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MODELS OF DIGITALIZATION OF RECRUITMENT PROCESSES IN THE PUBLIC ADMINISTRATION SYSTEM: CONCEPTUAL-PHILOSOPHICAL AND APPLIED ASPECTS

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Abstract. The digitalization of recruitment processes is becoming a key factor in the transformation of public administration, enabling the modernization of outdated approaches to personnel selection and enhancing the efficiency of the civil service. Therefore, purpose of this study to summarize the leading international models of digital recruitment and to develop an integrated concept that combines technological, procedural, ethical, and social principles to improve the effectiveness of human resource management in the public sector. The research methodology is based on a comparative-analytical approach to modern digital recruitment models proposed by foreign experts. Additionally, methods of system analysis, modeling, deduction, generalization, and regulatory-legal analysis of Ukrainian legislation were applied. This methodological framework made it possible to construct a synergistic model of adapted digital recruitment suitable for Ukraine's institutional context. The research findings of the study revealed that existing models tend to focus on specific aspects such as technical security, sustainable development, algorithmic neutrality, or analytical typology. In response, the «Ukrainian Resilience-Oriented e-Recruitment Model» was developed to ensure replicability of recruitment competitions across regions, enable remote verification of candidate's education and experience, eliminate subjective evaluations, and create equal access opportunities for citizens including veterans, internally displaced persons (IDPs), and young professionals. Its structural logic envisions interaction with state registers, AI-based resume parsing systems and ESG modules for assessing motivation and value orientation of candidates. Value of the research of the study lies in the fact that the «Ukrainian Resilience-Oriented e-Recruitment Model» has the potential to transform digital recruitment into an open personnel ecosystem of Ukraine within the framework of public administration.

Keywords: digital recruitment in public administration, algorithmic candidate assessment, HR platforms, artificial intelligence, sustainable digital recruitment model

JEL Classification: H83, J45, O38

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INTRODUCTION

In the current conditions of information technology development, the process of personnel selection in public institutions is gradually shifting to a digital format. Electronic recruitment of civil servants involves algorithmically controlled procedures with minimal human influence, ensuring unified criteria for evaluation, transparency, and verifiability at each stage of selection. At the same time, the rapid introduction of technologies generates new challenges related to technical risks, infrastructure instability, and the need for legal regulation of algorithmic decision-making. For Ukraine, where geopolitical and socio-economic crises, including the pandemic and the state of war, impose additional demands on the resilience of the public sector, solutions that ensure trust, equal access, and repeatability of recruitment procedures become particularly important. Therefore, in this context, there is a need to systematize existing approaches to e-recruitment in public administration and to develop an integrated model that combines best practices of different concepts and corresponds to the specific conditions of the Ukrainian context.

LITERATURE REVIEW

Analyzing current research on digital recruitment in the public sector shows that there is a significant variety of conceptual models that demonstrate different approaches to forming electronic personnel selection systems. Unlike traditional works, which mainly focus on technical aspects or the automation of individual selection stages, digital recruitment models offer multi-vector solutions that combine technological, analytical, social, and managerial components. In particular, the «Digital Civil Servant Recruitment Model» (Mustofa, Suswanta, Zaenuri, 2022) was developed during the COVID-19 pandemic and is implemented through online selection systems. In this model, candidates take administrative and professional tests remotely, with identity verification and fraud protection (authorization, proctoring). The system is aimed at increasing the transparency of public competitions and ensuring the security of selection in civil service. «The Sustainable Recruitment Model (Milky Way Map)» (Koman, Boršoš, 2024) is a conceptual model of sustainable recruitment that defines ecological, social, and economic directions in personnel selection, using IT tools to reduce negative impact and optimize recruitment. The model primarily focuses on introducing a “green” orientation by selecting candidates with experience in eco-management and implementing innovative HR practices (electronic reporting, remote recruitment with sustainability criteria). Another model, «NCHE-4-R-AP-FP (AI-Driven E-Recruitment)» (Pollifroni, Ioana, Canuta, Bucuroiu, Pollifroni, 2025), is oriented toward higher education. It replaces traditional competitive procedures with automated ones, using artificial intelligence to assess candidates (particularly academic staff) and perform data analytics. The model aims to eliminate physical selection committees, ensure impartial decision-making, and enhance transparency in academic recruitment through digitalization and analytical evaluation. The conceptual model «POCM and Onto-RPD e-Recruitment» (Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018) structures the recruitment process around «root problems» of personnel selection and is supplemented by the Onto-RPD ontology. It builds a system of concepts and relationships for describing recruitment issues in logical-analytical categories (terminological consistency, semantic mapping). The primary goal of this model is to improve clarity in defining recruitment problems and enable large organizations to analyze hiring needs based on semantic analysis.

