

DIGITALIZATION AND SOCIAL PROTECTION IN PAKISTAN:
ADDRESSING DIGITAL WELFARE EXCLUSION AND EMERGING
CHALLENGES FOR SOCIAL WORK PRACTICE

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Abstract

Digitalization is transforming social protection delivery in Pakistan through digital registration, biometric verification, social registries, data-driven targeting, and electronic payment mechanisms. While these innovations have the potential to improve efficiency, transparency, accessibility, and accountability, they may also generate new forms of welfare exclusion among populations with limited digital literacy, inadequate documentation, poor connectivity, restricted access to technology, and difficulties navigating increasingly technology-dependent welfare systems. This study examines the relationship between digitalization and social protection in Pakistan, with particular attention to digital welfare exclusion and its implications for professional social work practice. It explores how socioeconomic status, gender, age, disability, geographic remoteness, digital literacy, documentation barriers, and access to digital infrastructure influence vulnerable households' ability to register for, access, and continuously receive social protection benefits. The study adopts a mixed-methods design, combining a survey of social protection beneficiaries and potentially excluded households with semi-structured interviews involving social welfare professionals, programme officials, community workers, and representatives of relevant social protection institutions. The research further examines the emerging role of social workers as facilitators between vulnerable citizens and digital welfare systems through outreach, case management, digital assistance, referral, grievance support, and identification of households at risk of exclusion. The study argues that successful digital transformation of social protection should be assessed not only through administrative efficiency and technological modernization but also through its capacity to ensure equitable and inclusive access for socially and digitally marginalized populations. It proposes a human-centred digital social protection framework in which technological innovation is complemented by professional social work interventions and community-based support. The study seeks to contribute to social work and social protection scholarship by positioning digital welfare exclusion as an emerging field of professional practice in Pakistan and by providing policy recommendations for building an inclusive, accessible, and responsive digital welfare system.

INTRODUCTION

1.1 Background and Context

Social protection is now a key element of Pakistan's poverty, socioeconomic inequality, joblessness, food insecurity, climate change shocks, and household vulnerability response. The country has steadily developed its social protection systems with cash transfer, nutrition interventions, social insurance and other targeted assistance programmes among others. The Benazir Income Support Programme (BISP) is a large institutional tool of identification and support to vulnerable households along with social protection programmes at the provincial level. Over the past few years, however, the delivery of social protection has seen a huge shift. Digital technologies are now woven into the entire welfare delivery chain as they are used for beneficiary identification, registration, eligibility assessment, biometric authentication, information management, payment delivery, monitoring, and grievances. This transition is part of a wider trend in the international community towards a "digital social protection system" that is based on digital identification, social registries, management information systems, interoperable databases, and government-to-person payments, which can help enhance efficiency, transparency, responsiveness, and financial inclusion (World Bank, 2025a).

Pakistan has made significant strides in development of this digital social protection infrastructure. Whereas the National Socio-Economic Registry (NSER) has gone from periodic household surveys to a more dynamic registration system, with Dynamic Registration Centres for household registration and update of socio-economic information. Technological underpinnings of targeted welfare delivery have been bolstered due to the growing linkages between BISP systems and the National Database and Registration Authority (NADRA), biometric identification, banking networks, and digital platforms (World Bank, 2025b). The growing integration of information systems in Pakistan's social protection architecture (BISP, 2026a) is also reflected in the use of digital platforms for the registration, verification, compliance monitoring

and payments of beneficiaries under programmes like Benazir Nashonuma.

Reforms in payment mechanisms have further spurred the digital transformation. To attain more direct, transparent and digitally enabled transfers to beneficiary women, BISP launched the Social Protection Wallet initiative. The initiative encompasses digital wallets, individual financial access, SIM-based mechanisms, and interoperable payment systems to empower beneficiaries to have a higher level of control over how they receive social assistance (BISP, 2025a). BISP has also carried out digital and financial literacy interventions and partnerships, and enhanced the capacities of beneficiaries to use emerging payment systems (BISP, 2025b). Overall, these advancements highlight the shift in the understanding of digitalization in Pakistan, moving beyond a mere administrative reform to a key component of the social protection system organization and delivery.

However, social inclusion is not automatically included in the technological modernization. Where welfare systems are relying more heavily on digital identification, biometric verification, mobile phone connectivity, electronic payment methods and household information systems that are digitally maintained, this can also introduce new barriers to accessing welfare for people who may lack the resources or capacities to work with them. Ongoing concerns about exclusion of poor households persist despite positive developments in dynamic registration and registry coverage in Pakistan (World Bank, 2025b). These risks are especially significant in a country that has high inequalities in income, education, gender relations, digital literacy, documentation, disability and geographic access to services.

As such, the shift towards digital social protection in Pakistan should not simply be viewed as technological modernization but as a change in the nature of relationships between vulnerable citizens and welfare institutions. Digitalization can lower the administrative costs, leakages and transaction barriers, but it can also increase the responsibility on the beneficiaries to work with more and more complex technological systems.

This can be thought of as digital welfare exclusion for individuals who cannot register digitally, conduct biometric verification, keep records, access mobile services or fix issues that relate to technology. The rise of this challenge means it is important to look at digital social protection from a human perspective, taking into account not only administrative efficiency, but accessibility, equity and inclusion, and the ability of vulnerable groups to access and sustain access to their social protection entitlements.

1.2 Research Problem and Research Gap

The growing digitization of social protection in Pakistan has changed the process of how vulnerable population is identified, registered, verified and welfare is delivered. Administrative capacity of social protection institutions has strengthened through digital registration, biometric verification, social registries and electronic payment mechanisms, providing opportunities for more transparency and efficiency. But this conversion can also generate new types of exclusion for those who may have challenges accessing or navigating digital welfare systems. Low levels of digital literacy, a lack of mobile phone and internet access, documentation issues, failure in biometric verification, disability, age, gender disparities, poverty and geographical isolation may prevent eligible citizens from accessing and maintaining their social protection benefits. As a result, administrative digitalization can happen while access to beneficiaries is not necessarily equitable and system level efficiency is improved.

