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Review Article

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Conceptual Theory of the Dynamics of Occupational Change (Switching) and Employment of Workers in the Modern World

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ABSTRACT

Relevance: The study is motivated by the dynamics of the modern labour market, subject to the multi-faceted influence of technological progress, automation, artificial intelligence (AI), and globalisation.

Object: The study focuses on categories of workers whose employment stability is threatened by structural economic changes.

Aim: The paper develops a new classification system based on the author's Theory of Professional Worker Relativity, categorising specialists according to their degree of vulnerability to displacement.

Methods: The research methods encompass analysis of economic theory, structural approaches in human resource management, and practical cases of employment transformation.

Results: The findings are presented as a risk-assessment system for professional obsolescence and adaptation strategies, including continuous learning, soft-skill development, and strengthened social protections.

Keywords: Unemployment, Structural Unemployment, Frictional Unemployment, Technological Unemployment, Automation, Artificial Intelligence, Retraining, Labour Market, Talent Management, Digital Transformation, Sustainable Employment, Soft Skills, Adaptability, Social Protections

Introduction

In the contemporary world, scientific and technological progress is accelerating at an ever-increasing pace, fundamentally transforming the labour market. Automation, the rapid development of artificial intelligence (AI), intensifying globalisation, and ubiquitous digital transformation are reshaping the employment landscape, creating new opportunities for some categories of workers while posing serious threats to others. In an environment of growing uncertainty, it becomes critically important to understand the mechanisms underlying these developments and to devise effective adaptation strategies.

This article develops the proposed theoretical model by offering a detailed analysis of various categories of professional workers, identifying the key factors determining their susceptibility to unemployment, and providing practical recommendations for securing sustainable employment in an era of transformation. The concept of the 'relativity' of professional workers represents a novel approach to understanding and addressing the complex problems of economic labour security in the context of the current pace of technological progress.

Literature Review

The contemporary scholarly debate on the future of work and employment is structured around several key themes that underpin the present study.

A foundational analysis of the relationship between technological progress and the labour market is provided by Acemoglu and Restrepo [1,2]. Their task-based approach demonstrates that automation displaces human labour from certain routine tasks while simultaneously creating new tasks and occupations, which determines the overall impact on employment and income inequality. Brynjolfsson and McAfee argue that in the

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'second machine age' digital technologies are transforming not only manual but also cognitive labour, posing a threat to the middle class [3]. Within the Russian context, the trends of the AI economy and its impact on labour security are examined by Volovik [4].

The seminal empirical study by Frey and Osborne laid the groundwork for assessing the probability of computerisation across hundreds of occupations through task-based analysis [5]. Their finding that nearly half of all US jobs face high vulnerability became the starting point for numerous subsequent studies adapting this methodology to different countries. Ford extends this inquiry, examining the broader social and economic consequences of mass technological unemployment [6]. Research into disappearing professions in Russia is conducted, for example, by Kazantseva and Lobacheva [7].

In response to these technological challenges, human resource management theory has developed the concept of strategic talent management, focusing on attracting, developing, and retaining key 'irreplaceable' specialists [8]. In parallel, adaptation instruments such as job rotation — which facilitates skill development and reduces professional burnout — have been investigated [9, 10]. Drucker identifies the need for continuous self-renewal and knowledge acquisition as the principal management challenge of the twenty-first century [11]. The importance of lifelong learning and early investment in human capital is also underlined by Heckman [12].

Classical economic theory frames these processes through the lens of structural and frictional unemployment [13]. However, analysing the deep mechanisms of the transformation of labour functions and occupational 'switching' requires a theoretical framework capable of describing interdependencies within the production system. Such a framework is provided by the theory of Piero Sraffa [14,15]. Its central proposition concerning the interdependence of production processes and the determining role of 'physical conditions of production' (real costs and technologies) permits occupations to be viewed as analogues of such processes, and changes in employment as transitions from one 'technological' process to another, requiring a change in the set of 'inputs' (skills and competencies).

Identified Gap and Novelty of the Research. Despite an extensive body of literature, two key gaps can be identified. First, existing classifications focus predominantly on the risk of technical substitution, giving insufficient attention to the risks of professional skills obsolescence (PSPR), human competition (PSHR), and the role of unique competencies (PNSR) [5]. Second, analytical approaches to labour market policy (see, e.g., Bauer et al., 2018 and theoretical models of economic dynamics often coexist in parallel without operational connection [16,17].

