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Challenges in implementing digital employment platforms for women's participation in Sri Lanka: A structural equation modeling approach

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ABSTRACT

The female labor force participation (FLFP) rate is vital for socioeconomic growth, influencing productivity, economic progress, and gender equality. Despite advancements in women's digital and computer skills, Sri Lanka's FLFP remains low, averaging 34% over the past decade. The increasing digital skills among women present an opportunity to address this issue through digital employment platforms that offer flexible work arrangements and remote job opportunities, especially for women balancing work and family responsibilities. This study employs Structural Equation Modeling (SEM) to quantitatively assess the challenges faced by women in using digital employment platforms within Sri Lanka's banking and manufacturing sectors, which, despite their potential for digital transformation, exhibit low digital maturity. Findings reveal that inadequate technical skills, limited empowerment, weak communication, low confidence in digital technologies, and societal and institutional barriers are major obstacles. Additionally, poor professional networking, low interest in ICT skills, and insufficient risk assessment further hinder women's engagement with digital platforms. These barriers underscore the urgent need for targeted interventions to enhance technical training, empower women professionally, improve networking opportunities, and strengthen risk management, thereby promoting gender equality and inclusive employment within Sri Lanka's labor market.

1. Introduction

Sri Lanka is experiencing a severe economic downturn, leading to widespread job losses as companies struggle financially. The lack of economic resilience among businesses has exacerbated unemployment, creating an urgent need for innovative solutions to support individuals and the national economy (Jayasinghe et al., 2022). Implementing digital platforms, such as freelancing websites like Upwork or remote work platforms like Fiverr, presents a promising solution to this crisis (Hackl and Najdi, 2024). These platforms can alleviate economic pressures by providing alternative employment opportunities, allowing individuals to earn income even when traditional job markets decline. Additionally, they offer companies a way to sustain operations without the overhead costs associated with physical offices, thereby contributing to overall economic sustainability (Hadizadeh et al., 2024).

The current world of work can be observed with the rapid transformation of digital technologies, which means digitalization has permeated almost all major economic sectors (Massa et al., 2023). From software developers and programmers to domestic workers on digital labor platforms to market vendors and micro entrepreneurs who use digital tools to reach customers, digital labor encompasses a wide range of occupations. The COVID-19 pandemic has accelerated digitalization as work and livelihoods have shifted online. The Central Bank of Sri Lanka claimed that the Government and other key stakeholder institutions continued to enhance the digital infrastructure base to facilitate the envisaged digital transformation of the economy in 2022. In an analysis of about 50 Sri Lankan companies across multiple industries, the country's Digital Quality (DQ) is at 35 places, higher than the global median of 33 (De Bustis et al., 2018). The same analysis found that, compared with other Asia

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Pacific emerging markets, Sri Lanka exhibits strengths in connectivity, digital marketing, investment in digital initiatives, and the ability to move quickly. However, compared with China, India, and more developed countries, Sri Lanka's position is unsatisfactory, as Sri Lanka's digital labor platform is not maintained continuously for numerous reasons. Consequently, some companies have partially or entirely transitioned from digital platforms to physical work environments after the COVID period.

Despite the potential of digital platforms, there remains a significant gender disparity in their utilization. In Sri Lanka, female participation in the labor market has gradually declined from 2019 to 2021, with only 31.8% of females being part of the labor force in 2021. While male participation in digital employment is steadily increasing, with men dominating around 75% of digital platforms, women remain significantly underrepresented, accounting for only 25% of participants on these platforms (ILO, 2020). The female labor force participation (FLFP) rate is crucial to a nation's socioeconomic development. Having greater FLFP and policies supporting their advancement is a well-studied economic and social imperative: it boosts productivity and economic growth, reduces income inequality, and supports economic resilience (IMF, 2018). Women's economic participation is also connected to favorable outcomes, such as improved nutrition, educational attainment, and greater participation in household decision-making (Andlib et al., 2022). Moreover, the Organization for Economic Co-operation and Development (OECD, 2017) suggested that digital transformation will sustain women's positions in the labor market. Flexible work arrangements may facilitate balancing paid work and caregiving responsibilities, which women often assume. Additionally, automation will likely replace less skilled jobs, potentially benefiting women, as they generally surpass men in educational attainment.