Previous studies on social protection in Pakistan have mainly focused on poverty targeting, cash transfers, programme effectiveness, financial inclusion, programme beneficiary identification and the socioeconomic effects of BISP. Digital identification and social registries, biometric verification and digital payment systems have also been subjects of emerging studies and policy reports. But there is little research into digital welfare exclusion as a unique social and professional practice challenge. More significantly, the role of professional social workers in

identification of digitally excluded households, supporting beneficiaries to navigate technology-based welfare systems, documentation and referral, grievance resolution and advocacy of welfare inclusive delivery system is yet to be adequately explored in Pakistani context. This forms an important research gap in the field of digitalization and social protection, digital inequality and professional social work. This study fills this gap by exploring the factors that lead to digital welfare exclusion, as well as the new horizon of social work practice in the development of a more accessible and human-centred digital social protection sector.

1.4 Research Objectives and Questions

Research Objectives

To examine the extent and major socioeconomic, demographic, technological, and institutional factors contributing to digital welfare exclusion among social protection beneficiaries and vulnerable households in Pakistan.

To assess how digital registration, biometric verification, documentation requirements, digital payment mechanisms, and grievance systems influence vulnerable populations' access to and continuity of social protection benefits.

To examine the emerging role of professional social work in addressing digital welfare exclusion and identify practice and policy mechanisms for developing a more inclusive and human-centred digital social protection system in Pakistan.

Research Questions

What is the extent of digital welfare exclusion, and which socioeconomic, demographic, technological, and institutional factors significantly influence the risk of exclusion from digital social protection systems in Pakistan?

How do digital registration, biometric verification, documentation requirements, digital payments, and grievance mechanisms affect vulnerable populations' ability to access and continuously receive social protection benefits?

What role can professional social workers play in identifying and assisting digitally excluded populations, and what social work and policy

interventions can strengthen the inclusiveness of Pakistan's digital social protection system?

1.5 Significance of the Study

This is an important study because it moves the analysis on digital social protection beyond technology and efficiency to an inclusion and human-centred approach. Knowing who is excluded, why they are excluded, and how to tackle it is more important than ever in Pakistan as it grows towards digitalising the identification, registration, verification, payment and monitoring of social protection beneficiaries. The study extends the current understanding of inequality in new digital welfare systems by conceptualizing digital welfare exclusion in a multi-dimensional way affected by technological constraints as well as socioeconomic disadvantage, gender, age, disability, documentation, geography, and institutional accessibility.

The study also contributes to the social work scholarship and practice in Pakistan by recognizing digital welfare exclusion as a growing field for professional interventions. It outlines the social workers' potential involvement in community outreach, digital support, case management, documentation, referral, grievance facilitation, advocacy and exclusion risk identification. The findings can inform social protection institutions to implement assisted-digital and alternative access mechanisms, instead of technology-dependent delivery, at the policy level. Thus, the study can help build a human-centred digital social protection system which is technologically efficient and professionally and community-supported. An action like this can help to ensure that the digitalisation of Pakistan doesn't inadvertently further marginalise its weakest members and will instead help to protect them.

Literature Review

Digitalization has been playing a key role in social protection systems of the present day, changing the way governments identify vulnerable groups, establish eligibility, disburse benefits, make payments, track programmes and react to

socioeconomic shocks. Identification systems, social registers, biometric systems, management information systems and electronic government to person payments are increasingly being used in welfare administration. These technologies can decrease administrative expenses, enhance targeting, reduce duplication, enhance transparency, and speed the delivery of assistance. The International Labour Organization (ILO, 2025) states that digital transformation can help in extending social protection to all, by enhancing enrolment, eligibility verification, information management and service delivery. Likewise, the delivery of modern social protection is characterised by secure digital identification, social registries, digital payment, and integrated information systems, which are all identified by the World Bank (2025a). This change is clearly seen in Pakistan, with the examples of the Benazir Income Support Programme (BISP), the National Socio-Economic Registry (NSER), biometric verification of beneficiaries, and more and more digitized payments. Thus, Pakistan's experience demonstrates the potential of digital public infrastructure for linking ID, data, and welfare payments to enhance administrative efficiency and financial inclusion (World Bank, 2025b).

The development of digital welfare systems has however also raised concerns about the link between digital inequality and social exclusion. Access to digital services is unevenly distributed, especially among populations who are poor, less educated, lacking in connectivity, lack digital skills and living in remote locations. Digital inclusion therefore requires not only the physical presence of technology but also the ability of people to access it, through the necessary resources, skills, knowledge and institutional frameworks. Inclusive digital societies need equitable access to infrastructure, digital literacy and key digital services, especially for women, older people, rural communities and persons with disabilities, prioritizing the World Bank (2025c). In social protection, these disparities can be particularly significant as difficulty with accessing a digital system could impact access to basic income supports. Digital welfare exclusion can thus appear

when technology is designed to promote administrative inclusion and generates additional exclusion of those who are already socially and/or economically disadvantaged.

It is in this context that the Pakistan case is significant. The NSER has established itself as a core tool for vulnerable households' identification for various social protection interventions. By 2025 it was home to about 40 million families and about 84% of the population. However, there were still an estimated 2.2 million households in the poorest 40 percent that were not registered (World Bank, 2025d). The causes of exclusion illustrate that technological modernity must not be de-coupled from physical, informational and administrative accessibility. The World Bank assessment found that almost half of the unregistered households surveyed were not aware of the process of registering for the land, and the distance from registration centres, transport fees, and multiple visits, as well as waiting times and problems for getting identification documents, were all barriers. Geographic inequalities are especially marked: the estimated exclusion probability of households in Balochistan was 26.2 percent, versus 10.5 percent in Khyber Pakhtunkhwa (World Bank, 2025d). These kinds of evidence indicate that a combination of digital systems, administrative processes, geographical factors, and socioeconomic vulnerability is a cause of welfare exclusion.

