AI) and related influencing factors, with gender positioned as a mediating variable. The research employed an online self-report survey of 300 students across two randomly selected public universities in Irbid, Jordan. For this survey, active users who have an active subscription to one of the major subscription video on demand (SVOD) services, such as Netflix, Amazon Prime Video, Disney, or Hulu, were included. Findings indicate that AI facilitates key functions such as information acquisition, social awareness, and knowledge exchange, which in turn shape user attitudes and influence content preferences on social TV platforms. Both AI capabilities and user attitudes emerged as significant predictors of content selection, while gender mediated the relationship by modulating AI adoption and attitudinal dynamics. Overall, AI enhances user experience by streamlining access to preferred content, improving usability, and strengthening recommendation systems, ultimately fostering greater engagement, satisfaction, and positive perceptions of technology. Some recommendations for future research were given. Focusing only on Jordanian students, self-report bias and the cross-sectional nature of the study have been mentioned as the limitations.

Despite the rapid growth of the fintech sector in the UK, women remain significantly underrepresented, comprising only 12.2% of the 3,017 fintech startups, occupying just 17% of senior leadership positions, and accounting for 28% of the overall workforce. Filipovska, et al. (2024) explored the potential of the EU Platform Work Directive regulatory framework governing digital platform operations to advance gender equity in fintech by fostering greater inclusion of women as leaders, employees, and users. In addition to a comprehensive literature review, we conducted an online survey via Google Forms with 125 participants, including researchers, entrepreneurs, students, and digital platform workers, to assess perceptions of gender balance in fintech. Findings indicate that fintech holds considerable promise for narrowing gender disparities in financial services and enhancing financial inclusion. By leveraging digital financial tools, fintech can extend access to underserved populations traditionally excluded from conventional banking systems. Moreover, it offers innovative mechanisms for assessing creditworthiness among individuals with limited or no formal credit history, thereby facilitating more equitable financing opportunities, particularly for women-led households and enterprises.

3.3 Aim c: The impact of the intersection of technology and gender-specific leadership on organisational effectiveness

The convergence of technological innovation and gender-specific leadership dynamics is reshaping the contours of organisational effectiveness in the digital age. As enterprises increasingly integrate advanced technologies, ranging from artificial intelligence and data analytics to platform-based work systems, the nature of leadership is undergoing a parallel transformation. Within this evolving landscape, gender-specific leadership styles and the broader inclusion of women in strategic decision-making roles have emerged as critical factors influencing organisational adaptability, innovation capacity, and performance outcomes.

Existing literature underscores that diverse leadership teams, particularly those inclusive of women, tend to foster more collaborative cultures, enhance stakeholder engagement, and drive ethical governance. Simultaneously, technology-enabled environments offer new avenues for redefining leadership practices, flattening hierarchies, and enabling data-driven decision-making. However, the intersection of these two domains-technology and gendered leadership-remains underexplored in terms of its direct and systemic impact on organisational effectiveness.

Using a systematic review of 168 papers, Valdes, Thomason, Bentancor, Jeria, and Troncoso (2022) identified two main forms of conceptualising technology that emerged: technology as culture and technology as tools. The first category of literature focuses on contexts where technology significantly shapes production processes and, by extension, exerts a strong influence on organisational culture. Within this framework, scholars examine technology-driven companies, occupational roles, and entire economic sectors through a gendered lens. The second category conceptualises technology as a set of tools that individuals utilise to carry out their tasks. These tools may be physical, software-based, or comprise integrated systems involving hardware, software, procedures, and human interaction. This perspective is employed to investigate gendered patterns in the adoption and use of technology in the workplace. Scope for future research was also discussed. The limitations of considering only articles published from 2011 to 2021, missing the latest trends, selecting only papers in English, and possible inaccuracies in paper selection and data extraction were mentioned.

Generative AI systems can inadvertently reinforce gendered leadership biases. To investigate this, Newstead, Eager, and Wilson (2023) used Wordplay.ai to generate narratives describing good and bad leaders across gender categories-women, men, and neutral-spanning historical, contemporary, and future contexts. By producing multiple outputs for each prompt, the authors analysed over 50 narratives (totalling 40,000+ words) to identify recurring themes and assess alignment with known gender stereotypes. Each narrative followed a structured format, enabling systematic comparison. The findings reveal that AI-generated content often mirrors entrenched biases, posing risks to equitable leadership representation. However, when designed and deployed responsibly, AI also holds the potential to challenge these biases and foster inclusive organisational cultures. Diverse leadership across gender, race, age, and other dimensions correlates with improved decision-making, innovation, and long-term performance. Ensuring that AI supports fairness and inclusion is essential for building just and equitable workplaces where all individuals can thrive. Some recommendations for research and practice have been given.