The gender disparity is particularly concerning given the rising rates of women pursuing education in STEM (Science, Technology, Engineering, and Mathematics) and IT fields. For instance, the percentage of women enrolled in STEM programs in Sri Lanka has increased by approximately 20% over the last five years, indicating a growing pool of qualified female candidates for digital roles. However, despite these educational advancements, many companies in Sri Lanka are still reluctant to recruit women for digital roles. This reluctance often stems from outdated perceptions of women's capabilities in the digital sphere and concerns about productivity or cultural biases. These managerial concerns contribute to the broader issue of female underrepresentation in the digital labour force, further perpetuating gender inequality in the workplace. Understanding why managers may be hesitant, whether due to concerns about productivity, operational challenges, or cultural biases, is crucial for developing strategies encouraging companies to offer women digital opportunities. Addressing these barriers from a managerial perspective will be key to creating a more inclusive digital workforce, which can drive economic growth and gender equity in Sri Lanka.

The 2030 Agenda for Sustainable Development emphasizes the significance of gender equality and its role in achieving the Sustainable Development Goals (SDGs). To effectively meet the SDG agenda, it is crucial to prioritize creating more and higher-quality jobs for women, establishing universal social protection, and addressing unpaid care and household work. These efforts contribute to poverty reduction (Goal 1), the reduction of inequalities (Goal 10), gender equality (Goal 5), and the promotion of inclusive and sustainable employment (Goal 8). The ILO strongly advocates for gender equality in the workplace, as it benefits businesses and society. Gender equality enhances enterprise productivity, stimulates economic growth, and improves family welfare. The ILO's fundamental conventions on gender equality serve as the foundation for promoting gender equality in employment (ILO, 2021). Therefore, identifying challenges to implementing a digitalized labour force platform for women in Sri Lanka is vital for policymakers and government officials to support sustainable pathways toward achieving these SDGs.

2. Literature review

Digital platforms have created opportunities and challenges, particularly for women. While digitalization promises increased flexibility and access to economic opportunities, it also exacerbates existing gender disparities. The OECD (2017) emphasized that women face unique challenges with the advent of new digital technologies, often rooted in broader societal inequalities. For instance, women carry a disproportionate share of caregiving and household responsibilities, resulting in a "double burden" that limits their ability to engage with digital platforms effectively.

Existing literature points to several barriers women face when participating in digital labor platforms. Gillwald and Partridge (2022) mentioned that women generally perform worse than men in tasks requiring digital technologies, attributing this disparity to poorer navigation skills and diminished interest in ICT-related activities. Differences in cognitive abilities compound this gender gap; Ramírez-Uclés and Ramírez-Uclés (2020) documented significant gaps in reading proficiency and visual-spatial skills, which are critical for success in technology-driven environments. Jian and Abu Bakar (2024) corroborated these findings, indicating that cognitive skill disparities continue to hinder women's performance in digital tasks. These insights highlight the importance of addressing specific cognitive skill gaps, such as visual-spatial abilities and abstract information processing, essential for effective participation in digital platforms. Moreover, the OECD (2018) reported that older working

women are more likely to lack the foundational skills necessary for adapting to digital transformation, and they face significant barriers in accessing education and training due to family responsibilities. This challenge is reflected in the Joint Monitoring Program (JMP) findings, which note that a higher percentage of women drop out of online platforms within a year than men. This trend is supported by Ke et al. (2024), who found that continuous engagement on digital platforms is significantly lower among women, particularly those balancing multiple caregiving roles. Such findings underscore the critical need to enhance women's technical abilities and problem-solving skills to sustain their engagement in digital employment.