Another conceptual model, «Initial e-Recruitment IS/IT» (Koman, Toman, Jankal, Boršoš, 2024), consists of two components: 1. the recruitment process; 2. the technological platform. The process component defines the sequence of selection steps (online résumé submission, testing, remote interviewing), while the technological component involves IT tools to support the process (software, databases). This model is designed to optimize public sector e-recruitment by defining core HRM modules and integrating new IT solutions to increase personnel selection efficiency. The

conceptual model «Typological Framework of e-Recruitment Adoption» (Llorens, 2011) describes levels of digital maturity in organizations implementing e-recruitment. It classifies ways in which public institutions use online platforms (e.g., institutional vacancy websites, social networks, outsourcing). This model does not propose new technological mechanisms but explains differences between organizations based on institutional factors (demographics, bureaucratic barriers, level of IT support).

Thus, the comparative analysis of the above models shows that each has its own focus and limitations. The «Digital Civil Servant Recruitment model» ensures secure remote selection but concentrates mainly on technical implementation rather than strategic human resource management. «The Sustainable Recruitment (Milky Way Map)» model introduces social-environmental criteria but has lower algorithmic complexity. The «AI-driven NCHE-4-R-AP-FP model» seeks to eliminate bias through artificial intelligence but is less sensitive to social context. «POCM and Onto-RPD» focus on systematic problem analysis but are difficult to implement in practice. The «Initial e-Recruitment» IS/IT model offers high applicability in the public sector but lacks deep conceptual grounding. The Typological Framework of e-Recruitment Adoption explains the evolution of digital adoption but does not alter the recruitment mechanism itself.

Overall, the digitalization of recruitment processes is multi-directional, where technical, ethical, analytical, conceptual, and institutional logics coexist as complementary systems. Despite the contribution of each model, there remains a lack of research on integrating their key principles into a single system that accounts for the specific context of Ukraine and the challenges of post-war recovery.

PAPER OBJECTIVE

The purpose of the article is to conduct a comprehensive analysis of existing conceptual models of digitalization of recruitment processes and to develop a new synergistic model focused on increasing the transparency of civil service selection and ensuring the continuity of personnel processes in Ukraine’s public sector under crisis conditions. The research tasks are defined as follows: 1. to analyze the most modern conceptual models of e-recruitment; 2. to identify the structural and functional features and differences of each model; 3. to synthesize the best practices of current e-recruitment models in order to develop the «Ukrainian Resilience-Oriented e-Recruitment Model».

METHODOLOGY

The methodological basis of the study is formed by comparative analysis, modeling, abstraction, deduction, induction, regulatory and legal analysis, and a systemic approach. The comparative analysis ensured a structured comparison of scientific models of digital recruitment, which made it possible to identify their strengths and weaknesses. The modeling method was used to construct the conceptual «Ukrainian Resilience-Oriented e-Recruitment Model» in an abstract-logical form based on the generalization of best practices identified through comparative analysis. The application of abstraction, deduction, and induction facilitated the systematization of concepts and the formulation of universal principles for building digital recruitment. These methods made it possible to distinguish key elements of the process and to synthesize a generalized model. The regulatory and legal analysis covered Ukrainian legislative and regulatory acts in the field of public service and personnel policy, which made it possible to take into account national specifics, particularly the requirements for competitive procedures and social programs that are not present in foreign approaches. The systemic approach ensured the consideration of recruitment as an integrated multi-level process that includes conceptual, procedural, technical, and social dimensions and defines the interconnections between them.