The present study aims to fill these gaps. Its scientific novelty lies in the following contributions:

- Development of an integral five-category model of worker vulnerability, integrating technological, social, and economic mechanisms of displacement.
- Synthesis of this model with P. Sraffa's production theory, enabling the conceptualisation of occupational transitions as 'switching' between interdependent production processes within the labour market system.
- Formulation of differentiated adaptation strategies for each category of worker, derived from the proposed classification and theoretical analysis.

The study is thus positioned not merely as a classificatory work but also as a methodological contribution, offering a new conceptual instrument for analysing employment dynamics under conditions of non-linear technological progress.

Extended Classification of Professional Workers By Degree of Susceptibility to Displacement

For a more detailed understanding of current processes, the proposed theoretical model divides workers into five categories, each characterised by a unique set of challenges associated with different forms of professional displacement (Table 1).

Table 1: Relative Categories of Workers

Category (Acronym)	Definition	Profession Examples	Key Change Drivers	Theoretical Basis
PSPR (Person Subject to Professional Retraining)	Professionals whose occupations have become obsolete due to technological/social changes	Telegraph operators, chimney sweeps, coal miners	Technological progress, industrial decline, regional economic shifts	Theory of structural unemployment
PSTR (Person Subject to Technical Replacement)	Professionals performing routine tasks susceptible to automation	Taxi drivers, machine operators, cashiers	Automation of repetitive tasks, economic efficiency of machines	Sraffa's production theory; Professional structural unemployment
PSNR (Person Subject to Neural Network Replacement)	Professionals in data processing and creative fields vulnerable to AI	Junior lawyers, copywriters, accountants	AI capacity to process information, generate content, analyse data	Digital structural unemployment; AI theory
PSHR (Person Subject to Human Replacement)	Highly qualified professionals who may be displaced by more skilled competitors	Engineers, project managers, mid-level accountants	Globalisation, online education, employer preference for top talent Frictional unemployment; Talent competition	Frictional unemployment; Talent competition

PNSR (Person Not Subject to Replacement)	Professionals with unique skills (creativity, leadership, specialist expertise)	Neurosurgeons, innovative architects, artists, etc.	Unique professional qualities	Talent management; Knowledge economy

PSPR (Person Subject to Professional Retraining): Specialist whose occupation has become obsolete as a result of technological change

This category encompasses occupations for which demand has declined or that have become functionally redundant due to the introduction of new technologies, shifts in societal preferences, or the emergence of more efficient alternatives. In addition to traditional examples, such as chimney sweeps and lamplighters, this category includes telegraph operators and telephone switchboard operators, whose functions have all but disappeared with the development of modern communications. The theoretical foundation for this category is the concept of structural unemployment. The obsolescence of such occupations is frequently associated with territorial structural unemployment, where declining industries are concentrated in specific regions, complicating retraining and re-employment. For example, the closure of coal mines in particular areas leads to mass unemployment among miners and support personnel, necessitating comprehensive retraining programmes and economic diversification strategies.

PSTR (Person Subject to Technical Replacement): Specialist whose functions may be replaced by automated systems

This group encompasses occupations involving the performance of routine or repetitive tasks that can be effectively executed by automated systems. Particularly vulnerable are occupations such as taxi drivers, milling and stamping machine operators, and cleaners. Contemporary examples include the replacement of lorry drivers by autonomous vehicles and supermarket cashiers by self-checkout systems. Analysis of this category draws on the work of Piero Sraffa [7] and the concept of professional structural unemployment, which arises when the introduction of new technologies requires a different set of skills and competencies [15,18]. For instance, automated production lines reduce the demand for machine operators, requiring them to acquire skills in operating robotic equipment.

PSNR (Person Subject to Neural Network Replacement): Specialist whose occupation is susceptible to replacement by artificial intelligence systems

This category includes occupations centred on information processing, data analysis, content creation, and decision-making, which are vulnerable to AI-driven automation. Examples include reporting managers, accountants, statisticians, and copywriters [6]. Junior lawyers engaged in case-law analysis may be effectively replaced by AI systems capable of performing these tasks more rapidly and accurately. The emergence of PSNR marks a new era of digital structural unemployment, characterised by the mass displacement of human labour by algorithms [16, 19, 20]. The development of generative AI, such as ChatGPT, poses a threat to copywriters, content managers, and even journalists, as AI becomes increasingly capable of generating diverse textual material across varying levels of complexity [4].

PSHR (Person Subject to Human Replacement): Specialist who may be replaced by another specialist with higher qualifications

This group comprises occupations requiring a high degree of specialisation but lacking a unique combination of skills, making them vulnerable to competition from other qualified professionals. Examples include engineers, project managers, accountants, and construction workers [9,10]. In conditions of globalisation and the widespread availability of online education, competition among specialists is intensifying. Employers seek to hire the most highly qualified candidates, increasing the risk of frictional unemployment for this category — that is, the time required to find new employment commensurate with their qualifications. A junior engineer without significant practical experience may encounter difficulties in securing employment even with a prestigious degree. Therefore, developing a personal brand, continuously acquiring relevant skills, completing internships, participating in professional conferences, and obtaining certifications can significantly enhance employment prospects for PSHR workers.