Further complicating women's participation in digital platforms is the lack of networking opportunities and professional support, as noted by the International Professional Association focused on IT Governance. Maternity and maternal-related leave also pose significant barriers, leading to potential discrimination and exclusion from digital labor platforms. These issues are compounded by low confidence, burdensome tasks, and a lack of empowerment (Anwar, 2022; Gunatilaka and Chandrasiri, 2022). These factors collectively illustrate the necessity of fostering a supportive professional network and enhancing empowerment and communication channels to mitigate women's challenges in digital employment environments.

Beyond these individual barriers, structural and organizational challenges also hinder the maintenance and growth of digital labor platforms. Garcias and Noury (2021) pointed out that measuring the performance of these platforms is inherently difficult, while Oluka (2024) identified a lack of skilled resources and technology adoption as critical barriers. Jiang et al. (2023) expand on this by discussing the influence of technical, individual, organizational, and environmental barriers on digital platform maintenance. Hassan et al. (2024) further underscored the importance of external support, noting that insufficient resources, limited expertise, and a lack of stakeholder interest significantly impede digital transformation efforts. These structural insights justify the inclusion of variables such as the failure to carry out risk assessments, which reflect organizational shortcomings that can disproportionately affect women already facing multiple barriers.

Despite the extensive body of literature addressing the barriers women face in digital platforms, there remains a notable gap in research that contextualizes these challenges within specific cultural and geographic settings. With its unique socio-cultural dynamics and rapidly evolving digital landscape, Sri Lanka serves as an essential case study for exploring these issues. Current studies often overlook the interplay between cultural norms and digital engagement, particularly in developing regions. For instance, while global research highlights general barriers, the specific impact of Sri Lankan cultural expectations on women's digital participation remains underexplored. Additionally, there is limited understanding of how localized organizational practices and technological infrastructure in Sri Lanka interact with the identified gender-specific barriers.

This study aims to bridge these gaps by examining the barriers to digital platform use among women in Sri Lanka. The synthesized literature directly informs the selected variables, ranging from technical abilities and cognitive skills to empowerment, networking, and organizational support. By focusing on factors such as limited time due to caregiving, cognitive skill gaps, lack of professional networks, and organizational deficiencies, the study seeks to provide a comprehensive analysis tailored to the Sri Lankan context. This approach aligns with the extant literature and extends it by incorporating the socio-cultural and structural elements specific to Sri Lanka. Understanding these barriers within the Sri Lankan setting will offer valuable insights that could be extrapolated to similar contexts in other developing regions, thereby contributing to the broader discourse on gender and digitalization.

3. Data and methodology

3.1. Study area

The research focuses on two key sectors: banking and manufacturing. These two industries have a lower level of digitalization but have the potential to provide digital tools to their workforce, making it relevant to the study's objective. This observation holds globally and within the context of Sri Lanka. The manufacturing and banking sectors in Sri Lanka are positioned below the national median level of digital maturity (De Bustis et al., 2018). De Bustis et al. (2018) claimed that Sri Lanka had surpassed the global digital maturity level, suggesting a favorable environment for enhancing the labor market through digitalization. This presents a significant opportunity to transform the women's labor force in Sri Lanka, leading to improved economic status and gender equity.

3.2. Data collection

The target population for this study includes managers across three levels of management: Top management, middle-level management, and operational-level management. These managers are strategically positioned within their organizations to provide valuable insights into the issues affecting female participation in digital platforms. While the direct experiences of women who face barriers to digital platform engagement are undoubtedly important, this study adopts a managerial perspective for several reasons. Managers hold decision-making power within organizations, making them the gatekeepers of digital platform implementation. Their perspectives are crucial for

understanding the organizational and strategic challenges that may impede the inclusion of women in digital work (Cortellazzo et al., 2019).

Moreover, managers can offer a comprehensive view of the systemic issues within their organizations, such as cultural biases, resource limitations, and operational challenges. These insights are essential for identifying the root causes of gender disparity in digital platform utilization (Llorens et al., 2021). By capturing managers' views, the study aims to identify specific areas where interventions can be implemented to promote more inclusive practices. Understanding the managerial perspective will also help develop targeted strategies addressing the managers' concerns and women's barriers (Cortellazzo et al., 2019).