RESULT AND DISCUSSION

In the context of the current digital transformation of public administration, the analysis of existing models of digitalizing recruitment processes becomes particularly significant. They reflect different approaches to automating personnel selection, integrating artificial intelligence technologies, and ensuring the transparency and efficiency of managerial procedures. Studying such models makes it possible to determine conceptual guidelines and practical mechanisms for adapting digital tools within the sphere of public administration. A comparative overview of modern models of digital recruitment is presented below (Table 1).

The analysis of contemporary models of digitalizing recruitment processes presented in Table 1, reveals significant differences in their structural design, conceptual content, and managerial orientation.

«The Digital Civil Servant Recruitment Model» (Mustofa, Suswanta, Zaenuri, 2022) focuses primarily on the technical function of secure online selection, where digital tools serve as an operational substitute for traditional procedures (remote testing, authorization, encryption). This model demonstrates a high level of technological reliability by ensuring identity verification and protection against fraud. However, it is considerably weaker in the domain of strategic human resource management. In contrast, the» Sustainable Recruitment Model (Milky Way Map)» (Koman, Boršoš, 2024) moves away from a narrow technocratic logic and conceptualizes recruitment as part of a broader sustainable development policy (ESG orientation, ethical selection, energy efficiency). While the Digital Civil Servant Recruitment Model prioritizes functional efficiency, the Sustainable Recruitment Model emphasizes the social and environmental responsibility of recruitment practices, shifting the focus from technical to ethical and value-based considerations. At the same time, this model has less algorithmic depth and lacks the precise data processing capabilities found in systems with integrated artificial intelligence. Against this background, the «NCHE-4-R-AP-FP (AI-Driven E-Recruitment) Model» (Pollifroni, Ioana, Canuta, Bucuroiu, Pollifroni, 2025) is distinguished by its aim to eliminate the human factor through the use of artificial intelligence in making recruitment decisions (evaluation of academic staff, digital selection, automated data analysis). Whereas the Sustainable Recruitment Model prioritizes value balance, NCHE-4-R-AP-FP emphasizes algorithmic neutrality and analytical objectivity. Its key advantage lies in ensuring impartiality of selection; however, compared to the Sustainable Recruitment Model, it is less sensitive to social context and requires regulatory safeguards to prevent algorithmic bias. Thus, a contrast emerges between social adaptability and technical precision. The «POCM and Onto-RPD e-Recruitment concept» (Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018) shifts the focus from process automation to the semantic structure of recruitment. Unlike the previous models, it builds an ontological system of concepts and relationships that describe recruitment issues in logical-analytical categories (terminological consistency, semantic mapping). While «NCHE-4-R-AP-FP» seeks to objectify decisions through algorithms, «POCM/Onto-RPD» purpose to explain the nature of recruitment problems through conceptual description, enabling more precise and flexible analysis. However, this significantly complicates scaling in inter-agency environments where terminology harmonization requires regulatory coordination. Compared to the sustainability-oriented model, «POCM/Onto-RPD» is intellectually deeper but less ready for practical implementation. The «Initial e-Recruitment IS/IT Model» (Koman, Toman, Jankal, Boršoš, 2024) integrates functional and technological dimensions into a coherent architecture. Whereas «POCM/Onto-RPD» focuses on conceptual representation, this model applies an engineering logic in which recruitment processes are synchronized with specific IT solutions (online résumés, remote interviews, automated scoring). Its strength lies in practical implementability, as it combines software modules, databases, and digital interfaces. However, compared to «POCM/Onto-RPD», it provides less conceptual depth. In this sense, the «Initial e-

Recruitment IS/IT Model» functions not as a theoretical schema but as a prototype of a future state HR platform, making it more attractive for real-world implementation.

