



The Role of Digital Economy in Reducing Unemployment and Informal Labour

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ARTICLE DETAILS	ABSTRACT
History Revised format: May, 2025 Available Online: Jun, 2025 Keywords digital economy, unemployment reduction, informal labour, job creation, labour market matching, digital platforms	In the context of global labour market shifts, the digital economy has emerged as a potent mechanism for reducing unemployment and formalising informal labour. This article examines how digital technologies, digital platforms, and digital infrastructure contribute to job creation, better labour market matching, and the transition of workers from informal to formal employment. Focusing on developing economies and drawing on recent studies, the paper identifies key pathways through which the digital economy can reduce unemployment and the size of informal labour, while also highlighting potential risks such as job substitution, digital divide and precarious work. Special attention is given to the Pakistani context, where informal employment remains large and digital opportunities are growing. The article proposes policy recommendations to harness the digital economy for inclusive employment growth, especially for low skilled and vulnerable workers. The findings suggest that while the digital economy offers significant promise for employment formalization and unemployment reduction, concerted strategies are needed to ensure digital access, skills development and supportive regulatory frameworks.

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Introduction:

The concept of the “digital economy” has gained prominence in recent years as nations continue the transition from traditional industry- and agriculture-based employment toward knowledge, services and technology-enabled work. According to the International Labour Organization (ILO), the digital economy broadly incorporates all economic activity reliant on or significantly enhanced by digital technologies, digital infrastructure, digital services and data. In many developing countries, a large share Of workers remain in the informal labour market characterised by unregistered employment, lack of social protection, low productivity and precarious working conditions. The informal sector is estimated to employ 60 % or more of workers in the lowest-income regions. This dual challenge high unemployment and large informal labour forces poses a major policy issue for countries such as Pakistan. At the same time, digital technologies provide new avenues for employment generation, improved matching between job seekers and employers, and formalization of previously informal activities. For example, widened internet and platform access can reduce job search costs and increase labour-market efficiency. Given this backdrop, this article explores the role of the digital economy in reducing unemployment and informal labour. It evaluates the mechanisms through which digitalization can support employment, addresses the constraints and risks, and proposes policy directions suited for

Pakistan and similar developing-economy contexts. In many **developing countries**, unemployment and informal labour are deeply interconnected, forming a complex and often entrenched economic structure. The **static picture** of this nexus reflects high unemployment rates, particularly among the youth and women, and the prevalence of informal employment, which refers to jobs that are not regulated or protected by formal labour laws. Informal labour typically includes workers in agriculture, street vending, domestic work, and small-scale enterprises. These jobs are often characterized by low wages, lack of social security, absence of legal protections, and unstable working conditions. Informal employment is particularly pervasive in developing countries due to factors such as limited access to education, lack of skills training, inadequate infrastructure, and regulatory gaps.

The Role of Digital Economy in Reducing Unemployment and Informal Labour:

Expansion of Digital Employment Opportunities:

The digital economy has significantly changed the structure of employment by creating a wide range of new occupations that did not exist in traditional labour markets. The increasing use of computers, smartphones, internet services, cloud systems, artificial intelligence, and digital platforms has generated demand for workers in software development, website management, graphic design, data analysis, cyber security, content creation, online teaching, digital marketing, and customer support. These employment opportunities are not limited to large technology companies. Banks, hospitals, educational institutions, manufacturing firms, government departments, retail businesses, and non-profit organizations increasingly require employees with digital skills. As a result, the digital economy has expanded the number of sectors in which individuals can find productive employment. One of the most important contributions of digital employment is its ability to connect workers with jobs beyond their local areas. In traditional labour markets, unemployed individuals often depend on employment opportunities available within their cities or regions. Digital platforms allow workers to provide services to employers and clients located in other provinces or countries. This geographical flexibility is particularly beneficial for people living in rural or economically underdeveloped areas where formal job opportunities are limited. A skilled person with an internet connection can participate in international projects without moving to a major urban Centre. Digital employment also creates opportunities for individuals with different levels of education and experience. Highly qualified workers can obtain jobs in programming, data science, engineering, and information security, while people with basic digital skills can work in data entry, online sales, delivery coordination, virtual assistance, or social media management. Therefore, the digital economy can reduce unemployment by providing multiple pathways into employment. However, the quality of these opportunities depends on digital access, training, fair recruitment practices, and the availability of reliable technological infrastructure.