Data for this study was collected through an online questionnaire distributed to managers in selected companies and banks. The questionnaire was carefully designed to elicit detailed responses about the challenges and barriers managers perceive in implementing digital labor platforms for women. It included questions related to perceived gender biases, organizational culture, resource constraints, and the impact of existing policies on female participation in digital work. By gathering this information, the study seeks to provide a comprehensive understanding of the organizational-level barriers contributing to women's underrepresentation in digital platforms.

3.3. Sample size and sampling procedure

The study employed a stratified sampling procedure to select participants from the combined population of top, middle, and operational-level managers in the manufacturing and banking sectors. The sample size was determined using the Yamane method. Table 1 shows the sample composition of the study.

Table 1: Sample composition

Variable		Frequency	%
Managerial level	Top level	28	23.0
	Middle level	35	28.7
	Operational level	59	48.4

3.4. Data analysis technique

This study utilizes Structural Equation Modeling (SEM) to examine the challenges of implementing digitalized labor platforms for women in Sri Lanka's banking and manufacturing sectors. SEM is selected for its robust ability to analyze complex relationships between multiple variables simultaneously (Hair et al., 2021), essential for understanding the multifaceted barriers affecting women's participation in digital employment platforms. This approach allows for assessing both direct and indirect effects, providing a comprehensive view of the underlying factors that influence the effectiveness of digital labor platforms. SEM is further justified by its capacity to account for measurement errors and to model latent constructs derived from multiple indicators (Hair et al., 2021). This ensures a more accurate representation of the studied constructs than traditional regression methods. By employing SEM, the study can effectively capture the interplay between individual and structural factors, offering more profound insights into how these elements collectively impact managers' perceptions of digital labour platforms for women.

Data reliability is established with a Cronbach's Alpha value of 0.83, indicating high internal consistency across the measurement instruments (Taber, 2018). Confirmatory Factor Analysis (CFA) is conducted to ensure the validity of the measurement model. CFA verifies that the indicators accurately represent their respective latent constructs, with factor loadings exceeding the recommended threshold of 0.70 (Baharum et al., 2023). Additionally, fit indices such as the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) are evaluated to confirm the adequacy of the model fit, ensuring that the proposed model reliably reflects the underlying data structure (Xia and Yang, 2019).

The SEM analysis has two main stages. Initially, the measurement model is validated to confirm the reliability and validity of the constructs. Subsequently, the structural model is tested to explore the hypothesized relationships between the independent and dependent variables. Path coefficients are estimated to determine the strength and significance of these relationships, allowing for the identification of both direct and indirect effects (Hair et al., 2021). This methodological rigour facilitates a nuanced understanding of how various factors shape managers' perceptions of digital labour platforms for women.

By integrating SEM into the analytical framework, the study provides a thorough and reliable analysis of the barriers impeding women's participation in digital employment platforms within Sri Lanka's specific cultural and geographic context. This approach aligns with the study's objectives and contributes valuable insights to the broader discourse on gender and digitalization in developing regions.

4. Data analysis and discussion

4.1. Female labor force participation in Sri Lanka

Sri Lanka has historically faced challenges in achieving high levels of FLFP despite significant progress in education and healthcare for women. Cultural norms, traditional gender roles, and structural barriers have often limited women's participation in the labor market (ILO, 2016). Despite these challenges, there have been periods of improvement due to government initiatives, economic reforms, and efforts by various organizations to empower women and promote gender equality in the workplace. The FLFP rate has shown variability in the past decade, reflecting the

complex interplay of socioeconomic factors, policy changes, and external influences such as economic downturns and the COVID-19 pandemic (ILO, 2022).

Fig. 1 illustrates the trend of FLFP in Sri Lanka from 2014 to 2023.