In an investigation on the role of women's HRM leadership in Italian family SMEs, Flamini, Morelli, Gnan, and Cori (2024) used a survey of 623 SMEs. The data were analysed in two ways: a whole sample analysis and fuzzy set qualitative comparative analysis (FsQCA) of four sub-samples (combinations of male/female CEOs and male/female HR directors). Gendered leadership approaches shaped the selection of particular HRM practice bundles, which in turn impacted the performance of family-owned SMEs. Within the social dynamics of family businesses, women often adopted stewardship-focused HRM strategies to align with prevailing gender norms. This tendency underscores their pivotal role in enhancing organisational outcomes through the use of employee-centric HRM practices that foster satisfaction and long-term retention. Some theoretical and practical implications of these findings have been discussed. The limitations include a single focus on HR in family SMEs of a specific country, constraints of the FsQCA method, and the analysis of female presence in top management did not differentiate between family and non-family members.

The accelerating advancement of AI, machine learning, and deep learning technologies has triggered a fundamental transformation in warfare, posing significant threats to global security. Despite existing regulatory frameworks, NATO continues to grapple with persistent issues of gender-based discrimination, systemic bias, and inequality, manifesting across dimensions such as race, ethnicity, sexual orientation, and the exploitation of marginalised groups, including incidents of sexual harassment and assault. These challenges underscore the urgent need for a strategic overhaul: one that moves beyond the historically white male-dominated military paradigm toward genuinely inclusive defence architecture. Achieving long-term equity across agencies and gender identities requires more than doctrinal reform or training interventions; it demands a profound cultural transformation within defence institutions. In response, Trochowska-Sviderok, Masakowski, McFate, and Holohan (2024) advocated for ecofeminism as a foundational framework to address

these intersecting crises and to guide the evolution of a more just and secure global order.

To critically examine the gender disparities embedded within the FinTech sector, Fox-Robertson and Wójcik (2024) employed a mixed-methods research design, integrating quantitative data from 100 leading FinTech firms with qualitative insights from 15 in-depth interviews conducted with industry professionals during the latter half of 2021. The findings reveal that women in FinTech confront a 'triple glass ceiling', a compounded barrier arising from entrenched gender inequalities across financial, technological, and entrepreneurial domains. Within the sample, women constitute only 7.69% of co-founders, 18.2% of executive committee members, and lead a mere 4.04% of FinTech companies. These figures reflect the pervasive influence of gendered stereotypes and the valorisation of masculine norms, which collectively hinder women's entry, retention, and advancement in the sector. Discriminatory practices manifest in both explicit and subtle forms, ranging from routine microaggressions to acute structural exclusions. Overcoming the 'triple glass ceiling' in FinTech remains a formidable challenge, demanding systemic change and sustained commitment to gender equity. Small sample size, a lack of adequate women in the sample and possible response biases are mentioned as the limitations.

Asare Obeng, Gyamfi, Arhinful, and Mensah (2025) used a survey of 392 participants (using snowball sampling) from the public hospitals in Ghana to evaluate the influence of workforce diversity management on employee performance, considering the moderating role of gender diversity in this relationship. Workforce diversity management and gender diversity were positively correlated with employee performance, enhancing collaboration, innovation, and overall productivity, particularly within diverse teams exhibiting an equitable gender distribution. Gender diversity moderated the relationship between workforce diversity management and employee performance. Social categorisation theory was used in this research. The implications for theoretical, managerial, and HR practices and scope for future research were discussed. The limitations include the nature of the sample not allowing generalisation, lack of depth due to the absence of qualitative data, sampling bias and restricted sample diversity due to snowball sampling, focus on gender diversity only and cross-sectional nature of the study.

