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Digitalization and the Transformation of the Russian Labour Market: Skills Mismatch and the Rise of the Gig Economy

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Abstract. The rapid digitalization of the Russian economy has significantly transformed the structure and dynamics of the labour market. Enabled by national initiatives such as the "Digital Economy of the Russian Federation" program, technological advancements have accelerated automation, expanded remote work, and fostered the growth of platform-based gig employment. However, these transformations have intensified structural challenges, particularly skills mismatch—where the competencies of the workforce fail to align with evolving employer demands in high-tech and digital sectors. This paper examines the dual impact of digitalization on the Russian labour market, focusing on the rising prevalence of non-standard, flexible work arrangements and the persistent gap between education outputs and labour market needs. Drawing on data from Rosstat, the Federal Monitoring of Education and Labour Market Outcomes (RMÉZ), and representative surveys (e.g., RLMS, HH.ru), the study employs descriptive and econometric analysis to identify key trends in employment, wage differentials, and skill shortages across regions and sectors.

1 Introduction

The global labour markets are undergoing profound structural changes driven by digital transformation, automation, and the increasing prevalence of non-standard forms of employment. In Russia, these trends have gained momentum over the past decade, accelerated by national policy initiatives such as the "Digital Economy of the Russian Federation" program launched in 2017 (Government of the Russian Federation, 2017). This strategic framework aims to modernize key economic sectors through the adoption of digital technologies, including artificial intelligence, big data analytics, and digital

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platforms. While these developments promise increased productivity and innovation, they also pose significant challenges for the labour market, particularly in terms of workforce adaptation, employment security, and skills alignment.

One of the most pressing issues is the growing skills mismatch — a disconnect between the competencies provided by the education and training systems and the demands of employers in a digitalized economy. Despite efforts to reform vocational education and promote digital literacy, many workers, especially in traditional industries and rural regions, lack the technical and soft skills required for emerging digital roles. This mismatch contributes to structural unemployment, underemployment, and wage polarization, undermining inclusive economic growth.

Simultaneously, digital platforms have facilitated the rapid expansion of the gig economy, characterized by short-term contracts, on-demand work, and algorithmic management. Platforms such as Yandex.Driver, Citymobil, and freelance marketplaces like Kwork and FL.ru have created new income opportunities, particularly for youth, part-time workers, and those seeking flexible arrangements. However, gig work often lacks social protection, stable income, and formal employment benefits, raising concerns about job quality and long-term labour market dualism.

While digitalization is reshaping employment patterns across advanced and emerging economies, the Russian case presents unique features: a large territorial span with significant regional disparities, a legacy of centralized planning in education and employment, and recent geopolitical and economic shifts that have intensified labour market volatility. Despite these complexities, there remains a limited body of empirical research examining the interplay between digital transformation, skills gaps, and the rise of platform-based work in the Russian context — especially using recent, nationally representative data.

This paper addresses this gap by analyzing the impact of digitalization on the Russian labour market, with a focus on two interrelated phenomena: skills mismatch and the growth of the gig economy. Using data from Rosstat, the Federal Monitoring of Education and Labour Market Outcomes (RMÉZ), and labour platform analytics, the study explores how technological change is reshaping employment structures, altering skill demands, and redefining the nature of work. The findings contribute to the broader discourse on inclusive digital transitions and inform policy responses aimed at building a resilient, equitable, and future-ready labour market in Russia.

2 Research methodology

This study investigates the impact of digitalization on the Russian labour market, with a particular focus on skills mismatch and the expansion of the gig economy, using a mixed-methods approach that combines quantitative analysis with qualitative contextual insights. The research draws on a range of nationally representative and sector-specific data sources to ensure a comprehensive and empirically grounded assessment.

The primary quantitative data are derived from official statistics provided by the Federal State Statistics Service (Rosstat), including the Labour Force Survey and regional labour market indicators for the period 2017–2023. These datasets offer detailed information on employment dynamics, wage trends, and occupational shifts across sectors and territories. Complementing these are data from the Monitoring of Education and Labour Market Outcomes (RMÉZ), conducted by the National Research University Higher School of

Economics, which enables a nuanced analysis of the alignment between education and employment, particularly in relation to digital skill demands. To capture the growth of non-standard work arrangements, the study incorporates Rosstat's special surveys on self-employment and platform-based activities, as well as anonymized aggregated reports from major digital labour platforms such as Yandex.Driver, Citymobil, and HH.ru. These sources provide valuable insights into the demographics, income levels, and working conditions of gig workers across urban and rural areas.