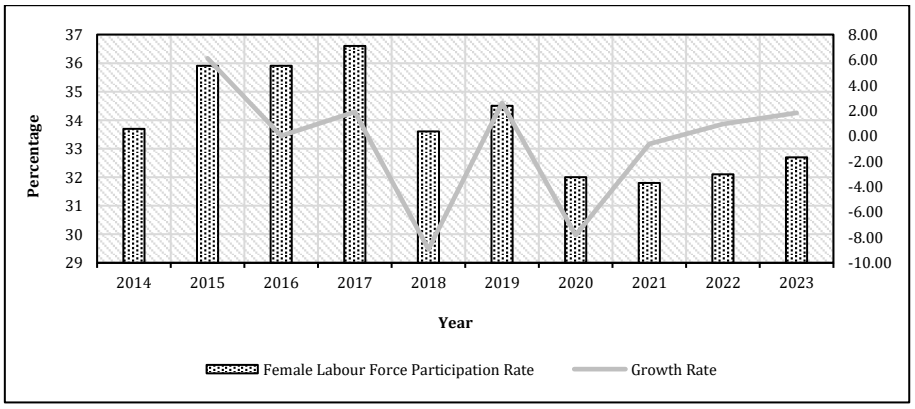

Fig. 1: Female Labor force participation in Sri Lanka (2014–2023)

According to Fig. 1, the FLFP was approximately 33.5% in 2014, which increased to around 36% in 2015, marking significant growth. However, the growth rate started to decline sharply in 2016, even though the FLFP remained relatively stable, indicating that the increase in participation was slowing down. By 2017, the FLFP peaked at about 36.5%, but the growth rate showed a negative trend, suggesting a plateauing effect on women's participation.

A notable decline occurred in 2018, where the FLFP dropped to around 31%, accompanied by a steep negative growth rate. This downward trend in participation was alarming, reflecting potential socioeconomic or policy-related issues impacting women's engagement in the labour market. Despite a slight recovery in the FLFP in 2019, the growth rate remained volatile, indicating fluctuations in female labour market dynamics.

The FLFP stabilized around 32% to 33% from 2020 to 2022, with the growth rate showing some recovery but still indicating moderate participation increases. By 2023, the FLFP had risen to approximately 34%, with a positive growth rate reflecting a gradual improvement in female labor force engagement.

Fig. 1 reveals significant variability in the FLFP over the years, with periods of growth and decline. The fluctuations in the growth rate highlight the challenges and changing dynamics in the labor market for women in Sri Lanka. This variability underscores the need for targeted policies and interventions to sustain and enhance FLFP, ensuring that women can contribute effectively to the country's economic growth and development.

Fig. 2 illustrates a rising trend in computer and digital literacy rates among females in Sri Lanka from 2014 to 2023. The computer literacy rate steadily increased, from around 25% in 2014 to about 35% by 2023. The digital literacy rate exhibits a more pronounced growth, starting at approximately 20% in 2014 and surging to about 60% by 2023. This significant increase in digital literacy reflects a broader global trend towards digitalization and increased access to technology. Despite these promising trends, increased digital and computer literacy benefits among women have not been fully realized in enhancing FLFP in Sri Lanka.

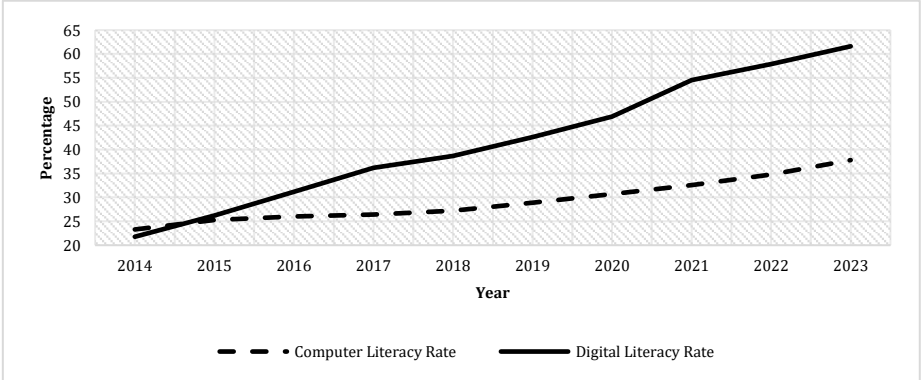

Fig. 2: Computer literacy and digital literacy rate of females in Sri Lanka (2014–2023)

