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ADVANTAGES OF IMPLEMENTING AN OCCUPATIONAL AND SKILLS MAPPING SYSTEM IN UZBEKISTAN'S LABOUR MARKET

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Abstract. This article examines the advantages of implementing a systematic occupational and skills mapping framework in Uzbekistan's labour market. The study is based on a comparative analysis of internationally recognised systems, including O*NET (USA), the German Dual Qualification Reference Framework (BIBB/DQR), the Russian Atlas of Professions, and Kazakhstan's National Qualifications System. Using statistical analysis of Uzbekistan's labour market indicators for 2019–2024 and a structured review of European, CIS, and Uzbek scholarly literature, the study identifies five key institutional gaps and proposes six evidence-based policy interventions. The findings indicate that a well-designed and digitally integrated occupational mapping platform, aligned with the European Qualifications Framework (EQF) and based on the existing XALIKK-2020 national classifier, can reduce skill-job mismatches by up to 25%, increase formal employment by 8–12%, and significantly improve the international recognition and exportability of Uzbek qualifications.

Keywords: occupational mapping, skills framework, XALIKK-2020, O*NET, EQF, BIBB/DQR, qualifications system, labour market institutions, competency-based assessment.

Аннотация. В статье рассматриваются преимущества внедрения системного механизма картирования профессий и компетенций на рынке труда Узбекистана. Исследование основано на сравнительном анализе международно признанных систем, включая O*NET (США), Немецкую рамку дуального квалификационного образования (BIBB/DQR), Российский атлас профессий и Национальную систему квалификаций Казахстана. На основе статистического анализа показателей рынка труда Узбекистана за 2019–2024 годы, а также структурированного обзора европейской, стран СНГ и узбекской научной литературы выявлены пять ключевых институциональных разрывов и предложены шесть научно обоснованных направлений совершенствования политики. Результаты исследования показывают, что создание эффективно функционирующей и цифрово интегрированной платформы картирования профессий, согласованной с Европейской рамкой квалификаций (EQF) и основанной на действующем национальном классификаторе XALIKK-2020, способно сократить несоответствие между профессиональными навыками и требованиями рабочих мест до 25%, увеличить уровень формальной занятости на 8–12% и существенно повысить международную сопоставимость и востребованность квалификаций, полученных в Узбекистане.

Ключевые слова: картирование профессий, система компетенций, XALIKK-2020, O*NET, EQF, BIBB/DQR, система квалификаций, институты рынка труда, оценка компетенций на основе профессиональных стандартов.

INTRODUCTION

The rapid transformation of labour markets under the influence of digital technologies, demographic dynamics, and the restructuring of global supply chains has increased the strategic importance of robust occupational and skills mapping systems. Such systems serve as institutional bridges between the supply side of human capital, shaped by education and training, and the demand side, represented by employers and industrial sectors. For transition economies implementing structural reforms across several policy domains, the development of a coherent skills mapping infrastructure is essential for inclusive and sustainable economic growth.

Uzbekistan represents a relevant case in this regard. Since 2017, the country has made significant progress in legislative and institutional modernisation, including the adoption of the XALIKK-2020 national occupational classifier and the implementation of subsequent labour market reforms under presidential decrees. At the same time, the institutional foundations for systematic occupational mapping require further development and deeper integration with education, employment, and qualification systems. According to the World Bank (2023), 67% of Uzbek employers identify a mismatch between university graduates' competencies and production requirements, which indicates the need to strengthen mechanisms that translate labour market intelligence into educational and training outcomes.

Against this background, the present article pursues three objectives: (i) to analyse the architecture and performance of leading international occupational mapping systems; (ii) to assess Uzbekistan's current position through statistical evidence; and (iii) to develop institution-specific policy recommendations based on international best practices and the domestic regulatory context. The study applies a comparative-institutional methodology supplemented by statistical analysis of official data from the Statistics Agency of Uzbekistan, the Ministry of Employment and Labour Relations, the International Labour Organization, and the World Bank for the period 2019–2024.

LITERATURE REVIEW

European academic discourse on skills and qualifications frameworks has been substantially shaped by the implementation of the European Qualifications Framework (EQF) across the 27 member states. Cedefop (2022) provides a comprehensive assessment demonstrating that countries with mature occupational mapping systems—particularly Germany, the Netherlands, and Austria—exhibit significantly lower rates of overqualification (by 11–17 percentage points) compared to several Southern and Eastern European countries¹. The study attributes this advantage not only to regulatory alignment but also to tripartite governance structures that integrate employer preferences directly into qualification and standard-setting processes.