Nazrul (2024) examined the factors contributing to the underrepresentation of women in executive leadership roles in Norway. Anchored in social role theory and the glass ceiling framework, this study employed a comprehensive literature review encompassing peer-reviewed academic journals, government policy documents, and industry reports. Through thematic analysis, three primary domains emerged as drivers of gender disparity: societal and cultural norms, organisational structures and practices, and individual-level determinants. Key barriers included entrenched gender stereotypes, implicit biases, limited access to mentorship and professional networks, organisational cultures that reinforce gendered expectations, structural impediments, and personal attributes such as confidence, self-perception, and risk tolerance. The findings also highlighted the insufficiency of existing interventions aimed at bridging the gender leadership gap. In response, the author advocated for a multi-level strategy involving coordinated efforts by policymakers, organisations, and individuals to foster more equitable leadership representation. Notable limitations of the study include its reliance on secondary data sources and its exclusive focus on the Norwegian context.

Chan and Hutchings (2025) examined the careers of women with disabilities through the HRM concept. A systematic review of 80 papers identified four key career-related themes about women with disabilities: (1) Educational interventions and support for positive career outcomes of women with disabilities; (2) Workplace discrimination and workplace accessibility of women with disabilities; (3) Factors influencing the career development and advancement of women with disabilities; and (4) The role of gender in the career exploration and decision-making processes of women with disabilities. An agenda for future research and implications for educators, HRM professionals, employers and women with disabilities are discussed.

From a systematic review of 49 papers, Yang, Subramanian, and Al Harthy (2024) noted that social, moral, legal and business arguments for gender diversity (GD) in logistics and supply-chain management (LSCM) have been made since the 1970s. However, women are still underrepresented in LSCM. To attract and retain women in LSCM, the literature has focused on various career-related factors, diversity management practices, and barriers and drivers for female participation in the profession. In addition to addressing internal employee GD in a focal company, the literature also emphasises the need to concentrate on external supplier GD issues, with an ultimate aim of achieving GD across the entire supply chain. Given talent gaps and shortages, the business case for GD has been further strengthened in the literature on gender differences in LSCM. The highly outsourced and globalised nature of supply chains brings further dimensions to the research on GD issues in LSCM, such as the gendered approach to global value chains and how to deal with modern slavery in the contemporary complex supply networks. One limitation of this review is the possibility of missing out important papers due to the inclusion and exclusion criteria used for the selection of papers.

Meharunisa, Almugren, Sarabdeen, Mabrouk, and Kijas (2024) aimed to examine the implications of AI capabilities on work-life balance and the empowerment of female faculty members in enhancing the efficiency of educational institutions. A survey of 180 women faculty from Saudi universities revealed that AI managerial capability, as well as AI infrastructure agility, impacts

work-life balance and empowerment of women faculty in educational institutions' efficiency, underscoring the significance of considering demographic factors when analysing women's empowerment and work-life balance as outcomes. AI managerial capability has a specific effect on the empowerment of women in Saudi universities. The authors provided three recommendations to solve the gender issues in Saudi universities. Limitations include the collection of data from a specific region of Saudi Arabia, the reluctance of participants to respond to certain items due to the fear that their responses may be noticed by their bosses and sampling only from universities.

4. DISCUSSION

Overall, the review shows beneficial effects of integrating technology and gender-specific leadership on decision-making strategies, communication channels, and organisational effectiveness, all leading to more innovative organisations and enhancing employee and organisational performance. However, despite positive measures, gender gaps exist in leadership positions in many countries. The guidelines of international organisations help to integrate technology with gender dimensions. (Zografou, 2023).

One way of addressing the gender gap in decision-making positions is to promote gender diversity. Its usefulness in better financial risk management was demonstrated by Alex-Omiogbemi, Sule, Omowole, and Owoade (2024). The benefits of decreasing gender gaps in leadership positions in STEM fields are innovations, enhanced productivity and talent utilisation (George, 2024). Empowerment of rural women can release them from unproductive work and engage them in economically beneficial work, especially for climate change adaptation and sustainable development (Adhikari & Ghimire, 2025). In countries like Saudi Arabia, it is necessary to develop culturally sensitive training programmes for women in digital skills to empower them for leadership positions (Berezhna, et al., 2025). To remove societal gender bias against women, frameworks like that of Nikghadam-Hojjati, et al. (2025) might be useful. The existence of strong feminism and feminist theories is only partially effective in ensuring gender equity, even in developed countries (Kark & Buengeler, 2024). Many developing countries have gender-responsive policies to promote gender equity in participation in agriculture and socio-economic activities, along with men (Adefila, Ajayi, Toromade, & Sam-Bulya, 2024). The pathetic employment conditions of women in Sub-Saharan regions can be addressed only if the barriers of cultural norms, gender stereotyping, violence against women, lack of resources, institutional gaps and restrictions on health and reproductive rights are removed (Akinwale, 2023).