Digital identity and biometric authentication are other examples of opportunities and risks. Biometric systems can help enhance beneficiary identification, minimize duplication, and deliver payments to the intended beneficiaries. Moreover, the shift towards the use of biometrics in BISP was especially significant for women beneficiaries, as their presence was required at the time of making transfers. Biometric verification has been found to significantly boost women's own receipt and management of cash transfers (World Bank, 2025b). But when beneficiaries encounter a biometric failure or difficulties accessing payment points, there can also be issues of accessibility. The policy challenge is, therefore, not whether digital identification should be used, but how

authentication systems can include effective alternative methods, human assistance, and grievance mechanisms and safeguards to ensure that those who cannot undertake standard digital procedures can still be included in authentication systems.

Gender and socioeconomic inequality also influence people's capacity to leverage digital social protection. Women might have limited access to mobile phones, financial services, identity documents, digital skills, transport and/or decision making. Meanwhile, digital welfare can enhance women's agency over social transfers and engagement with public institutions through well-designed mechanisms. In Pakistan, this combined impact can be seen from the fact that women now have more direct access over transfers via biometric pay-outs and women's differential access to integrated public services has been enhanced through gender-responsive service design features such as separate service counters, female service providers, and targeted outreach (World Bank, 2025e). This means that the digitalization process is not necessarily inclusive or exclusionary; rather, the outcomes of digitalization in terms of distribution are intricately linked to the design of technologies and to the structures of institutional support for vulnerable users.

Older people and people with disabilities are at extra hazards in the technology-based welfare environments. Digital literacy, mobile app or electronic interface issues, reliance on family member, mobility issues, biometric issues may be relevant to older people. People with disabilities may face inaccessible interfaces, communication barriers and physical accessibility issues as well as a lack of institutional support. According to ILO (2024), equitable access to social protection has become even more relevant in times of population ageing, especially when it comes to the intersection of health, income security and long-term care. At the wider level, current disability policy identifies ongoing communication, institutional coordination, service-access and data barriers for persons with disabilities (ILO, 2025). These concerns highlight the need for technology to be accessible and available, and for digital welfare to

include assisted-service options for beneficiaries, as not all beneficiaries have the same technology capabilities.

All this has also got implications for professional social work practice. Social protection is increasingly digital, reliant on databases, digital identities, electronic payments and automated administrative processes, which may also need to be understood by the vulnerable citizens in need of protection. Social workers have the potential to fulfil crucial roles in outreach, identification of excluded households, digital support, case management, documentation support, referral, grievance facilitation, advocacy and coordination of work between communities and welfare institutions. This is especially relevant in situations where administrative digitalization leads to a decrease in the face-to-face interactions between welfare institutions and beneficiaries. It therefore has to be noted that a human-centred approach will need to be complemented by accessible human support, particularly in the context of those who are unable to make their way through the technology-driven welfare system.

The field of digital social protection is gaining attention in the scholarship and policy arena, yet there is a key research gap in Pakistan. The literature so far focuses on social registries, targeting, financial inclusion, programme coverage, administrative efficiency, and digital payments. Empirical work into the concept of digital welfare exclusion as a complex, multidimensional social issue is comparatively limited, with the interactions of gender, age, disability, socioeconomic status, digital literacy, documentation and geographic remoteness not having received much attention. However, the impact of the changes on professional social work has not been sufficiently investigated. This study seeks to fill this gap by analyzing the nature of digital welfare exclusion, not merely as a technological issue, but as a new social protection and social work challenge, and by proposing how professional and community based interventions can work alongside with digital systems for a more inclusive, accessible and human-centred social protection system in Pakistan.

Theoretical and Conceptual Framework

This study is theoretically grounded in the Digital Divide Theory and Person-in-Environment perspective in order to understand the interplay between technological inequalities and pre-existing social vulnerabilities affecting access to digital social protection. The Digital Divide Theory has come a long way since its earliest roots which focused on whether someone 'has' an ICT or not. Current perspectives regard inequality in the use of digital technology as a multi-layered phenomenon characterized by access, abilities, use and outcomes (van Dijk, 2020). This expanded understanding is especially applicable in the context of digital social protection, where owning a mobile phone or having access to the internet does not guarantee that a person can successfully enrol in a welfare programme, undergo biometric verification or complete digital processes, make payments, or file complaints about benefits.

The study uses the digital divide at three interrelated levels. The first-level divide relates to the material access to digital technologies such as mobile devices, internet connection, SIM cards, etc., and other resources needed to access digital welfare solutions. The second level split is on the basis of differences in digital skills and the effective use of technology. Persons might have a mobile phone but lack the literacy, confidence, knowledge, or technical skills to go through the registration, verification, payment or grievance processes. The third level of the divide refers to disparities in the actual results of technology. Digital inequality studies have become more and more focused on the fact that access and digital competence do not necessarily lead to equal social or economic gains (Scheerder et al., 2017; Lutz, 2019). In the field of social protection, this implies that beneficiaries with the same technological access might have different welfare outcomes because of their socioeconomic resources, digital capacities, institutional assistance and capacity to overcome administrative challenges.

This Person-in-Environment perspective is important in the context of digital welfare exclusion and supplements Digital Divide Theory, since it focuses on social work with individuals in

their environments. The Person-in-Environment perspective views the individual's problem as resulting from the interaction between the person and the many environments in which he or she lives. These environments include families, communities and organisations, service delivery systems, socioeconomic structures, cultural conditions and public policies. This approach focuses on the interplay between personal circumstances and structural conditions rather than the individual's shortcomings to explain exclusion. Modern ecological perspectives in social work can also be seen as highlighting relationality between persons, institutions, communities and broader social structures (Matthies & Närhi, 2017). In other words, a woman of advanced age who is not able to complete the digital verification process, a person with a disability struggling with an inaccessible interface, and a rural household without a proper connectivity should not all be simply called technologically incapable. Their absence could be due to technological and institutional setting through which welfare services are delivered not being a good match for individual circumstances.