Sri Lanka has historically faced challenges in achieving high levels of FLFP despite significant progress in education and healthcare for women. Cultural norms and traditional gender roles often discourage women from pursuing employment, particularly in sectors requiring technological proficiency (Kraugusteeliana, 2023). Given these barriers, implementing digital platforms is an

optimal solution to enhance FLFP (ILO, 2016). Digital platforms can offer flexible work arrangements, remote job opportunities, and access to global markets, which can help women balance work and family responsibilities more effectively (ILO, 2016). This approach leverages the rising digital and computer literacy rates among women, allowing them to utilize their skills in meaningful employment. Even with the increasing number of women entering STEM education, women represent less than 35% of the labor force in Sri Lanka. This underrepresentation indicates that the potential of digitally skilled women is not fully utilized in the labor market. The gap between rising digital literacy and actual labor force participation suggests underlying issues preventing women from effectively leveraging their digital skills in employment. While government initiatives and economic reforms have occasionally boosted FLFP, their impact has been inconsistent. Despite policies promoting gender equality in the workplace and efforts by various organizations to empower women, there remains a gap between women's educational achievements and their participation in the workforce. This gap underscores the importance of identifying challenges within companies that may prevent the effective implementation of digital platforms for women. Understanding and addressing these challenges is crucial to harnessing the potential of increasing digital proficiency among women. It is not enough to improve digital literacy rates; it is also essential to create an enabling environment where these skills can be applied meaningfully in the workforce.

Thus, while the graph highlights a positive digital and computer literacy trend among females in Sri Lanka, these advancements have not yet translated into significant improvements in FLFP. Addressing this issue requires a focused effort to identify and overcome the barriers within companies that prevent the effective utilization of women's digital skills. By bridging this gap, Sri Lanka can better support women's active participation in the labor market and drive sustainable economic development.

4.2. Identify the challenges of implementing a digital platform for women

4.2.1. Structural model

The dependent variable is the challenges of implementing a digital labor platform for women (4 items), and the independent variables are Empowerment Deficiencies (4 items), Lack of Cognitive Performance (3 items), Digital Proficiency Disparities (3 items), and Work-Life Constraints (3 items). These items were tested for convergent validity, reliability, and discriminant validity. Cheung et al. (2024) suggested that the test for convergent validity of the items associated with any latent variables should have a loading factor equal to or higher than the cutoff value of 0.50. Table 2 indicates that the measurements for convergent validity are confirmed as each item has a value higher than 0.50. Composite Reliability (CR) and Average Variance Extracted (AVE) assess the reliability of the items. The reliability test is also supported as CR for each item exceeded the suggested cutoff value of 0.6, and all AVEs were above the suggested value of 0.5 (Cheung et al., 2024).

Table 2: Convergent validity test

Construct	No. of items	Standardized factor loadings		AVE	CR
		Min	Max		
Empowerment deficiencies	4/4	.664	.798	0.502	0.750
Lack of cognitive performance	3/3	.642	.793	0.548	0.829
Digital proficiency disparities	3/3	.687	.741	0.550	0.784
Work-life constraints	3/3	.656	.793	0.504	0.753
Implementing a digital labor platform	3/3	.685	.805	0.568	0.797

4.2.2. Goodness of fit of measurement model

Table 3 shows that all the Absolute Fit Indices, Incremental Fit Indices, and Parsimony Fit Indices satisfied the threshold suggested. Thus, results show no decline in the fit indexes of the constrained model, indicating satisfactory evidence for metric invariance (Hair et al., 2021).