Integration of technology with gender-specific leadership can open communication channels for better interactions with other stakeholders. This is because women have more positively framed communication with transformational leadership styles (Angelakis, et al., 2024). Unequal participation in group processes renders climate change actions ineffective. Promotion of women's networks and communication channels could be a solution to this (Gumucio, Hansen, Huyer, & Van Huysen, 2020). Communication roles and non-verbal communications of women differ from those of men, while there is no difference between them regarding verbal communications. Cultural and societal norms can influence the social media behaviour of women more than that of men (Zibin, Al-Sabatin, & Altakhaineh, 2025). The OTT platforms are effective in removing gender issues by promoting diverse views. Many films on these platforms deal with gender equity and justice (Uniyal & Mirza, 2024). Unbiased HR managers tend to recruit more women for specific jobs to narrow the gender gap in organisations (Boehncke, 2025). Spreading the discussions on gender-specific medicines beyond medical professionals on social media can enhance their faster adoption (Baum, Baumann, & Batzel, 2024). Occupational challenges and workplace conflicts affect women more than men (Gren, 2025). Interventions like a short training can enhance their digital skills of women to qualify for leadership positions (Ortiz Osejo, Arrechea, & Alvarado, 2025). AI adoption and attitude towards women are mediated by gender, tilting more favourably towards women. These can lead to greater engagement, satisfaction, and positive perceptions of technology (Habes, Alhazmi, Elareshi, & Attar, 2024). Fintech as a tool to narrow gender gaps through digital financial tools was observed by Filipovska, et al. (2024).

Organisational effectiveness can be improved by the integration of technology with gender-specific leadership. According to Valdes, Thomason, Bentancor, Jeria, and Troncoso (2022), both technologies as a culture and technology as a tool can influence organisational dynamics and increase its effectiveness. Although AI has the potential to generate biased data and information, its proper and ethical use can prevent such bias, leading to improved organisational effectiveness through improved decision making, innovation and performance (Newstead, Eager, & Wilson, 2023). Gendered leadership approaches shaped the HR practices of family SMEs, aligning with current gender norms. This pivotal role of female HR managers can improve the organisational outcomes (Flamini, Morelli, Gnan, & Cori, 2024). If NATO can improve the issues related to gender equity among its members, it can lead to a more just and secure global order (Trochowska-Sviderok, Masakowski, McFate, & Holohan, 2024). Women in fintech firms face the challenges of a triple glass-door ceiling due to gendered stereotyping and valorising masculinism, thus blocking the entry, retention and advancement of women in this sector. This can be overcome only by drastic changes in policies and strategies (Fox-Robertson & Wójcik, 2024). Practice of gender diversity management in the workforce

contributes to enhanced collaborations, employee performance and overall productivity (Asare Obeng, Gyamfi, Arhinful, & Mensah, 2025). Many barriers to gender equity exist, which are not completely removed by the current interventions. Multilevel coordinated approaches are required to address them (Nazrul, 2024). Women with disabilities can rise to leadership positions with educational interventions, reduction of workplace discrimination and biases against them in career advancement and involving them in decision-making processes (Chan & Hutchings, 2025). To ensure gender diversity in logistics and supply chains, social, moral, legal and business aspects need to be considered. The aim should be to implement gender diversity in the entire supply chain (Yang, Subramanian, & Al Harthy, 2024). Women in university faculties can be empowered by developing their AI managerial and infrastructure capabilities, leading to a better work-life balance (Meharunisa, Almugren, Sarabdeen, Mabrouk, & Kijas, 2024).

All the above highlights apply to Saudi Arabia, where strong cultural and social norms prevent women's education and entry into leadership jobs, despite some recent reforms favouring their participation in the nation's economic growth. Currently, women occupy over 30% of leadership positions in some Saudi Arabian organisations despite these problems.

4.1 ome numerical trends

Type of paper
The 30 papers reviewed fell into five categories, as shown in Figure 2.