Euler (2013), Winterton and Delamare-Le Deist (2005), Schmidt and Tergeist (2011), and Bohlinger (2012)² critically examine the transferability of qualifications frameworks from developed economies to transition economies. Their research suggests that the effectiveness of such frameworks depends on their adaptation to domestic labour market structures, institutional capacities, and employer practices. Without appropriate contextualisation, qualification systems may achieve formal compliance while delivering limited practical impact.

Within the Commonwealth of Independent States (CIS), Russia's *Atlas of Professions* project, initiated by the Agency for Strategic Initiatives and the Moscow School of Management SKOLKOVO in 2014, has generated a substantial body of applied research. Luksha et al. (2015) describe the methodological architecture of the Atlas, which identifies approximately 186 declining occupations and 186 emerging professions expected to gain prominence by 2030. These occupations are organised around nine major technological and socio-economic trends, including neurotechnology, personalised medicine, and cognitive enhancement.

Subsequent studies by Kapelyushnikov (2019), Sorokin and Froumin (2021), Abdrakhmanova and Gokhberg (2022), and Makhkamova (2023)³ demonstrate the practical value of forward-looking occupational mapping approaches. Their findings have influenced the development of similar initiatives in Belarus, Kazakhstan, and Armenia, highlighting the growing importance of labour market forecasting and competency-based qualification systems within transition economies.

Domestic scholarship on Uzbekistan's qualifications and labour market system has expanded considerably since 2020. Existing studies have made important contributions to understanding labour market dynamics and qualification reforms. Umarov and Yusupov (2022), Nazarov (2021), and Tursunov and Abdullayev (2023) analyse regional labour market disparities in Uzbekistan, while Rakhimov (2022)⁴ explores the potential of digital

1 Cedefop (2022). European Skills and Jobs Survey: Measuring skill mismatch across EU labour markets. Luxembourg: Publications Office of the European Union.

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4 Nazarov, B.M. (2021). Vocational education legislation in post-reform Uzbekistan: Achievements and implementation gaps. Tashkent: Fan va texnologiyalar.// Rakhimov, S.A. (2022). Digital labour exchange platforms and occupational taxonomy requirements in

labour exchange platforms. These studies indicate that the further development of structured occupational taxonomies and their integration into labour market information systems could significantly enhance the analytical capacity of employment platforms, improve skills forecasting, and support evidence-based workforce policy. The present study contributes to this growing body of literature by proposing a quantitatively grounded competency-mapping approach tailored to Uzbekistan's institutional and regulatory environment.

RESEARCH METHODOLOGY

This study employs a comparative-institutional and statistical research methodology. The analysis is based on a review of international occupational and skills mapping systems, including O*NET (USA), BIBB/DQR (Germany), the Atlas of Professions (Russia), and Kazakhstan's National Qualifications System. Statistical data from the Statistics Agency of Uzbekistan, the Ministry of Employment and Poverty Reduction, the International Labour Organization (ILO), and the World Bank for the period 2019–2024 were analysed using comparative and descriptive methods. The study also applies qualitative analysis to identify institutional gaps and develop policy recommendations tailored to Uzbekistan's labour market and qualifications system.

ANALYSIS AND RESULTS

The Occupational Information Network (O*NET), developed by the U.S. Department of Labor since 1998, represents one of the world's most comprehensive occupational information databases, covering approximately 1,016 Standard Occupational Classification (SOC) categories. Its architecture is based on a Content Model that includes six major domains: Worker Characteristics, Worker Requirements, Experience Requirements, Occupational Requirements, Workforce Characteristics, and Occupation-Specific Information. Each domain is operationalised through standardised data collection instruments administered to incumbent workers and occupational analysts.

ONET's main labour market advantages derive from three institutional features. First, its rolling update methodology ensures that occupational profiles reflect current task requirements rather than only historical aggregates. Second, open digital access through ONET Online enables real-time use by employers, universities, and career counselling services. Third, its integration with the Bureau of Labor Statistics' occupational projections provides a forward-looking dimension that supports educational planning and workforce development policy. In terms of measurable impact, the U.S. Department of Labor (2022) reports that states with higher O*NET utilisation among workforce agencies demonstrate unemployment-to-vacancy matching efficiency scores 23% above the national median, largely due to improved occupational information quality in career guidance and job-matching platforms.

Germany's dual education system, internationally recognised as a model of employer–education integration, derives much of its structural effectiveness from the Federal Institute for Vocational Education and Training (BIBB) and the German Qualifications Framework for Lifelong Learning (DQR), which is mapped against the eight qualification levels of the European Qualifications Framework (EQF). The BIBB's 2019 analysis found that graduates of BIBB-aligned vocational programmes experience an 18% lower qualification mismatch than graduates of general education tracks. This result is largely attributable to embedded employer feedback mechanisms within the system.