Based on these views, this study defines digital welfare exclusion as a multi-faceted phenomenon where eligible or potential beneficiaries can struggle to access, navigate, maintain and/or enjoy social protection because of the intersection of digital, socioeconomic, demographic, geographic, and institutional challenges. Digital welfare exclusion can happen in various stages of the welfare delivery chain, from identification, registration and documentation to biometric authentication, welfare eligibility determination, welfare payment receipt, information updating and welfare grievance resolution. Rather, it is understood not as a technological failure, but as a process whereby entrenched social disadvantage may be perpetuated and/or exacerbated by digitally-mediated administrative processes.

The conceptual framework suggests that socioeconomic position, gender, age, disability, education, geographic remoteness, documentation, possession of a device, connectivity and digital literacy are the primary

vulnerabilities that affect digital welfare exclusion. Such factors impact beneficiaries ability to successfully engage in the digital registration, digital verification of biometrics and digital payments and grievance processes. Digital welfare exclusion, in turn, affects social protection outcomes, such as access to benefits, social protection continuity, timely payments, and effective grievance handling. Professional social work intervention is also included in the framework as a protective factor between vulnerability and exclusion. As part of their work, social workers can mitigate the obstacles posed by welfare systems that are increasingly reliant on technology through community engagement, digital support, case management, documentation, referral, advocacy and grievance facilitation to assist vulnerable people. The framework can thus also incorporate technological inequality and social and institutional contexts as well as serving as a starting point for considering digital welfare exclusion as a new social protection challenge and a new area of professional social work practice.

Research Methodology

This study combines a mixed-methods research design for understanding digital welfare exclusion and its significance for social protection and professional social work practice in Pakistan. A convergent mixed-methods design is used, where the quantitative and qualitative data are collected at the same time during the research process, analyzed separately, and finally merged to form a whole understanding of the research problem. The quantitative component aims to measure the level, nature and key drivers of digital welfare exclusion and the qualitative component aims to investigate how beneficiaries experience the welfare process, the challenges faced by the institutions, and how the role of social workers is changing in the context of the digital welfare process. This mixed methods approach is especially relevant as digital welfare exclusion entails socioeconomic and technological inequalities which can only be measured in part, as well as experiences of administrative barriers, dependency, accessibility and institutional

interaction which are not measurable in the same way.

The study population consists of beneficiaries of major social protection programmes and vulnerable households that may be eligible for social assistance, but could face challenges to access digitally mediated welfare services. The study also includes social welfare professionals, social workers, programme officials, community-level workers and representatives of relevant social protection institutions to get institutional and professional perspectives. A multi-stage sampling design is used for quantitative part to choose the respondents in various socioeconomic and geographic locations with a focus on the rural and urban areas. Special attention is paid to groups that may be at risk of being digitally excluded, such as women, the elderly, people with disabilities, low-income families, people with low levels of education, people in geographically isolated communities. Purposive sampling is applied for the qualitative component, where key informants are selected with direct professional and/or institutional experience with social protection delivery, social protection beneficiary management, digital social protection registration, complaints handling and community-level welfare services.

Primary quantitative data are gathered using a structured questionnaire with social protection beneficiaries and with possibly excluded households. The questionnaire captures respondents' demographic and socioeconomic attributes, mobile phone and internet access and usage, digital literacy, documentation status, experience of documentation procedures, biometric verification, electronic payments, access to information, and access to grievance mechanisms. Digital welfare exclusion is considered as the main outcome variable and measured using indicators of the problems or failures in five steps: register, authenticate, determine eligibility, receive the payment, update information, and file a complaint. Gender, age, education, socio-economic status of households, disability, geographical location, documentation,

device ownership, connectivity and digital literacy are key explanatory variables. Through semi structured interviews, social workers, programme officials, social welfare professionals and community level practitioners delve into institutional barriers, experiences of digitally vulnerable beneficiaries, existing mechanisms for assisted access and the potential role played by professional social work in outreach, digital assistance, case management, referral, advocacy and grievance facilitation. Relevant policy documents, programme reports and administrative guidelines are also consulted, to complement the main evidence.

Descriptive and inferential statistical techniques are used to analyze quantitative data. Respondent characteristics and patterns of digital access and exclusion are described using frequencies, percentages, means and standard deviations. Differences in digital welfare exclusion by gender, age, disability, socioeconomic status, education and geographic location are examined through cross tabulations and appropriate tests of association. A composite Digital Welfare Exclusion Index is constructed from barriers along the entire digital welfare delivery process, and socioeconomic, demographic, technological and institutional factors that are significantly associated with exclusion are identified using regression analysis. Qualitative interview data is analysed thematically by coding, categorising and identifying salient themes that emerge from the data on access barriers, administrative experiences, institutional responses and social work interventions. Quantitative and qualitative results are then combined, and areas of convergence, divergence and complementarity are identified. Informed consent, voluntary participation, confidentiality, anonymity, secure handling of the research data, and allowing the respondents to withdraw their participation maintain ethical principles throughout the research process. In engaging vulnerable participants, particular attention is paid to ensure that participating does not affect their eligibility for or access to, or continuation of, a social protection benefit.

Findings and Analysis

5.1 Socio-Demographic and Digital Profile of Respondents

Table 1. Socio-Demographic and Digital Profile of Respondents (N = 400)

Characteristics	Category	Frequency	Percentage
Gender	Male	148	37.0
	Female	244	61.0
	Other/Prefer not to say	8	2.0
Age	18–30 years	92	23.0
	31–45 years	154	38.5
	46–60 years	98	24.5
	Above 60 years	56	14.0
Residence	Urban	168	42.0
	Rural/Remote	232	58.0
Education	No formal education	112	28.0
	Primary	96	24.0
	Secondary	108	27.0
	Higher secondary or above	84	21.0
Disability	Person with disability	52	13.0
	No reported disability	348	87.0
Personal mobile phone	Yes	238	59.5
	No	162	40.5
Smartphone access	Yes	196	49.0
	No	204	51.0
Regular internet access	Yes	174	43.5
	No	226	56.5

The respondents represented diverse socioeconomic and digital circumstances, with women constituting 61.0% of the sample and rural or remote residents accounting for 58.0%. The digital profile reveals considerable inequality in access to technology. Although 59.5% reported having a personal mobile phone, only 49.0% had access to a smartphone and 43.5% had regular internet access. Limited formal education was also

widespread, with 52.0% having either no formal education or education only up to the primary level. These characteristics indicate that the population targeted by social protection programmes contains substantial groups for whom the transition towards increasingly digital welfare delivery may create additional accessibility challenges.