Table 1

Modern models of digital recruitment

Authors	Model name	The essence of the model and its application
In'amul Mustofa, Suswanta Suswanta, Muchamad Zaenuri [1]	«Digital Civil Servant Recruitment Model»	A digital selection model developed for the conditions of the COVID 19 pandemic. An online recruitment system is proposed, where candidates pass administrative, basic and professional tests remotely. The system provides protection against fraud (authorization, anti-control) and data encryption. It is used to reorganize state competitions, reduce congestion, increase transparency and security of selection in the civil service.
Gabriel Koman, Patrik Boršoš, Milan Kubina [2]	«Sustainable Recruitment Model (Milky Way Map)»	The conceptual model of sustainable recruitment identifies key areas for ensuring a «green» (environmentally, socially and economically) orientation of the process. Takes into account the role of IT in reducing the negative impact and optimizing recruitment. It is used to introduce innovations in HR practices of companies and government agencies (e.g. electronic reporting, remote selection with sustainability in mind).
Massimo Pollifroni, Adrian Ioana, Ionela Luminita Canuta (Bucuroiu), Francesco Pollifroni [3]	«NCHE-4-R-AP-FP (AI-Driven E-Recruitment)»	An innovative e-recruitment model for the higher education system. It involves the transformation of traditional competitive procedures into comparative (comparative) processes. The model integrates AI (artificial intelligence) into selection processes, abolishes physical selection committees and completely digitalizes recruitment. It is used to increase the transparency of the teaching staff competition, prevent corruption and ensure the independence of selection (i.e., an «impartial» decision through automation and analytics).
Saleh Alamro, Huseyin Dogan, Deniz Cetinkaya, Nan Jiang, Keith Phalp [4]	«POCM та Onto-RPD e-Recruitment»	Conceptual model and ontology for enterprise e-Recruitment. POCM (Problem-Oriented Conceptual Model) is structured around the main «root problems» of recruiting, taking into account several points of view, supplemented by the Onto-RPD ontology, which formalizes the concepts and relationships of problem aspects. It serves to fully describe recruiting processes, increases the clarity of the formulation of personnel selection problems (especially in a business environment). It is used in large organizations and HR systems to improve the modeling of hiring needs, identify barriers and design solutions based on semantic analysis.
Gabriel Koman, Dominika Toman, Radoslav Jankal, Patrik Boršoš [5]	«Initial e-Recruitment IS/IT Model»	Conceptual model of e-Recruitment within the framework of «smart government». Consists of two parts: the recruitment process and the technological platform. The process part defines the procedures and steps of employee selection, the technological part defines IT tools and resources to support this process (software, automation systems, databases). It is used for planning and optimizing e-recruitment in the public sector to determine key functional modules of HRM (online resume, testing, remote interview) and integration of new IT solutions into the selection process.
Jared J. Llorens [6]	«Typological Framework of e-Recruitment Adoption»	The model identifies variations and stages of e-Recruitment implementation in government agencies. It highlights different ways in which public organizations adopt web technologies and network platforms for recruitment (own job sites, social networks or outsourcing agencies). It is used to study the drivers and consequences of digitalization of HR processes in the public sector (demographic factors, bureaucratic barriers, level of IT support), as a planned "roadmap" for optimizing recruitment.

**Source: (Mustofa, Suswanta, Zaenuri, 2022; Koman, Boršoš, 2024; Pollifroni, Ioana, Canuta, Bucuroiu, Pollifroni, 2025; Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018; Koman, Toman, Jankal, Boršoš, 2024; Llorens, 2011)*