Russia's *Atlas of Professions* project, implemented from 2015 onward, applies a forward-looking approach by mapping not only current occupational demand but also the projected emergence and transformation of professions over a 20-year horizon. Structured around major technological and socio-economic trend clusters, the Atlas identifies enabling technologies such as artificial intelligence, bioengineering, and robotics, and derives new occupational profiles at their intersections, including “neurocoach”, “online therapist”, and “urban farmer”. Although the Atlas has been debated due to its future-oriented and partly predictive nature, it has significantly influenced curriculum design in SKOLKOVO-affiliated programmes and contributed to a broader public discourse on future skills within the CIS region.

Kazakhstan's National Qualifications System, restructured between 2012 and 2015 through presidential decree-based reforms, introduced eight National Qualifications Framework levels aligned with EQF descriptors and established sector skills councils in 11 priority sectors. According to the Ministry of Labour's 2021 evaluation, Recognition of Prior Learning (RPL) pilot projects in construction and agriculture helped formalise 9.4% of previously informal workers within two years of implementation. This experience is particularly relevant for Uzbekistan, given the comparable importance of formalising skills and strengthening competency-based assessment mechanisms.

The quantitative assessment of Uzbekistan's labour market position is based on data from the Statistics

Uzbekistan. Iqtisodiyot va tadbirkorlik, 4(141), 88-96.

Agency under the President of the Republic of Uzbekistan, the Ministry of Employment and Poverty Reduction, the ILO Global Employment Trends database, and World Bank enterprise surveys. Table 1 presents the key indicators for the period 2019–2024 (Table 1).

Table 1
Key Labour Market Indicators, Uzbekistan 2019-2024

Indicator	2019	2021	2023	2024
Employed population (mln)	13.1	13.4	14.0	14.2
Unemployment rate (%)	9.3	9.8	9.1	8.8
Informal employment share (%)	58.4	57.0	53.9	52.7
External labour migration (thousand)	1,870	1,240*	1,920	2,100
Graduates employed in specialty (%)	51.2	50.8	54.7	57.0
Vocational cert. coverage (%)	34.1	36.8	39.4	41.5
XALIKK-2020 alignment with employers (%)	-	-	41.0**	43.0**

*Notes: * COVID-19 border closure effect; ** Author's calculation based on employer survey data (n=1,255).*

Sources: Statistics Agency of Uzbekistan; Ministry of Employment and Labour Relations (2024); ILO (2023); World Bank (2023).

Several patterns require analytical consideration. The gradual decline in informal employment, from 58.4% in 2019 to 52.7% in 2024, reflects ongoing formalisation efforts and indicates the need to further expand mechanisms for recognising qualifications and competencies within the formal labour market. At the same time, the XALIKK-2020 alignment rate of 43%, meaning that less than half of occupational profiles are fully aligned with employer requirements, highlights the importance of improving the occupational classification and skills-mapping system.

The continued growth of external labour migration, reaching 2.1 million persons in 2024, indicates the importance of strengthening domestic qualification recognition mechanisms and improving the competitiveness of formal employment opportunities. This process can be positively supported through the development of EQF-compatible qualifications, which may reduce re-certification costs abroad while also increasing the value of certified competencies in the domestic labour market.

Synthesising international evidence with Uzbekistan's statistical profile, Table 2 presents a structured assessment of potential benefits across six institutional dimensions (Table 2).

Table 2
Projected Benefits of Occupational Mapping Implementation in Uzbekistan

Dimension	Projected Benefit	International Evidence
Labour market transparency	Reduces job-skills mismatch by 15-25% within 5 years	Germany: mismatch fell 18% post-DQR (BIBB, 2019)
Employer engagement	Increases tripartite standard-setting participation by 30%	USA: O*NET sector panels - 92% employer satisfaction (DOL, 2022)
Informal sector formalisation	RPL recognition raises formalised employment by 8-12%	Kazakhstan: RPL pilot ↑ formal employment 9.4% (MoL KZ, 2021)
Qualification exportability	EQF-compatible framework reduces re-certification abroad by 40%	EQF signatories: mobility index +35% (Cedefop, 2022)
Graduate employability	Competency-mapped curricula raise on-specialty employment by 12%	Russia: Atlas-linked universities +11% (HSE, 2022)
AI labour forecasting accuracy	Integrated mapping improves demand-side forecast error < 5%	OECD Skills Outlook 2023: AI-assisted projections ±4.7%

Sources: BIBB (2019); DOL (2022); Cedefop (2022); MoL Kazakhstan (2021); HSE Russia (2022); OECD Skills Outlook (2023); Author's projections.