Growth of Freelancing and Remote Work:

Freelancing and remote work are among the most visible forms of employment created by the digital economy. Freelance platforms enable individuals to offer professional services directly to clients without being permanently employed by a single organization. Common freelance services include writing, translation, graphic design, video editing, software development, accounting, consulting, online tutoring, research assistance, and administrative support. These platforms can reduce unemployment by helping skilled individuals earn income even when formal organizations are not hiring permanent staff. Remote work has also expanded employment opportunities by allowing organizations to recruit workers from different geographical locations. A company can hire employees based on their skills rather than their physical proximity to an office. This arrangement reduces transportation costs, relocation expenses, and other barriers that may prevent people from accepting employment. Remote work is particularly useful for women with family responsibilities, persons with disabilities, students, and individuals living far from major commercial centers. It can improve labour-force participation by making employment more flexible and accessible. Freelancing can also provide an important source of foreign income for developing countries. Workers who provide digital services to international clients may earn in foreign currencies and contribute to national export revenues. Governments can support this sector by developing reliable payment systems, improving internet connectivity, offering professional training,

and simplifying taxation procedures for freelancers. Proper recognition of freelance income can also encourage workers to register their activities and enter the formal economy. Despite its benefits, freelancing may involve unstable income, delayed payments, lack of employment contracts, and limited access to social security. Many platform workers remain economically informal even though they use digital systems. Governments should therefore establish legal frameworks that recognize freelancers and remote workers as legitimate economic participants. Social protection programs, dispute-resolution systems, health insurance, pension schemes, and fair payment regulations can make digital work more secure and help transform it into a sustainable form of formal employment.

Development of E-Commerce and Online Businesses:

E-commerce has become a major source of employment and business development in the digital economy. It allows individuals and companies to sell goods and services through websites, mobile applications, social media pages, and online marketplaces. Starting an online business usually requires less capital than establishing a traditional physical store because entrepreneurs can avoid high rental expenses, large inventories, and extensive office facilities. This lower entry cost enables unemployed individuals to establish small enterprises and create their own sources of income. Online businesses generate employment not only for business owners but also for many supporting workers. The growth of e-commerce increases demand for product photographers, website developers, delivery riders, warehouse employees, packaging workers, customer-service representatives, digital advertisers, payment-system operators, and supply-chain managers. Even a small online store may create economic opportunities for several people. As online businesses expand, they can become registered companies and employ workers under formal contracts'-commerce can also help traditional informal businesses become part of the formal economy. Many small traders and home-based producers operate without registration, financial records, or access to banking services. By joining an online marketplace, they may be required to create business accounts, use digital payments, maintain transaction records, and comply with platform rules. These practices increase transparency and can encourage formal registration. Digital sales records also make it easier for entrepreneurs to apply for loans because financial institutions can evaluate their income history and business performance. Women and rural producers can benefit significantly from e-commerce. Handicraft makers, food producers, farmers, clothing sellers, and household entrepreneurs can reach customers outside their local communities. Digital platforms allow them to advertise products and receive orders without opening expensive physical outlets. However, the success of e-commerce depends on affordable internet access, efficient delivery services, consumer trust, digital payment systems, and protection against online fraud. Government policies that strengthen these areas can increase employment creation and reduce the size of the informal economy.

Promotion of Digital Entrepreneurship:

Digital entrepreneurship plays an important role in reducing unemployment because it encourages individuals to create businesses rather than depend entirely on existing employers. The digital economy provides entrepreneurs with tools to develop mobile applications, online educational services, consulting platforms, digital media companies, software products, financial technology solutions, and internet-based retail businesses. Many digital enterprises can begin with limited financial resources, especially when entrepreneurs use cloud services, social media marketing, and online collaboration tools. Digital entrepreneurs can respond quickly to social and economic needs. For example, they can create applications for transportation, healthcare appointments, agricultural information, education, food delivery, financial management, and professional services. These businesses may solve practical problems while generating employment for programmers, administrators, customer-service staff, drivers, sales representatives, and technical specialists. Successful start-ups can expand rapidly and create large numbers of jobs. The development of digital entrepreneurship also strengthens innovation within the economy. New businesses introduce modern methods, improve competition, and encourage established companies to adopt advanced technologies. This process can increase productivity and create new industries. Universities and technical institutions can support digital entrepreneurship by establishing business incubators, innovation laboratories, and mentorship programs. Students and

graduates can receive guidance on business planning, product development, market research, financing, and legal registration. Access to finance remains an important challenge for digital entrepreneurs, particularly in developing countries. Banks may hesitate to support start-ups that lack physical assets or a long financial history. Governments can address this problem through start-up funds, low-interest loans, tax incentives, and public-private investment programs. Simplified online registration procedures can also encourage entrepreneurs to formalize their businesses. When digital enterprises are officially registered, they can sign contracts, hire workers legally, pay taxes, and receive institutional support. Therefore, digital entrepreneurship can reduce both unemployment and informal economic activity when it is supported by appropriate policies and financial systems.