PNSR (Person Not Subject to Replacement): Irreplaceable specialist with unique competencies

This category includes professionals who possess unique knowledge, skills, and experience that are extremely difficult to replicate through automated systems or to replace with other individuals [11]. Examples include senior executives of major corporations, experienced architects, innovative design engineers, highly qualified surgeons, and accomplished artists [8]. Resilience to unemployment in this category is ensured by a combination of exceptional expertise, creativity, critical thinking, leadership qualities, and the capacity to adapt to change. An experienced surgeon who has mastered unique techniques and can make decisions in emergency situations is unlikely to be replaced by a robot in the near future. Equally, creative architects who produce innovative and functional designs that account for the specific needs of clients will remain in demand despite advances in automated design systems. It should be noted that, within this category, one should not anchor to particular job titles or hierarchical levels within an organisation's corporate structure, as classification as PNSR is determined by the professional capabilities of the individual worker.

Unemployment Risks And Determining Factors

Assessment of unemployment risk requires consideration of numerous interrelated factors that influence the vulnerability of different categories of workers. The pace and scale of technological progress play a key role: the speed of advancement in automation, AI, and other technologies directly threatens employment stability, especially for specialists whose functions are susceptible to automation [21].

Structural economic changes and globalisation also exert considerable influence. The transformation of economies and intensifying globalisation lead to the rapid obsolescence of entire professional sectors while simultaneously generating demand

for new skills [21]. Digital inequality exacerbates this situation: unequal access to digital technologies and educational resources widens the gap between workers, depriving many of the ability to adapt and increasing their vulnerability.

The quality and currency of education and professional training are critically important, since they determine workers' ability to meet the changing demands of the labour market. The development of soft skills — such as communication, creative thinking, and emotional intelligence — gives workers an advantage over automated systems and enhances their resilience to displacement [13].

Finally, government support and social protections play a key role in mitigating the negative consequences of technological change. Effective social protection systems, including retraining programmes, can significantly reduce the risks of unemployment.

Addressing the rapidly changing labour market requires a comprehensive and proactive set of strategies aimed at securing sustainable employment and reducing professional risks.

The Principle of Continuous Learning lies at the heart of any effective adaptation strategy. The concept of lifelong learning implies the continuous updating of knowledge and skills throughout a professional career, enabling workers to remain relevant in the face of technological change.

Development of Soft Skills and Digital Literacy also plays a crucial role. Alongside technical competencies, skills such as communication, complex problem-solving, creative thinking, and emotional intelligence become critically important. Simultaneously, levels of digital literacy must be raised so that workers can make effective use of modern technologies in their professional activities.

Strengthening Education–Business Partnerships is another essential dimension. Close collaboration between educational institutions and industry stakeholders enables educational programmes to be aligned with the actual needs of the labour market, equipping graduates with current knowledge and practical skills.

Supporting Entrepreneurship and Innovation promotes the creation of new jobs and the emergence of promising economic sectors. Developing a favourable ecosystem for start-ups and technology companies stimulates economic dynamism and helps to cushion the effects of automation.

Strengthening Social Protection Systems is necessary to safeguard workers during periods of transformation. Effective support measures should include targeted unemployment benefits, retraining programmes, and employment assistance, thereby reducing the social costs of structural economic change.

Modernising Labour Legislation is the final element of the strategy. Legal norms must be adapted to the new realities of digitalisation and AI implementation in order to strike a balance between protecting workers' rights and stimulating innovative development.

This multi-layered approach makes it possible to minimise unemployment risks and to create the conditions for the sustainable long-term development of the labour market.

Occupational Switching in the Contemporary Labour Market

Piero Sraffa's production theory, originally developed for analysing the functioning of economic systems as a whole, constitutes a powerful instrument for understanding the complex processes occurring in the labour market. Its central idea is that prices and output volumes in an economy are determined by an interrelated system of production processes. This idea can be extrapolated to the labour market, where occupations may be regarded as a form of 'production processes' employing certain 'means of production' — skills, knowledge, and experience — to generate a 'product', namely the work performed and the added value created [14].