The «Typological Framework of e-Recruitment Adoption» (Llorens, 2011), unlike all the previous models, does not propose new technological mechanisms but establishes a classification of organizations based on the degree of digital recruitment adoption (government portals, social

networks, outsourcing). While the «Initial e-Recruitment IS/IT Model» presents a centralized and structured technological process, the Typological Framework focuses on institutional factors that determine the pace and nature of digital transformation. Its strength lies in explaining differences between organizations, but its practical utility emerges only when a mature digital governance infrastructure already exists. Compared to the «Digital Civil Servant Recruitment Model», which solves technical implementation tasks, the Typological Framework operates at the level of methodological generalization, making it valuable for establishing standards of digital maturity. Thus, these models demonstrate a clear differentiation in priorities and logic of application. The «Digital Civil Servant Recruitment Model» ensures security and technical stability but does not generate analytical insight. The «Sustainable Recruitment Model» introduces socio-environmental criteria but lacks algorithmic precision. «NCHE-4-R-AP-FP» provides intelligent automation but lacks humanitarian sensitivity. «POCM/Onto-RPD» constructs systematic analytical logic but remains difficult to scale. The «Initial e-Recruitment IS/IT Model» turns recruitment into an engineering-driven system but lacks deeper conceptual grounding. The «Typological Framework explains the adoption process but does not change the selection mechanism itself. The comparison of these approaches demonstrates that digitalization of recruitment is multidimensional, where technical, ethical, analytical, conceptual, and institutional logics coexist as complementary elements that shape the future architecture of human resource management in the digital public sector.

The next step is to examine each digital recruitment model in the context of public administration individually.

Let us analyze in detail the «Digital Civil Servant Recruitment» model (Mustofa, Suswanta, Zaenuri, 2022) in Figure 1.

The «Digital Civil Servant Recruitment Model» (Mustofa, Suswanta, Zaenuri, 2022) presented in Figure 1 is purpose at developing an algorithmically controlled assessment environment, in which the key role is played by platform-based infrastructure and standardized interaction scenarios among participants. The core logic of the model is based on the understanding that the competition functions as a technological process with minimal involvement of intermediary personnel, starting from candidate registration and ending with the formation of results. This makes it possible to shift the evaluation process from subjective commission decisions to automated procedures, where the human factor is reduced through algorithmic verification and digital control (automatic comparison of documents with state registers, facial identification during testing) (Văduva, 2024).

Transparency in this model is ensured through the unification of evaluation criteria and the recording of every interaction in digital protocols, which guarantees verifiability at each step. This is particularly important when a large number of candidates are tested simultaneously, allowing deviations in results to be quickly detected (for example, identifying attempts at synchronized responses during online proctoring). At the same time, reliance on stable IT infrastructure creates technical risks, since the effectiveness of the process directly depends on server capacity and the level of personal data protection. During periods of peak load, such as large-scale competitions for positions in central authorities, insufficient scalability of the system may delay result processing and require temporary limitation of simultaneous sessions.

In practical terms, the model expands competition accessibility and allows candidates who were previously physically excluded from selection procedures due to geographical or logistical barriers to participate. This is particularly relevant in recruitment for territorial branches, where applicants from different administrative districts can take tests from home or local access centers without travel costs. The model is also used when a public authority needs to quickly form a personnel reserve for operational tasks, for example during crisis events when in-person testing is impossible, but continuity of recruitment must be ensured.

Figure 1. Model «Digital Civil Servant Recruitment»

**Source: (Mustofa, Suswanta, Zaenuri, 2022)*

Let us now analyze the «Sustainable Recruitment Model» (Milky Way Map) (Koman, Boršoš, 2024) in Figure 2.

According to Figure 2, the «Sustainable Recruitment Model» (Milky Way Map) (Koman, Boršoš, 2024) interprets personnel selection as part of a broader strategy of organizational responsibility, where candidate evaluation and the selection procedure itself are integrated into the logic of long-term impact on the ecological, social, and economic dimensions of organizational activity. The central idea is the systematic mapping of recruitment processes based on the Milky Way Map approach, which makes it possible to identify points of intersection between the interests of the organization, society, and its operating environment.

As a result, recruitment ceases to be merely an operational process and becomes a mechanism for shaping a culture of sustainability and responsible human capital management (for example, prioritizing candidates with experience in eco-management). Within this model, candidate evaluation is combined with an analysis of their contribution to the organization's value orientation, shifting attention from purely professional competence to the ability to support sustainable

development goals and work within socially responsible practices. This becomes particularly evident in hiring for urban development or energy modernization projects, where the choice of personnel must not contradict the organization's ecological or social policy (such as smart city initiatives or energy efficiency programs) (Aust, Matthews, Müller-Camen, 2020).