4.2.3. Discriminant validity test

The discriminant validity test ensures that the square root of the AVE for each variable is greater than the inter-construct correlations. As indicated in Table 4, the AVE value of each construct is higher than the squared correlations between that construct and other constructs, suggesting the existence of discriminant validity between the underlying constructs (Hair et al., 2021).

4.2.4. Results of the path analysis

Path analysis is a type of general linear model comparable to multiple regression in that it allows the measurement of the effect of several independent variables on a dependent variable (Du et al., 2021). Table 5 illustrates the results of the path analysis.

5. Results and discussion

The findings of this study highlight the profound impact of empowerment deficiencies and digital proficiency disparities on the implementation of digital labor platforms for women in Sri Lanka's

banking and manufacturing sectors. Empowerment deficiencies, characterized by poor technical abilities, lack of empowerment and communication, and low confidence and self-esteem, create substantial barriers that hinder women's effective engagement with digital platforms. These deficiencies limit women's professional growth and participation in the digital economy and reduce their overall contribution to organizational efficiency and productivity. The absence of adequate training and resources exacerbates these challenges, leaving women disadvantaged in career advancement and limiting their ability to utilize digital labor initiatives fully.

Table 3: Goodness of fit of the measurement model

The goodness of fit index		Observed value	Threshold
Absolute fit indices	CMIN/DF	1.317	< 3
	GFI	.893	Close to 1
	AGFI	.845	Close to 1
	RMR	.086	< 0.1
	RMSEA	.051	< 0.1
Incremental fit indices	TLI	.936	Close to 1
	CFI	.950	Close to 1
	RFI	.779	Close to 1
	NFI	.827	Close to 1
Parsimony fit indices	PGFI	.617	Close to 1
	PRATIO	.783	Close to 1
	PNFI	.648	Close to 1
	PCFI	.744	Close to 1

Table 4: Comparison of squared inter-construct correlations with AVE

	WLC	ED	LCP	DP	IDLP
WLC	0.708				
ED	0.237	0.741			
LCP	0.250	0.440	0.742		
DP	0.119	0.184	0.131	0.710	
IDLP	-0.008	-0.060	0.040	0.253	0.754

Table 5: Results of path analysis

Loadings	Items	Variable	
0.77	Lack of technical abilities that are required for the specific tasks	Empowerment deficiencies	
0.73	Burdensome tasks	Path coefficient	0.829 (0.140)
0.79	Lack of empowerment and communication	Critical Ratio	8.37
0.68	Low confidence and self-esteem	Decision	Supportive
0.74	Women tend to do worse on tests that require a greater visual-spatial ability	Lack of cognitive performance	
		Path coefficient	.051 (.119)
0.83	Women tend to do worse on tasks that require a greater amount of abstract information processing	Critical Ratio	0.429
0.65	Women tend to do worse in generating and manipulating information in a mental representation	Decision	Not supportive
0.76	Lack of a strong professional network	Digital proficiency disparities	
		Path coefficient	.216 (.092)
0.67	Women are less interested in ICT-related skills	Critical Ratio	2.348
0.70	Failure to carry out a risk assessment	Decision	Supportive
0.65	Women do not have much time for work as they disproportionately take on care and household responsibilities	Work-life constraints	
		Path coefficient	-.009 (.116)
0.82	Women perform less well than men in problem-solving tasks on digital technologies	Critical Ratio	-0.078
0.64	Mishandling requests for flexible working upon returning from maternity leave	Decision	Not supportive

Furthermore, the broader lack of empowerment and effective organizational communication intensifies these issues. Societal and institutional barriers prevent women from asserting themselves in professional settings, resulting in diminished participation in decision-making processes and restricted access to opportunities for professional development. Low confidence and self-esteem compound this, deterring women from fully embracing digital platforms, leading to their underrepresentation in digital initiatives and slowing the pace of digital transformation within these sectors.