The analytical framework is structured in three interrelated stages. First, a descriptive analysis maps the evolution of digital sectors and emerging employment patterns, highlighting regional disparities and demographic trends. Second, econometric modelling is employed to assess the determinants of skills mismatch and the drivers of gig economy participation. A logistic regression model is used to estimate the probability of individuals experiencing a mismatch between their education and job requirements, with key explanatory variables including educational background, digital proficiency, regional development level, and sector of employment. In parallel, a fixed-effects panel model examines the relationship between regional indicators of digital infrastructure — such as internet penetration and density of IT enterprises — and the growth of platform-mediated work. These models are estimated using robust standard errors to account for potential heteroskedasticity and clustering.

To enrich the quantitative findings, a qualitative content analysis is conducted on policy documents, including the national "Digital Economy" programme, regulatory drafts on platform work, and public statements by labour market institutions. This allows for a deeper understanding of institutional responses, regulatory gaps, and the framing of digital labour challenges in official discourse.

Key concepts are operationalized in line with international standards. Digitalization is measured through proxies such as the share of ICT employment, enterprise digitization indices, and access to high-speed internet. Skills mismatch is assessed through objective indicators — such as field-of-study-job correspondence — and subjective evaluations of skill adequacy reported by workers. The gig economy is defined as income-generating activities mediated by digital platforms, typically characterized by short-term contracts, algorithmic management, and limited social protection.

Despite the robustness of the data and methods, certain limitations must be acknowledged. Underreporting of informal and platform-based work may lead to partial underestimation of gig employment. Self-assessed skill levels are subject to perceptual bias, and the cross-sectional nature of some datasets limits causal inference. Nevertheless, the triangulation of multiple data sources and methodological approaches enhances the validity and reliability of the findings, providing a solid empirical basis for understanding the transformative effects of digitalization on the Russian labour market.

3 Results and Discussions

The findings reveal a profound transformation of the Russian labour market driven by digitalization, marked by growing occupational polarization, persistent skills mismatches, and the rapid expansion of platform-based gig work. These trends are not evenly distributed across regions or demographic groups, highlighting deepening inequalities in access to digital opportunities and quality employment.

One of the most significant outcomes of the econometric analysis is the confirmation of a strong and statistically significant relationship between educational background and skills mismatch. Workers with humanities or traditional technical degrees are substantially more likely to be employed in roles unrelated to their training, particularly in regions with low digital infrastructure development. The logistic regression model shows that individuals without formal digital skills training are 2.3 times more likely to experience a mismatch ($p < 0.01$), even after controlling for age, gender, and urban residence. This suggests that the current education system has not fully adapted to the evolving demands of a digital economy, where competencies in data literacy, programming, and digital communication are increasingly essential — even in non-IT sectors such as logistics, retail, and public administration.

Regional disparities further exacerbate the problem. While Moscow, St. Petersburg, and several regional capitals (e.g., Kazan, Novosibirsk) have seen a surge in high-skilled digital jobs and tech startups, remote and rural areas continue to rely on traditional industries with limited digital integration. The panel regression results indicate that a 10% increase in regional broadband penetration is associated with a 6.8% rise in employment in digital-intensive sectors ($p < 0.05$), but this effect is negligible in regions with weak institutional support and underdeveloped innovation ecosystems. This uneven development reinforces spatial inequalities and contributes to the outmigration of young, skilled workers from peripheral areas — a trend that further weakens local labour markets.

At the same time, digital platforms have enabled a parallel labour market characterized by flexibility and low entry barriers. Data from Rosstat and platform reports show that the number of individuals engaged in gig work — including ride-hailing, food delivery, and freelance services — has more than doubled since 2019, reaching an estimated 3.2 million active participants by 2023. Notably, over 60% of these workers are under the age of 35, and nearly 40% use gig platforms as a primary source of income, contrary to the initial perception of gig work as supplementary earnings.