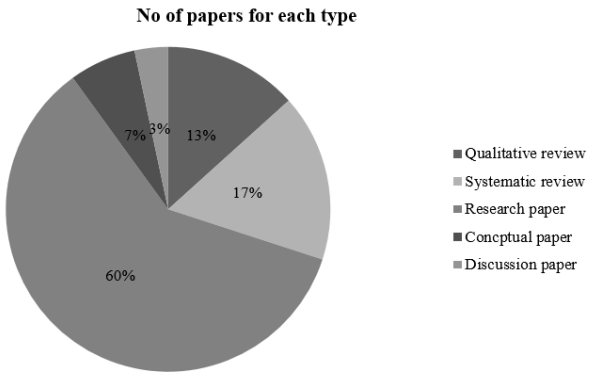


Figure 2. Types of papers

Research papers (18, 60%) were the maximum. There were five (17%) systematic reviews, four (13%) qualitative reviews, two conceptual papers and one discussion paper. These numbers may not reflect the general trend, as the trend is based on 30 papers selected based on certain inclusion and exclusion criteria.

Research methods
Out of the 18 research papers, five used surveys, one used interviews, three used case studies, four used mixed approaches and four used other methods, as shown in Figure 3.

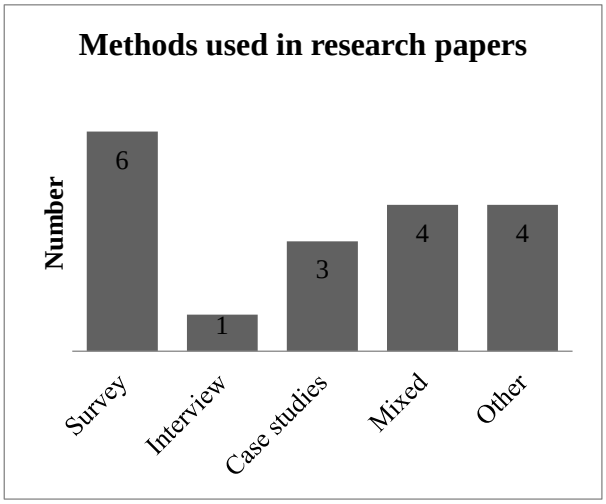


Figure 3. Methods used in the research papers

Mentioning limitations
Of the 30 reviewed papers, 15 did not mention any limitations of their studies. The remaining 15 mentioned different types of limitations. Small sample size was often a limitation in the research papers.

Giving recommendations
Out of 30 reviewed papers, eight did not give any recommendations. The recommendations given by the others ranged from future research to practical strategies.

Quality of papers
The overall quality of the 30 reviewed papers was judged on a five-point scale covering aim, methodology, findings, recommendations and limitations, as was explained in the Method section. The quality of papers according to their types is presented in Table 2.

If we consider 0 to 3 as poor quality, 3.1 to 4 as medium quality and above four as high quality, only research papers were of high quality with a mean score of 4.4. All others, except the discussion paper, were of medium quality. The discussion paper was of poor quality.

Table 2. Quality of papers according to their types

Paper type	Number	Mean quality score
Qualitative review	4	3.50
Systematic review	5	3.00
Research paper	18	4.40
Conceptual paper	2	3.75
Discussion paper	1	3.00

4. CONCLUSIONS

Ensuring gender diversity and placing women with high digital capabilities in leadership positions can improve their work engagement, satisfaction, career development and work-life balance. Their leadership will enhance innovation, employee engagement, and satisfaction, leading to highly interactive communication channels and collaborative working, ultimately benefiting organisational effectiveness and performance. However, there are many barriers to be addressed for implementing gender diversity and giving leadership roles to female employees. Research has given some solutions to some of these problems. However, in most countries, gender gaps do exist, and the percentage of women in leadership positions is increasing only slowly. With its strong Islamic culture and social norms, the situation in Saudi Arabia is not very different from the situation in other countries.

Limitations of this review

This review has many limitations. Depending on a single search engine (Google Scholar), rather than databases, targeting 30 papers and setting the period of publication as 2020 to 2025, might have missed many important papers. Meta-analysis could not be done due to the different ways of reporting results in empirical studies.

Recommendations for research

Research comparing countries of different cultures and social norms and using mixed methods is inadequate. Future research should consider these areas. Empirical studies to compare organisations with and without women in leadership positions need to be done to provide direct evidence. Some meta-analytical reviews will provide an assessment of the status of information on this topic. Some pilot-scale field trials using recommendations from research need to be undertaken.

Recommendations for practice

Various organisations working on gender diversity and women's rights need to come together, evaluate the current knowledge and derive the best practices for gender diversity and placing women in leadership positions. National governments should have firm policies and strategies for the inclusivity of women in higher education, training in digital capabilities and management. Countries should enact laws to stipulate the percentage of women leaders in an organisation. Heavy punishment for violations is necessary.

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