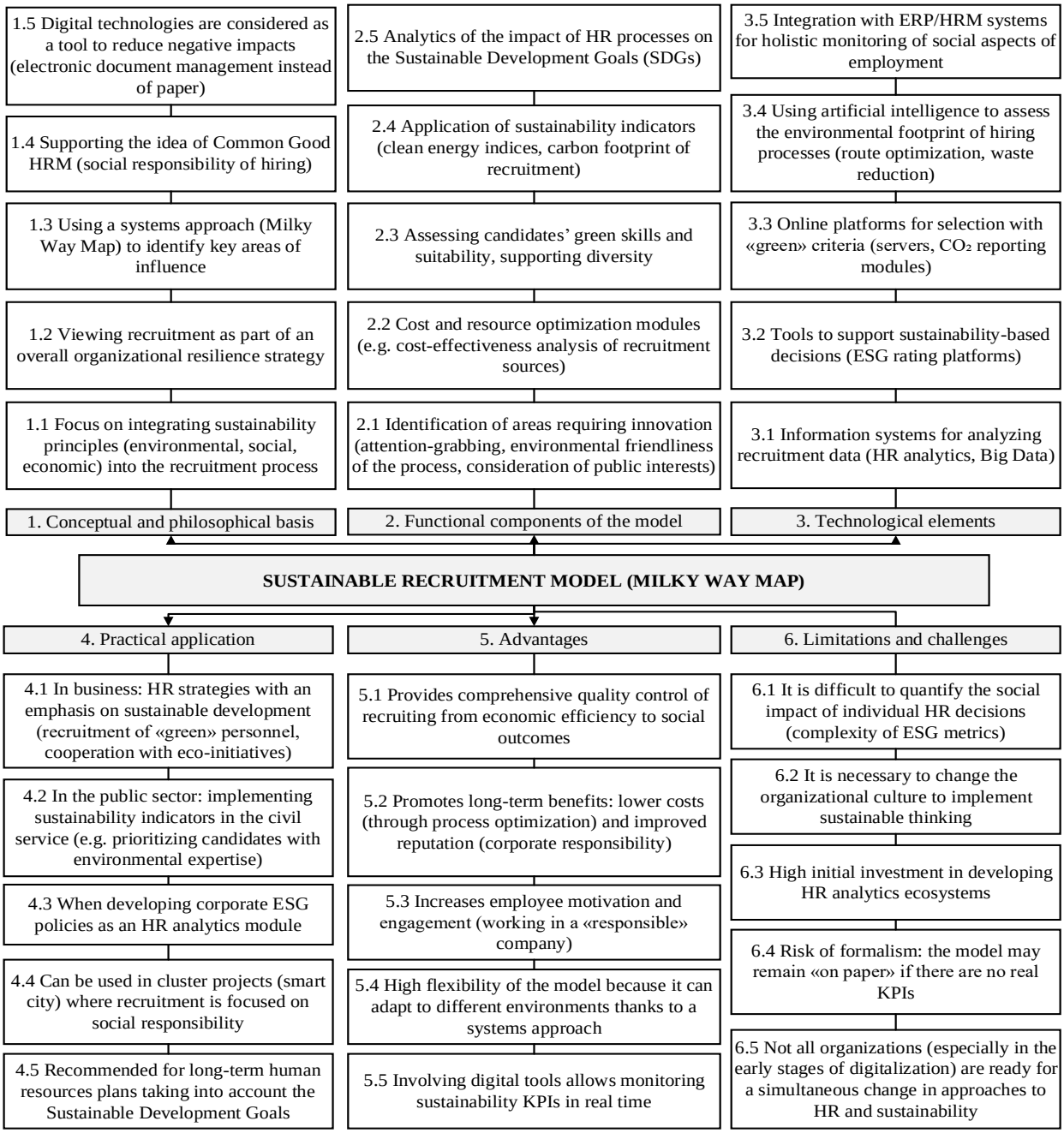

Figure 2. Sustainable Recruitment Model (Milky Way Map)