5.2 Access to Digital Social Protection Services

Table 2. Respondents' Access to Digital Social Protection Services

Digital Social Protection Service	Accessed (%)	Successfully Accessed with Assistance (%)	Unable to Access (%)
Digital/technology-assisted registration	48.5	34.0	17.5
Beneficiary information/status checking	42.0	35.5	22.5
Biometric verification	69.0	18.5	12.5
Digital/electronic payment services	61.5	25.0	13.5
Updating beneficiary information	38.5	36.0	25.5
Grievance/complaint mechanism	31.0	33.5	35.5

The findings demonstrate that formal availability of digital services does not necessarily translate into independent accessibility. While 69.0% successfully completed biometric verification and 61.5% accessed electronic payment services without assistance, independent access was substantially lower for information updating (38.5%) and grievance mechanisms (31.0%). A considerable proportion relied on assistance from family members, programme staff, community

members, or intermediaries. The particularly high level of difficulty associated with grievance mechanisms is significant because beneficiaries experiencing registration, verification, or payment problems may simultaneously lack the capacity to access the mechanisms intended to resolve those problems. The results therefore distinguish between nominal digital coverage and meaningful beneficiary-level accessibility.

5.3 Digital Literacy and Welfare-System Navigation

Table 3. Digital Literacy and Ability to Navigate Welfare Services

Digital Capability	Independently (%)	With Assistance (%)	Unable (%)
Read SMS notifications	50.5	30.0	19.5
Understand welfare-related messages	44.5	35.0	20.5
Check beneficiary/payment status	39.0	38.5	22.5
Complete technology-assisted procedures	31.5	42.0	26.5
Use mobile financial services	35.0	37.5	27.5
Lodge a complaint/grievance	27.5	35.0	37.5

The results indicate that digital literacy represents an important barrier between technological availability and effective welfare access. Only half of respondents could independently read SMS notifications, while fewer could understand welfare-related digital information, check their status, or use mobile financial services without assistance. The greatest difficulty concerned grievance navigation, with only 27.5% able to

independently lodge a complaint. Dependence on others was particularly evident for technology-assisted procedures, where 42.0% required assistance. These findings support the distinction between first-level digital access and second-level inequalities in skills and usage. They suggest that possession of a phone or access to connectivity cannot by itself be considered evidence of digital inclusion within social protection.

5.4 Documentation and Biometric Verification Barriers

Table 4. Documentation and Biometric Verification Barriers

Barrier Experienced	Frequency	Percentage
Expired/incomplete identity documentation	86	21.5
Difficulty updating household information	104	26.0
Biometric verification failure at least once	98	24.5
Repeated visits required for verification	116	29.0
Distance to registration/verification facility	142	35.5
Transportation/associated financial cost	154	38.5
Lack of information about required documents	126	31.5
No major documentation/verification difficulty	144	36.0

Documentation and biometric difficulties constituted an important administrative dimension of digital welfare exclusion. More than one-third of respondents reported distance-related difficulties, while 38.5% identified transportation and associated costs as barriers. Almost one-quarter had experienced biometric verification failure at least once, and 29.0% reported making repeated visits to complete verification. These findings demonstrate that apparently digital

processes remain strongly connected to physical infrastructure, documentation systems, mobility, and household resources. Digital exclusion therefore cannot be understood exclusively in terms of internet or device access. When beneficiaries must repeatedly travel to resolve authentication or documentation problems, the financial and geographic burden of accessing social protection may disproportionately affect already vulnerable households.

5.5 Digital Payment and Benefit-Access Challenges

Table 5. Challenges in Digital Payment and Benefit Access

Payment-Related Challenge	Frequency	Percentage
Difficulty understanding payment procedures	118	29.5
Biometric failure during payment collection	91	22.8
Long distance to payment point	137	34.3
Long waiting time/repeated visits	146	36.5
Dependence on another person for payment access	124	31.0
Payment delay/interruption experienced	102	25.5
Difficulty confirming payment status	129	32.3
No major payment-related difficulty	158	39.5

Although digital payments have the potential to improve transparency and reduce administrative

leakage, the findings reveal important beneficiary-level challenges. Long waiting periods or repeated

visits were reported by 36.5% of respondents, while 34.3% identified distance to payment facilities as a barrier. Nearly one-third depended on another person to navigate payment procedures, and 25.5% had experienced delayed or interrupted benefits. Particularly important is the interaction between technological and conventional barriers: biometric authentication,

digital payment information, physical payment locations, and beneficiary mobility operate as interconnected components of the same delivery system. Digitalization may therefore increase efficiency at the institutional level while still generating substantial transaction costs for beneficiaries unless appropriate assisted-access mechanisms are available.

5.6 Patterns and Determinants of Digital Welfare Exclusion

Table 6. Logistic Regression Predicting Digital Welfare Exclusion

Predictor	Odds Ratio (OR)	95% CI	p-value
Female gender	1.54	1.03–2.31	.036*
Age 60 years and above	2.21	1.31–3.73	.003**
No/primary education	1.88	1.24–2.85	.003**
Disability	1.79	1.02–3.14	.043*
Rural/remote residence	1.96	1.29–2.98	.002**
No personal smartphone	2.34	1.52–3.60	<.001***
Irregular/no internet access	1.82	1.18–2.80	.007**
Low digital literacy	3.17	2.02–4.97	<.001***
Documentation difficulties	2.06	1.35–3.14	.001**

*Note: OR = Odds Ratio; CI = Confidence Interval. *p < .05, **p < .01, ***p < .001.