Formalization through Digital Payments and Registration:

Digital payment systems and online registration services can help governments reduce informal labour by making economic transactions more visible and traceable. Informal workers and small enterprises often operate outside official systems because cash transactions are difficult to monitor and traditional registration procedures may be expensive, complicated, or time-consuming. Mobile banking, electronic wallets, online invoicing, and digital business accounts create records of income and expenditure. These records can improve transparency and encourage participation in the formal economy. When workers receive payments through regulated digital channels, they can build a financial history. This history may help them qualify for loans, housing finance, insurance, and other financial services. Small business owners who previously depended entirely on cash can use digital transaction records to demonstrate their earnings. Financial inclusion can therefore support business growth and improve economic security. It also reduces dependence on informal lenders who often charge high interest rates. Online registration systems can make business formalization easier. Instead of visiting multiple government offices, entrepreneurs may register their companies, obtain tax numbers, apply for licenses, and submit documents through digital portals. Simplified procedures reduce administrative costs and encourage informal businesses to become legally recognized. Governments can further support formalization by offering lower registration fees, temporary tax relief, and training to newly registered enterprises. However, digital formalization should not be based only on taxation and control. Informal workers are more likely to register when they receive meaningful benefits in return. These benefits may include access to healthcare, pensions, unemployment support, business loans, legal protection, and government contracts. Digital systems can help governments connect registration with social protection programs. For example, a self-employed worker who registers online could automatically become eligible to contribute to a pension or insurance scheme. In this way, digital technology can make formal employment more attractive and accessible rather than simply increasing regulatory pressure on vulnerable workers.

Improvement of Skills through Digital Education:

Digital education is essential for reducing unemployment because many modern jobs require technical and professional skills that traditional education systems may not provide. Online learning platforms, virtual classrooms, mobile applications, and digital training programs allow individuals to learn new skills at relatively low cost. Courses in programming, graphic design, digital marketing, e-commerce, communication, accounting, data analysis, cyber security, and entrepreneurship can improve the employability of unemployed workers. Online education is especially useful for people who cannot attend regular institutions because of distance, financial limitations, family responsibilities, or employment schedules. Learners can study at home and complete courses at flexible times. This flexibility allows workers to improve their qualifications without leaving their current jobs. It also gives unemployed individuals an opportunity to develop marketable skills while searching for employment. Digital training can help informal workers increase their productivity and transition into formal occupations. For example, a small shop owner can learn digital accounting and online sales, while a home-based worker can learn social media marketing and customer management. Farmers can use digital platforms to obtain information about markets, weather, crop management, and agricultural prices. These skills can improve income and connect informal workers with formal supply chains.

Governments should ensure that digital education is linked to actual labour-market needs. Training programs should be developed in consultation with employers, industry associations, and technology companies. Certificates should be recognized by employers so that learners can demonstrate their abilities. Public institutions can provide free or subsidized courses to unemployed youth, women, rural residents, and low-income groups. Digital education alone cannot solve unemployment if learners lack devices, internet access, or practical experience. Training programs should therefore include internships, mentorship, project-based learning, and employment placement services. Community technology centers can provide computers and internet facilities to disadvantaged groups. By combining digital skills with career guidance and access to employment platforms, governments can improve job matching and reduce long-term unemployment.

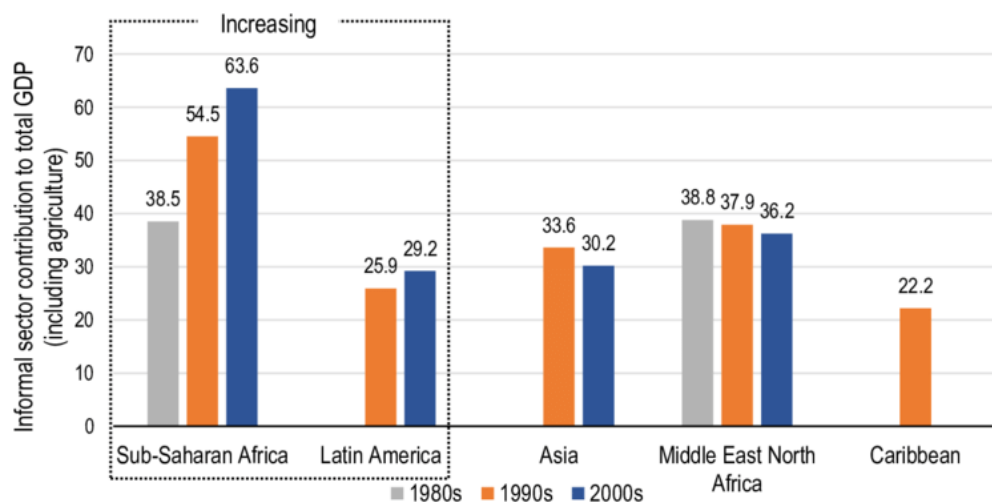
Inclusion of Women and Marginalized Communities:

The digital economy can promote social inclusion by creating employment opportunities for groups that face barriers in traditional labour markets. Women often experience limited mobility, unpaid care responsibilities, workplace discrimination, and restricted access to professional networks. Remote work, online businesses, freelancing, and digital education can allow women to earn income from home and participate in economic activities without facing some of the physical and social barriers associated with conventional workplaces. Digital platforms can also support persons with disabilities by reducing the need for daily travel and providing flexible working arrangements. Individuals with physical limitations may work as writers, designers, programmers, online teachers, consultants, or customer-support representatives. Assistive technologies such as screen readers, speech recognition systems, and accessible software can further improve their participation in digital employment. Rural communities can benefit because digital work reduces geographical isolation. People living far from major cities can access online training, job platforms, markets, and financial services. Rural entrepreneurs can sell agricultural products, handicrafts, clothing, and local services to wider markets. This access can reduce migration pressure and support local economic development. However, the digital economy may also increase inequality if access to technology is uneven. Low-income households may not be able to afford computers, smartphones, or high-speed internet. Women in some regions may have less access to mobile devices and digital education than men. Language barriers, low literacy levels, and concerns about online safety can also limit participation. Governments and development organizations should address these challenges through affordable internet programs, public computer centers, digital literacy campaigns, and financial support for devices. Training should be available in local languages and designed for different education levels. Strong policies against online harassment, discrimination, and digital fraud are also necessary. Inclusive digital policies can ensure that technological progress benefits unemployed and informal workers rather than increasing existing social inequalities.

Government Policies and Social Protection:

The effectiveness of the digital economy in reducing unemployment and informal labour depends greatly on government policy. Public investment in broadband networks, electricity, digital infrastructure, and education is necessary to ensure that individuals and businesses can participate in online economic activities. Without reliable internet access, the benefits of digital employment will remain concentrated in major cities and higher-income communities. Governments should also update labour laws to recognize new forms of employment. Traditional labour regulations are usually designed for permanent employees working in physical workplaces. Freelancers, delivery riders, online sellers, remote workers, and platform-based service providers may not fit these legal definitions. As a result, they may lack protection against unfair treatment, delayed payments, unsafe conditions, and sudden account suspension. Clear legal recognition can protect workers while allowing digital businesses to continue innovating. Social protection systems should be extended to self-employed and platform workers. Flexible contribution schemes can allow workers to access health insurance, pensions, maternity benefits, workplace injury coverage, and unemployment assistance. Digital platforms can assist by automatically collecting small social-security contributions from transactions. However, these systems must remain affordable so that workers are not discouraged from formal registration.

Tax policies should also be simple and fair. Excessive taxes or complicated reporting requirements may push small digital businesses back into informality. Governments can introduce simplified tax categories for freelancers, start-ups, and online sellers. Training and support should be provided to help them understand their responsibilities. Cooperation between governments, private companies, educational institutions, and worker organizations is essential. Private technology companies can provide training and employment platforms, while universities can prepare students for digital careers. Worker associations can represent the interests of freelancers and platform workers. Through coordinated policies, the digital economy can become a powerful instrument for creating employment, improving labour conditions, supporting entrepreneurship, and reducing informal economic activity. Its success ultimately depends on ensuring that technological progress is combined with inclusion, regulation, education, and social protection.



Source: Adapted from Charmes (2012)

Summary:

This article has argued that the digital economy holds significant promise for reducing both unemployment and the prevalence of informal labour in developing economies. By improving job-creation processes, enhancing labour-market matching via digital platforms, facilitating remote and flexible work, and making informal enterprises more visible and integrated into formal systems, digitalization presents a transformative opportunity. Empirical studies show that digital infrastructure and platforms contribute to employment growth and improved formalization. For example, research finds that the digital economy enhances efficient labour allocation, thereby reducing unemployment risk. This potential is not automatic. Key challenges include the digital divide (infrastructure, connectivity, and devices), skill mismatches, the risk of job-substitution through automation, and the possibility that digital labour remains informal or precarious. For instance, the ILO warns that digital labour platforms can perpetuate informal-like labour relations if unregulated. In the context of Pakistan, the informal labour market remains large and dynamic. The digital economy can provide pathways for formalization, yet this requires targeted investment in digital infrastructure, up-skilling of workers, inclusive policies that reach marginalized groups and regulatory frameworks that protect workers in new digital work arrangements. Policy recommendations include expanding broadband and mobile connectivity in underserved regions, providing digital-skills training especially for low- and middle-skilled workers, creating incentives for informal enterprises to adopt digital platforms and formal registration, designing social protection schemes adapted to platform and gig work, and ensuring gender and rural inclusivity in digital employment initiatives. While the digital economy is not a panacea, it offers a compelling instrument for employment policy in Pakistan and beyond. With strategic policy support and inclusive

implementation, digitalization can make significant contributions to reducing unemployment and shrinking the informal labour sector.

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