In the context of technological progress, when certain 'production processes' (occupations) become less efficient or, in extreme cases, fully obsolete and lose their relevance, workers previously engaged in these fields find themselves compelled to switch to other, more promising 'production processes'. The nature of this transition may vary: it can be relatively smooth and painless if the skills and knowledge required for the new occupation are sufficiently close to those already possessed by the worker. However, where the technological gap between the obsolete and the new occupation is substantial, workers require significant retraining, upskilling, and adaptation to new demands.

In his writings, Sraffa emphasised particularly the importance of accounting for what he called 'physical conditions of production'. Applied to the labour market, this means that real account must be taken of the actual skills, knowledge, and experience possessed by workers, as well as the genuine requirements of new occupations [7,23]. It is naïve to suppose that simply renaming an occupation or providing superficial, formal training can resolve the problem if the fundamental skills and knowledge required for the new work are outdated or entirely absent.

The key aspects of Sraffa's theory that are directly relevant to the analysis of occupational switching in the context of technological progress may be summarised as follows [14]:

- **Interdependence:** The labour market constitutes a complex and interrelated system in which changes occurring in one industry or field of activity inevitably affect others.
- **Physical Conditions of Production:** Account must be taken of the real skills, knowledge, and experience possessed by workers, as well as the extent to which these match the requirements of new occupations [17]. The factor of 'burnout' must also not be overlooked.

To illustrate these processes, the article includes a table of specific examples of occupational switching in the context of technological progress. (Table 2).

Table 2: Occupational Switching in the Contemporary Labour Market According to Sraffa's Theory

#	Obsolescing Occupation	Reasons for Switching	Alternative Occupations	Description of Alternatives
1.	Data Entry Operator	Automation of data entry, OCR and voice recognition systems, cloud storage	Data processing & analysis specialist; Data verification specialist; Automation systems consultant	Adaptation to data analysis, AI training and oversight, user support for new systems.
2.	Retail Cashier	Growth of e-commerce, self-checkout systems, mobile payments	Online sales consultant; Customer support specialist; Order fulfilment operative; Logistics specialist	Online customer consulting, product selection assistance, problem resolution, order handling.
3.	Junior Accountant	Accounting automation, cloud services, AI	Financial analyst; Financial planning consultant; Accounting automation specialist	Advanced data analysis, advisory work, process automation, ERP system implementation.
4.	Taxi Driver	Autonomous vehicle development, car-sharing, rising fuel costs	Autonomous vehicle operator; Fleet management specialist; Traffic data analyst	Oversight of autonomous vehicles, fleet management, traffic data analysis for optimisation.
5.	Junior Lawyer (routine tasks)	AI development for document analysis and drafting claims	AI training specialist in legal sector; AI implementation consultant; Expert lawyer	Neural network training, consulting for lawyers, expert work on complex cases.
6.	Retail Sales Assistant (clothing/footwear)	Growth of online sales, AR/VR fitting rooms, AI consultants	AR/VR online sales specialist; Personal stylist; Social media marketer	Using AR/VR, product promotion, content creation, remote client engagement.

This table demonstrates which occupations are under threat of displacement, the reasons for that displacement, and the alternative forms of employment that may be available to workers whose occupations have become obsolete. Analysis of these examples allows for a better understanding of the mechanisms of adaptation to the changing labour market and helps to identify directions for the development of effective retraining and upskilling programmes.

Conclusion

The contemporary labour market faces unprecedented challenges driven by technological progress, automation, and globalisation. In these conditions, traditional notions of employment stability are undergoing radical transformation. The present study has demonstrated the varying degrees of vulnerability of different worker categories, calling for differentiated approaches to adaptation. The classification of specialists by risk of displacement (PSPR, PSTR, PSNR, PSHR, PNSR) constitutes a valuable instrument for analysing labour market trends and forecasting threats to employment [11].

A central finding of the study is that professional resilience is determined by the capacity for continuous learning (lifelong learning), the development of soft skills, and digital literacy [16]. However, for the effective analysis and management of these processes, as Sraffa emphasised, account must be taken of the 'physical conditions of production' as applied to the labour market: the actual skills, knowledge, and experience of workers, together with the genuine requirements of new occupations. Without this, retraining programmes and adaptation strategies risk proving ineffective [14].

The institutional dimension of the problem is no less important: government employment support programmes, workforce retraining systems, and the modernisation of labour legislation create the necessary environment for adaptation. The effectiveness of measures depends on interaction between the state, educational institutions, and business. A comprehensive approach will ensure a smooth transition to a new model of employment, minimising the social costs of technological transformation [18].

The only constant feature of the contemporary professional environment is the necessity of continuous adaptation (switching) and readiness for change. It is precisely these qualities that will determine professional success in the coming decades, shaping a new landscape of the labour market in which flexibility and the capacity to learn are valued no less than narrowly specialised knowledge and skills.

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