The multivariate analysis indicates that digital welfare exclusion is shaped by a combination of technological, socioeconomic, demographic, and geographic disadvantages. Low digital literacy emerged as the strongest predictor, with respondents possessing limited digital capabilities being more than three times as likely to experience exclusion. Lack of a personal smartphone, older age, documentation difficulties, and rural or remote residence also substantially increased the likelihood of exclusion. Gender, disability, and

lower educational attainment remained statistically significant after controlling for other characteristics. These findings demonstrate that digital welfare exclusion is not randomly distributed; rather, it tends to concentrate among populations already facing forms of social disadvantage. Digitalization may consequently reproduce existing inequalities when welfare systems do not incorporate appropriate accessibility and assisted-service safeguards.

5.7 Experiences of Vulnerable and Excluded Households

Table 7. Reported Experiences of Vulnerable and Digitally Excluded Households

Experience	Frequency	Percentage
Needed family/community assistance	176	44.0
Made repeated visits to resolve a problem	148	37.0
Did not know where to seek assistance	132	33.0
Experienced temporary interruption of benefits	101	25.3
Paid transportation/other costs to resolve issue	157	39.3

Relied on an intermediary for digital procedures	121	30.3
Abandoned a procedure at least once	73	18.3
Felt digital procedures were difficult to understand	169	42.3

The experiences of vulnerable households demonstrate the human consequences of administrative digitalization. Approximately 44.0% required assistance from family or community members, while 42.3% considered digital procedures difficult to understand. More than one-third made repeated visits to resolve welfare-related problems, and 39.3% incurred transportation or other costs in doing so. Particularly concerning is that 18.3% reported

abandoning a welfare-related procedure at least once because they could not successfully complete it. These findings suggest that exclusion can occur incrementally rather than through a single formal rejection. Repeated technological, informational, financial, and administrative barriers can create what may be described as an accumulated exclusion burden, eventually discouraging vulnerable beneficiaries from continuing to pursue their entitlements.

5.8 Institutional and Social Work Perspectives

Table 8. Key Themes from Interviews with Institutional and Social Work Stakeholders (n = 30)

Major Theme	Participants Mentioning Theme	Percentage
Limited digital literacy among beneficiaries	26	86.7
Need for assisted-digital services	25	83.3
Documentation and biometric difficulties	23	76.7
Inadequate community-level outreach	22	73.3
Weak beneficiary grievance support	21	70.0
Need for stronger social worker involvement	26	86.7
Limited professional digital-social-work capacity	20	66.7
Need for institutional coordination/referral	24	80.0
Privacy and data-protection concerns	18	60.0

The qualitative findings reinforce the household-level evidence and highlight the need for a stronger human-support component within digital social protection. Most interviewed stakeholders identified limited beneficiary digital literacy and insufficient assisted-digital services as major challenges. Significantly, 86.7% considered stronger involvement of social workers important, while 80.0% emphasized improved institutional coordination and referral mechanisms. Participants viewed social workers as potentially important intermediaries who could identify digitally excluded households, provide outreach and digital assistance, facilitate documentation, undertake case management, support grievances, and connect beneficiaries with appropriate

institutions. However, the interviews also indicated that social work practice itself requires adaptation, including digital-skills development, clearer institutional roles, referral protocols, and awareness of privacy and data-protection responsibilities. The findings therefore support a human-centred model in which technological modernization is complemented rather than substituted for by professional and community-based support.

Discussion

The findings indicate that there is a fine balance in the digital social protection system in Pakistan as digitalization can enable inclusion and also generate digital forms of exclusion. The high levels

of successful verification of biometric identity and access to electronic payment systems, which were seen in this study, suggest that digital systems can enhance the effectiveness, transparency and reach of the delivery of welfare. This aligns with the International Labour Organization's claim that interoperable information systems, digital identification, and technology-driven service delivery can facilitate enrolment, eligibility verification and benefit administration (ILO, 2025a). Meanwhile, the current findings indicate that a majority of the respondents still relied on support to register, update information, check the status and grievance. This indicates that the mere digitalisation of administration does not necessarily mean meaningful access at beneficiary level. Further, the recently released 2025 National Socio-Economic Registry (NSER) assessment by the World Bank highlights that high coverage of the NSE Registry is possible with a substantial level of exclusion, especially for poor families lacking information, for those residing too far from registration centers, and for those facing administrative hurdles. Digital welfare programs can thus produce a new type of inequity: those who are able to complete technology-dependent bureaucratic procedures are eligible for welfare programs, while those who are not may not be. This aligns with the broader international perspective that digitalization must go hand-in-hand with inclusive design, alternative access mechanisms, and safeguards to prevent the modernization of social protection undermining the overall goal of universal and equitable social protection (ILO, ISSA, & OECD, 2025).

The results also show that digital welfare exclusion is not equally distributed among different economic and social groups and demographic groups. Significant factors that had a large impact on the likelihood of exclusion were low digital literacy, older age, limited education, disability, rural residence, lack of access to a smartphone and poor connectivity. The patterns indicate that digital welfare exclusion is driven by, and can amplify, social inequalities and not just a technological issue. Gender is especially significant when considering the additional

constraints that women may experience in relation to access to devices, mobility, literacy, access to financial services, and control over technology. UN Women (2024) highlights that social protection systems must not only take into account gendered inequality in access, coverage and enjoyment of social and economic rights, but also be effective. Similarly, the current study results suggest that women were more likely to be excluded from digital welfare than men, accounting for other attributes. Additional barriers were age and disability, especially when they necessitated independent use of mobile interfaces, frequent travel, or successful biometric authentication for accessing welfare systems. These results align with the ILO's general focus on keeping social protection systems accessible to people who, due to their age, disability, economic situation, or social status, may not be able to independently engage with digital systems (ILO, 2025b). Geographic inequality is particularly important in Pakistan, with the World Bank identifying a significantly higher risk of exclusion from the NSER for households in Balochistan compared to households in several other provinces (World Bank, 2025). The study thus reveals that digital exclusion is manifested on various intersecting layers of gender, age, disability, education, poverty, and geographical location. The institutional findings also indicate that the exclusion from digital welfare is not only influenced by the characteristics of the beneficiaries, but also by the organization and accessibility of social protection institutions. Important barriers identified by respondents were: documentation difficulties, biometric verification failures, repeated visits, weak grievance mechanism and distance from service facilities. These issues show that digital systems are still highly reliant on administrative capacity and institutional coordination, as well as the quality of information and the infrastructure of physical services. The ILO (2026) highlights that effective management information systems, institutional interoperability, coordinated administration, and governance capacity are all essential for digital transformation of social protection. The lack of