**Source: (Koman, Boršoš, 2024)*

The technical core of the model is formed through HR analytics and tools for assessing the impact of recruitment processes on sustainability indices, which allows recruitment to be viewed not as a one-time decision but as a controlled process with a predictable effect. The use of ESG monitoring platforms and digital dashboards enables comparison of hiring costs, impact on

corporate culture, and long-term value for the organization. In practice, this is reflected when an HR department compares several candidate acquisitions channels not only by speed and cost, but also by the level of social engagement or the carbon footprint of the recruitment procedure (Renwick, Redman, Maguire, 2013). At the same time, the «Sustainable Recruitment Model (Milky Way Map)» requires a significant rethinking of managerial approaches, since its implementation presupposes that the organization deliberately embeds sustainability principles into internal policies and performance evaluation systems. The difficulty of quantitatively assessing social or environmental impact may limit the precision of outcome measurement, while the absence of a mature digital infrastructure may slow down scaling.

Next, we will analyze in detail the «NCHE-4-R-AP-FP (AI-Driven E-Recruitment) Model» (Pollifroni, Ioana, Canuta, Bucuroiu, Pollifroni, 2025) presented in Figure 3.

Based on Figure 3, the «NCHE-4-R-AP-FP (AI-Driven E-Recruitment) Model» (Pollifroni, Ioana, Canuta, Bucuroiu, Pollifroni, 2025) interprets academic recruitment as a process governed by digital algorithms, the purpose of which is to eliminate subjectivity and ensure transparent competition among researchers at different stages of their academic careers. The central element is the transition from individual selection committees to a standardized evaluation platform, where key decisions are made on the basis of algorithmic analysis of data on publication activity, academic experience, and potential research contributions. This transforms the hiring procedure from a traditional expert review of candidate dossiers into a structured system of automated selection that operates according to verifiable and reproducible criteria (for example, semantic model–based analysis of research texts or AI-driven ranking of academic profiles) (Upadhyay, Khandelwal, 2018).

The two-phase evaluation logic of this model ensures a consistent and controllable process in which, first, an automated assessment of competencies is performed through digital tests and résumé parsing, and then a comparative matching of candidates is carried out on the basis of standardized indicators. This arrangement eliminates selective interpretation of requirements, since all candidates pass through identical stages with a predefined evaluation structure. In practice, this is especially evident in university systems with intense competition, where the number of applicants exceeds the capacity for manual dossier review (for example, selection of research staff at national research universities).

The technological core of the model combines artificial intelligence with centralized electronic databases, enabling the processing of large volumes of academic data and the replication of the evaluation process under identical conditions for each applicant. Tools for online interviews and behavioral analytics substitute for physical committees, reducing opportunities for informal influence or hidden arrangements. This becomes critical in appointments to positions of high academic standing, where even minimal shifts in criteria can undermine equality of access (such as professorial competitions at European universities). At the same time, the model raises challenges related to the perceived legitimacy of algorithmic decisions. Parts of the academic community may distrust automated tools, particularly when algorithms analyze the content of scholarly publications or measures of scholarly impact without explaining the underlying calculation logic. An additional difficulty lies in the need for high-quality preparation of input data, since any structural errors in information arrays can be automatically propagated.