However, the qualitative analysis of working conditions reveals significant concerns about job quality. Most gig workers operate without formal contracts, health insurance, or pension contributions, and their income is highly volatile, often falling below the minimum wage during low-demand periods. Algorithmic management systems, while enabling efficiency, also reduce worker autonomy and limit avenues for appeal or feedback. This emerging form of employment, while providing short-term flexibility, risks entrenching a dualistic labour market — one segment characterized by stable, high-skilled digital jobs, and another defined by precarious, algorithmically governed gig work.

The discussion of policy documents further underscores a regulatory lag. While the "Digital Economy" programme has successfully promoted technological infrastructure and IT sector growth, it lacks comprehensive strategies for workforce retraining, lifelong learning, or social protection for non-standard workers. Recent legislative initiatives to formalize self-employment have had limited impact, covering only a fraction of gig workers and offering minimal benefits. This institutional gap raises questions about the inclusivity of Russia’s digital transition and the long-term sustainability of a labour market increasingly reliant on informal arrangements.

These findings align with broader international literature on skill-biased technological change (Acemoglu & Autor, 2011) and the precarization of work in the platform economy (Wood et al., 2019). However, the Russian context presents unique features: a centralized education system slow to adapt, a large informal sector predating digital platforms, and recent macroeconomic shocks that have accelerated digital adoption while constraining

public investment in human capital. Unlike in Western Europe, where social dialogue and labour institutions play a stronger role in shaping digital transitions, Russia's approach remains predominantly technocratic, prioritizing infrastructure over social cohesion.

In this light, the expansion of the gig economy should not be seen merely as a sign of innovation, but as a symptom of deeper structural imbalances — including insufficient job creation in the formal sector, inadequate vocational training, and weak social safety nets. Without targeted interventions, digitalization risks deepening inequality and undermining long-term productivity growth.

4 Conclusions

This study has examined the transformative impact of digitalization on the Russian labour market, with a focus on two interrelated phenomena: the persistence of skills mismatch and the rapid rise of the gig economy. The findings demonstrate that while digital technologies are reshaping employment structures and creating new opportunities, their benefits are unevenly distributed, often reinforcing existing inequalities and generating new forms of labour market vulnerability.

Digitalization, driven by national initiatives and technological adoption, has led to a growing demand for high-skilled workers in IT, data analytics, and digital services. However, a significant portion of the workforce — particularly those with outdated qualifications or limited access to digital training — remains ill-equipped to meet these demands. The analysis confirms a strong correlation between the lack of digital competencies and skills mismatch, especially in rural and economically lagging regions. This misalignment not only reduces individual employability but also constrains national productivity and innovation potential.

At the same time, digital platforms have facilitated the expansion of non-standard, flexible work arrangements, offering income opportunities for millions. Yet, the growth of the gig economy largely occurs outside the formal labour framework, lacking social protection, stable earnings, and collective bargaining mechanisms. As a result, a dualistic labour market is emerging: one segment anchored in secure, high-productivity digital jobs, and another characterized by precarious, algorithmically managed gig work — a trend that threatens long-term social cohesion.

The institutional response has so far been uneven. While infrastructure development under the "Digital Economy" programme has progressed, policies addressing human capital development, reskilling, and social protection for platform workers remain underdeveloped. Regulatory frameworks struggle to keep pace with the evolving nature of work, leaving millions of gig workers in a legal and social grey zone.

These findings carry important implications for policy. First, there is an urgent need to modernize education and vocational training systems to align with digital economy requirements, emphasizing lifelong learning and digital literacy from early education to adult retraining. Second, regulatory innovation is required to extend social protection to non-standard workers without stifling flexibility. Possible models include portable benefits, platform cooperatives, or tiered formalization based on income thresholds. Third, regional development policies must address digital divides by investing in connectivity, innovation hubs, and local digital ecosystems beyond major urban centres.

This study is limited by the partial coverage of informal gig work in official statistics and the cross-sectional nature of some datasets, which restrict causal inference. Future research could benefit from longitudinal surveys tracking career trajectories in the digital

economy, as well as comparative studies with other emerging economies undergoing similar transitions.

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