these foundations can actually lead to a replication of the existing bureaucratic fragmentation on digital platforms. This study also confirmed that documentation problems were significantly associated with the digital welfare exclusion. Additionally, qualitative participants highlighted suboptimal referral systems, insufficient support for beneficiaries, and insufficient outreach. These results indicate an institutional paradox: that digital systems can save individuals time and effort in routine administrative processes, but can also amplify the impact of making mistakes on record or having issues with identity verification if they are unable to independently rectify the mistake or address the problem. Similarly, the World Bank NSER analysis highlights limited contact with responsible institutions, physical distance and lack of awareness as factors that affect exclusion (World Bank, 2025). Thus, digital welfare inclusion can only be assured by both technological sophistication and responsive institutions that are able to offer welfare human support when the digital process fails.

The findings are significant for professional social work practice as the digitalisation affects the nature of the interaction between vulnerable citizens and welfare institutions. Social workers have traditionally participated in the areas of assessment, case management, referral, advocacy, outreach and linkage of vulnerable groups to the available social services. As the administration of welfare is becoming more and more digital, there is a new professional duty: supporting people in using digital systems that are increasingly determining access to fundamental social protection rights. Qualitative data revealed high level of support by institutional stakeholders to implement more social workers in delivering digital assistance, documentation support, grievance facilitation, community outreach and referral. This indicates that digital welfare navigation has become an acceptable new strand of social work practice. Therefore, a human-centred social protection system should not presume all beneficiaries will be able to access a digital platform without assistance. Rather, social workers and community-based actors can serve as

an interface that diminishes gaps in information, identifies households susceptible to exclusion, and provides access to registration and grievance procedures, and helps to keep vulnerable citizens out of the exclusionary process when they are unable to access it for technological reasons. This aligns with the latest international trends of actively promoting people-centred and coordinated digital social protection instead of technology-driven administration as a one-off solution (ILO, ISSA and OECD, 2025). Thus, social work practice needs to evolve, moving from low tech to high tech, including digital literacy, data ethics, privacy awareness, digital case management, and technology-assisted advocacy within the professional preparation and institutional practice of social workers.

The results are very conducive to the integration of Digital Divide Theory with the Person-in-Environment approach. Digital Divide Theory can be used to look at access to digital technology alone being insufficient to ensure successful participation in digital welfare systems. The evidence shows significant disparities at the three levels of digital inequality: some respondents lacked devices or connectivity, others had access to devices and connectivity, but lacked skills to use them, and still others had devices, connectivity, and skills, but were unable to achieve desired welfare outcomes due to the barriers of biometric, documentation, payment, or grievance. This validates the fact that digital inequality is not merely having access to a device, but the capacity to turn digital access into real social change. This is further supported by the Person-in-Environment perspective that reveals the exclusion is the outcome of the interplay between person vulnerabilities and institutional environments. As one example, an older adult who does not have skilful digital abilities may feel excluded not only because of his/her age, but because digital navigation and interaction with welfare methods are required without the presence of any human support. The lack of roads, difficulty with mobility, low levels of literacy, documentation issues, and limited access to local institutions can also cause a rural woman to be excluded. The results hence

indicate that digital welfare exclusion is to be considered as a relational and multidimensional phenomenon and not as an individual fault. The theoretical novelty of the study is the proof that digital inequalities turn into welfare inequalities if technological-supported administrative systems are not considering diverse social, economic, physical and geographical conditions. This offers a solid foundation for a human-centred digital social protection system that goes beyond technological innovation and involves inclusive institutional design, access facilitation, and good social work practice.

7. Human-Centred Digital Social Protection and Policy Implications

7.1 Assisted Digital Access for Vulnerable Populations

Pakistan's digital social protection system should adopt an assisted-digital approach that combines technological efficiency with accessible human support. The findings demonstrate that many beneficiaries, particularly older persons, persons with disabilities, individuals with limited education, rural populations, and those with low digital literacy, cannot independently navigate registration, biometric verification, payment, information-updating, and grievance procedures. Social protection institutions should therefore establish assisted-digital facilities at accessible community and local-government levels where trained personnel can help beneficiaries complete digital procedures without relying on informal intermediaries. Digitalization should complement rather than completely replace face-to-face service delivery. Maintaining alternative and assisted channels would reduce the risk that technological capability becomes an unintended condition for exercising social protection entitlements.

7.2 Integrating Social Workers into Digital Welfare Delivery

Professional social workers should be formally integrated into the delivery architecture of digital social protection rather than being limited to conventional welfare and community-service functions. Social workers can serve as a human

interface between vulnerable citizens and increasingly technology-dependent welfare institutions by identifying digitally excluded households, assisting with registration and documentation, facilitating referrals, supporting grievance resolution, and advocating for beneficiaries facing repeated administrative barriers. Their professional understanding of vulnerability, family circumstances, disability, ageing, gender inequality, poverty, and community conditions can complement technology-based targeting mechanisms. Integrating social workers into digital welfare programmes would therefore strengthen the capacity of institutions to identify circumstances that administrative databases may overlook and help ensure that digital modernization remains responsive to the lived realities of vulnerable populations.

7.3 Community-Based Outreach and Case Management

Digital social protection should move beyond a system that primarily expects vulnerable citizens to approach institutions and instead develop proactive community-based outreach mechanisms. The findings indicate that lack of information, geographic remoteness, mobility constraints, digital limitations, and uncertainty regarding administrative procedures can prevent eligible households from successfully accessing welfare services. Social workers and trained community-level personnel should identify households at risk of digital exclusion, provide information and initial digital assistance, and refer complex cases to relevant institutions. Case management should be particularly strengthened for households experiencing multiple and recurring barriers, including disability, old age, documentation problems, biometric failure, or benefit interruption. A community-based approach would shift digital welfare delivery from reactive problem resolution towards early identification and prevention of exclusion.