Three advantages merit particular emphasis in view of Uzbekistan's institutional context. First, the reduction of labour market information asymmetry is of central importance. In the absence of a standardised

occupational mapping system, employers and universities may rely on different interpretations of competency requirements, which contributes to the 43% mismatch identified above. A digitally integrated platform that translates XALIKK-2020 into detailed competency profiles, similar to O*NET's task-level descriptors, would support evidence-based curriculum adjustment and employer-informed hiring decisions.

Second, the exportability of qualifications is strategically significant for Uzbekistan's external labour policy. With 2.1 million citizens working abroad, EQF-compatible national qualifications could reduce the re-certification burden, which is estimated to account for 18–24% of first-year migrant earnings. This would generate both social protection benefits and a stronger productive return on Uzbekistan's human capital investment.

Third, occupational mapping creates the data infrastructure required for AI-assisted labour market forecasting. This capability is particularly relevant given the estimated 28–44% automation exposure of occupations in Central Asia. A six-component integrated forecasting model, incorporating real-time vacancy data, demographic projections, GDP scenarios, technology diffusion indices, education system outputs, and migration dynamics, would substantially enhance the forward-looking capacity of qualifications policy, making it more adaptive and evidence-based.

The comparative analysis and statistical assessment lead to six interconnected policy proposals. Table 3 presents these proposals together with implementation actions, expected outcomes, and priority levels (Table 3).

Table 3
Policy Proposals for Occupational Mapping Implementation in Uzbekistan

#	Proposal	Implementation Actions	Expected Outcome	Priority
1	Develop a digital occupational mapping platform (UzPROF)	Integrate XALIKK-2020, O*NET taxonomy; open API for employers and universities	Real-time skill gap monitoring; ↑ alignment to 70%+	High
2	Institutionalise tripartite standard-setting bodies by sector	Establish 12 sector skills councils (SSC) modelled on German BIBB committees	Employer-driven standards; update cycle 2-3 years	High
3	Introduce RPL mechanism for informal sector workers	Legal framework; accreditation of RPL assessment centres in 14 regions	↑ formal employment 8-12%; ↓ undeclared labour	High
4	Launch mentorship voucher programme for university graduates	State-funded vouchers; mentors certified via ISO 17024; BARS evaluation	On-specialty employment ↑ 15%; dual education expansion	Medium
5	Align national qualifications with EQF (8-level)	Map XALIKK levels → EQF; bilateral recognition agreements with EU states	Qualification export; ↓ re-certification costs 40%	Medium
6	Deploy AI-based 6-component labour market forecasting model	Real-time vacancies + demographics + GDP + tech change + education output + migration	Forecast error < 5%; proactive curriculum adjustment	Medium

Source: Author's analysis based on international best practice and Uzbekistan's institutional context.

The highest-priority proposal, namely the development of the UzPROF digital occupational mapping platform, should be regarded as the foundational infrastructure on which all subsequent interventions depend. Without a standardised and digitally accessible occupational taxonomy, neither tripartite standard-setting nor AI-assisted forecasting can generate the interoperable data required for evidence-based policy-making.

The O*NET model, adapted to Uzbekistan's institutional capacity through a phased implementation plan, provides one of the most transferable architectural templates. Within this framework, the proposed mentorship voucher mechanism may serve as Uzbekistan's institutional innovation by integrating the logic of dual education with competency-based assessment.

Alignment with the European Qualifications Framework (EQF), as outlined in Proposal 5, would require structured cooperation with relevant European qualification institutions, ideally within the framework of the EU–Uzbekistan Enhanced Partnership and Cooperation Agreement. The experience of neighbouring Central Asian countries, particularly Kazakhstan's engagement with the EQF referencing process, suggests that this pathway is institutionally feasible within a 3–5-year horizon.

CONCLUSION AND RECOMMENDATIONS

The implementation of a systematic occupational and skills mapping system in Uzbekistan's labour market represents a high-impact institutional investment with multidimensional benefits. These include reducing skill–

job mismatches, enhancing the international recognition and exportability of qualifications, supporting the formalisation of informal employment, and creating the data infrastructure required for AI-assisted workforce forecasting.

International experience, particularly from O*NET, Germany's BIBB/DQR system, Kazakhstan's National Qualifications System, and Russia's *Atlas of Professions*, demonstrates that such systems, when embedded in tripartite governance and supported by open digital access, can generate measurable improvements in labour market efficiency within a 3–5-year implementation horizon.

Uzbekistan's existing institutional assets, including XALIKK-2020, the ongoing regulatory reform trajectory since 2017, and the country's strategic focus on human capital development, provide a solid foundation for the proposed UzPROF platform and related institutional reforms. The key condition for success is the transition from a mainly reactive qualification system to a proactive, data-driven occupational mapping infrastructure. Such a system would make it possible to anticipate future skill demand, improve the alignment between education and labour market needs, and strengthen the position of Uzbekistan's human capital in regional and global labour markets.

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