Digital proficiency disparities present additional challenges, including a lack of robust professional networks, diminished interest in ICT-related skills, and inadequate risk assessments. The lack of professional networks restricts women's access to mentorship and career opportunities, which are essential for navigating and thriving in digital labor environments. Societal norms and insufficient encouragement discourage women from pursuing ICT-related careers, resulting in a limited pool of women with the necessary skills to engage effectively with digital platforms. Moreover, the failure to conduct thorough risk assessments undermines the sustainability and effectiveness of digital platform implementations, making it challenging to address and mitigate barriers proactively.

These persistent issues underscore the need for comprehensive strategies to enhance women's participation in digital labor platforms. Practical recommendations for policymakers and practitioners should target training programs aimed at improving digital literacy and technical skills

among women are essential. These programs should focus on skill development and building confidence and self-esteem, enabling women to navigate digital platforms more effectively. Providing accessible and tailored training can help bridge the technical skill gaps and empower women to engage more confidently with digital labor initiatives.

Moreover, fostering supportive professional networks and mentorship opportunities is critical. Policymakers should promote the establishment of networks that connect women with mentors and peers, facilitating knowledge exchange and career advancement. Creating environments that support professional growth and collaboration can enhance women's engagement and retention on digital platforms. Additionally, implementing comprehensive risk assessment frameworks is necessary to identify and address potential barriers to digital platform adoption. By proactively managing risks, organizations can ensure the sustainability and effectiveness of digital labor platforms, making them more accessible and supportive for women.

Addressing broader empowerment issues requires a holistic approach that promotes gender equality in the workplace and challenges societal norms that limit women's professional participation. Policies that support work-life balance, such as flexible working arrangements and parental leave, can alleviate the double burden of caregiving and professional responsibilities, enabling women to engage more fully with digital platforms. Encouraging gender diversity and inclusion within organizations can create more empowering environments for women, fostering their active participation in the digital economy.

Moreover, aligning these initiatives with national and international development goals, such as the Sustainable Development Goals (SDGs), can amplify their impact. Increasing FLFP is vital not only for economic growth but also for achieving broader developmental objectives. Supported by these policy measures, virtual employment platforms can attract more women to the local labor market, contributing to the nation's economic advancement and sustainable development.

6. Conclusions

Empowerment deficiencies and digital proficiency disparities remain significant challenges to effectively implementing digital labor platforms for women in Sri Lanka. Issues such as inadequate technical skills for specific tasks, lack of empowerment, poor communication, and low self-esteem in digital platforms are prevalent. Additionally, women face difficulties related to limited professional networks, reduced interest in ICT skills, and insufficient risk assessments for digital platform adoption. These challenges contribute to the continued underrepresentation of women in the workforce despite advancements in digital literacy.

List of abbreviations

FLFP	Female labor force participation
SEM	Structural equation modeling
ICT	Information and communication technology
STEM	Science, technology, engineering, and mathematics
SDGs	Sustainable development goals
ILO	International labor organization
OECD	Organization for economic co-operation and development
CFA	Confirmatory factor analysis
CR	Composite reliability
AVE	Average variance extracted
CFI	Comparative fit index
TLI	Tucker-Lewis index
RMSEA	Root mean square error of approximation
GFI	Goodness of fit index
AGFI	Adjusted goodness of fit index
RMR	Root mean square residual
RFI	Relative fit index
NFI	Normed fit index
PGFI	Parsimony goodness-of-fit index
PRATIO	Parsimony ratio
PNFI	Parsimonious normed fit index
PCFI	Parsimonious comparative fit index
WLC	Work-life constraints
ED	Empowerment deficiencies
LCP	Lack of cognitive performance
DP	Digital proficiency disparities
IDLP	Implementing digital labor platform
DQ	Digital quality
JMP	Joint monitoring program
CMIN/DF	Chi-square minimum discrepancy divided by degrees of freedom

Compliance with ethical standards

Ethical considerations

Informed consent was obtained from all participants, and their responses were kept anonymous and confidential. The study adhered to standard ethical guidelines for research involving human subjects.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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