7.4 Accessible Grievance and Referral Mechanisms

An inclusive digital social protection system requires grievance mechanisms that are as accessible as the benefits themselves. The study indicates that grievance navigation represents one of the most difficult components of digital welfare access, creating the possibility that beneficiaries experiencing technological or administrative problems may simultaneously be unable to access mechanisms for resolving them. Pakistan's social protection institutions should therefore maintain multiple grievance channels, including digital, telephone, face-to-face, and community-assisted mechanisms. Cases involving failed biometric verification, incorrect household information, documentation difficulties, interrupted payments, or disputed eligibility should have clearly defined referral pathways and reasonable resolution timelines. Social workers can play an important role in documenting complex cases, facilitating institutional referrals, tracking unresolved grievances, and ensuring that vulnerable beneficiaries are not repeatedly redirected between agencies.

7.5 Digital Literacy and Professional Capacity Building

Digital literacy should be treated as an essential component of social protection inclusion rather than as a separate technology-sector concern. Beneficiaries should receive practical guidance on reading programme messages, checking benefit status, protecting personal information, using digital payment mechanisms, recognizing fraud, and accessing official grievance channels. However, beneficiary capacity building must be accompanied by professional development among social workers and welfare personnel. Social work education and in-service training should increasingly incorporate digital welfare navigation, digital case management, data literacy, technology-assisted practice, online communication, and identification of digital exclusion risks. Strengthening both beneficiary and professional capabilities would reduce dependency on informal intermediaries and enable social workers to

perform effectively within an increasingly digital social protection environment.

7.6 Data Protection, Privacy, and Ethical Safeguards

The expansion of digital social protection generates significant ethical responsibilities because welfare institutions increasingly collect and process sensitive socioeconomic, demographic, identity, biometric, and household information. Strong safeguards are therefore required to ensure that administrative efficiency does not compromise beneficiaries' privacy, dignity, confidentiality, or control over personal information. Social protection institutions should apply clear principles concerning informed consent, purpose limitation, secure data storage, controlled information sharing, accountability, and mechanisms for correcting inaccurate records. Particular attention should be given to vulnerable beneficiaries who may provide biometric or personal information without fully understanding how their data will be used. Social workers should also receive training in digital ethics and confidentiality so that their expanding role in digital assistance and case management does not unintentionally expose beneficiaries to privacy risks. A human-centred digital welfare system must therefore combine technological innovation with rights-based data governance and professional ethical standards.

8. Conclusion

Digital transformation of social protection is a key transformation in the process of social protection administration and delivery in Pakistan. Digital recording, social registries, biometric verification, electronic payment, and management of beneficiaries using data have opened up a whole range of opportunities for more efficiency, transparency, targeting, and accessibility. But as shown in this study, technological modernization is not a guarantee of universal or equitable access. Digitalisation can, at the same time, contribute to the inclusion and exclusion of welfare as vulnerable groups may not have the technological resources, capabilities, documentation, connectivity or institutional supports needed to

successfully navigate a more and more digitalised welfare system. Digital social protection must therefore be measured not just in terms of administrative efficiency, but also for its ability to provide meaningful and sustained access for vulnerable citizens.

The results show that digital welfare exclusion is a multi-faceted process and is strongly related to pre-existing socioeconomic inequalities. Digital literacy was found to be a significant factor and the lack of this, combined with low education, old age, disability, gender inequalities, lack of personal digital devices, poor connectivity, difficulties with documentation, and rural or geographically remote living situations, contributed to the risk of exclusion. These factors do not typically act alone. Rather, several disadvantages can overlap and stack up at various stages of the welfare delivery process—including registration, beneficiary identification, biometric authentication, payment receipt, information updating and grievance redressing. Digital welfare exclusion should therefore not be seen as merely a lack of access to technology but simply as a dynamic between technological demands and other social, economic, demographic, geographical and administrative disparities.

The study further shows that there is an important institutional dimension to digital welfare exclusion. Documentation issues, multiple visits, distance to facilities, payment issues, lack of information about beneficiaries, and difficulties with digital access can also be sources of exclusion, both in the design and implementation of welfare systems and as a digital limitation. Digital social protection is therefore critically reliant on institutional capacity to identify and reach beneficiaries who are unable to successfully complete a standardized digital process. The shift towards digital welfare in Pakistan should thus continue to ensure assisted and alternative access to welfare alongside the technological system. To avoid that administrative digitalisation disproportionately impacts existing inequalities, accessible grievance mechanisms, effective referral pathways, community level facilitation, human

review of complex cases and proactive identification of excluded households are key.

A significant aspect of this study was that it has identified digital welfare exclusion as a new domain of social work practice in Pakistan. The role of the social worker can be a key liaison between vulnerable people and the social protection system, as the relationship between citizens and social protection institutions is becoming more and more mediated with technology. Their tasks might involve identifying households at risk of digital exclusion, digital assistance, documentation, community outreach and case management, institutional referrals, grievances, and advocacy for those who are experiencing ongoing challenges. This new role does need some investments in professional capacity (digital literacy, data management, technology assisted practice, privacy awareness, and digital ethics). Incorporating professional social work into digital welfare service provision can thus play a key role in ensuring that technological efficiency is matched with human support, social understanding and rights-based practice.

The study recommends that, overall, the future of social protection in Pakistan should not be viewed as a “digital versus conventional welfare delivery” dichotomy, but as a chance to build a human-centred digital social protection system. This system should integrate technological innovation, digital access assistance, community-based outreach, professional social work intervention, accessible grievance mechanisms and a high level of data-protection safeguards. Overall, the effectiveness of digital transformation must be evaluated in terms of the increased access it affords to social protection for the people who need it most, not in terms of making the administration of welfare more technologically advanced. This study poses digital welfare exclusion as an issue of digital inequality, social protection and professional social work, offering a framework to rethink the policy of digital welfare in Pakistan, highlighting as a core principle that technological modernization should not increase barriers to

social protection, but instead reinforce social inclusion, dignity and equitable access.

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