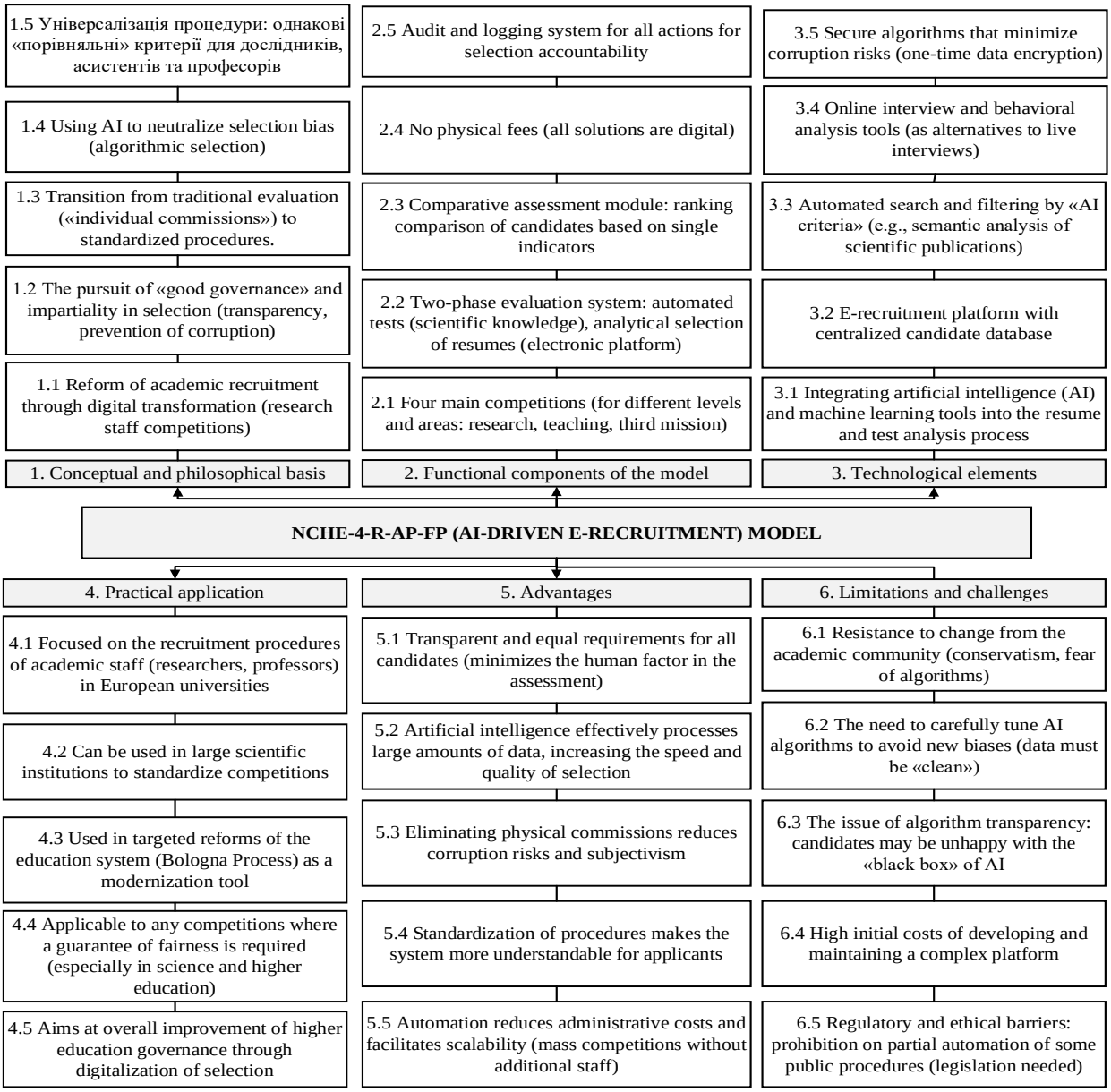

Figure 3. Model NCHE-4-R-AP-FP (AI-Driven E-Recruitment)

**Source: (Pollifroni, Ioana, Canuta, Bucuroiu, Pollifroni, 2025)*

Next, we will analyze in detail the «POCM and Onto-RPD e-Recruitment Model» (Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018) shown in Figure 4.

The «POCM and Onto-RPD e-Recruitment Model» (Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018) shown in Figure 4 conceptualizes recruitment as a system of semantic interrelationships, where the primary emphasis lies not on the selection tool itself but on establishing a shared understanding of what the organization regards as candidate competence and relevance. In this view, recruitment is treated as a networked process with multiple points of perception and interpretation, which explains frequent misunderstandings between HR and operational teams.

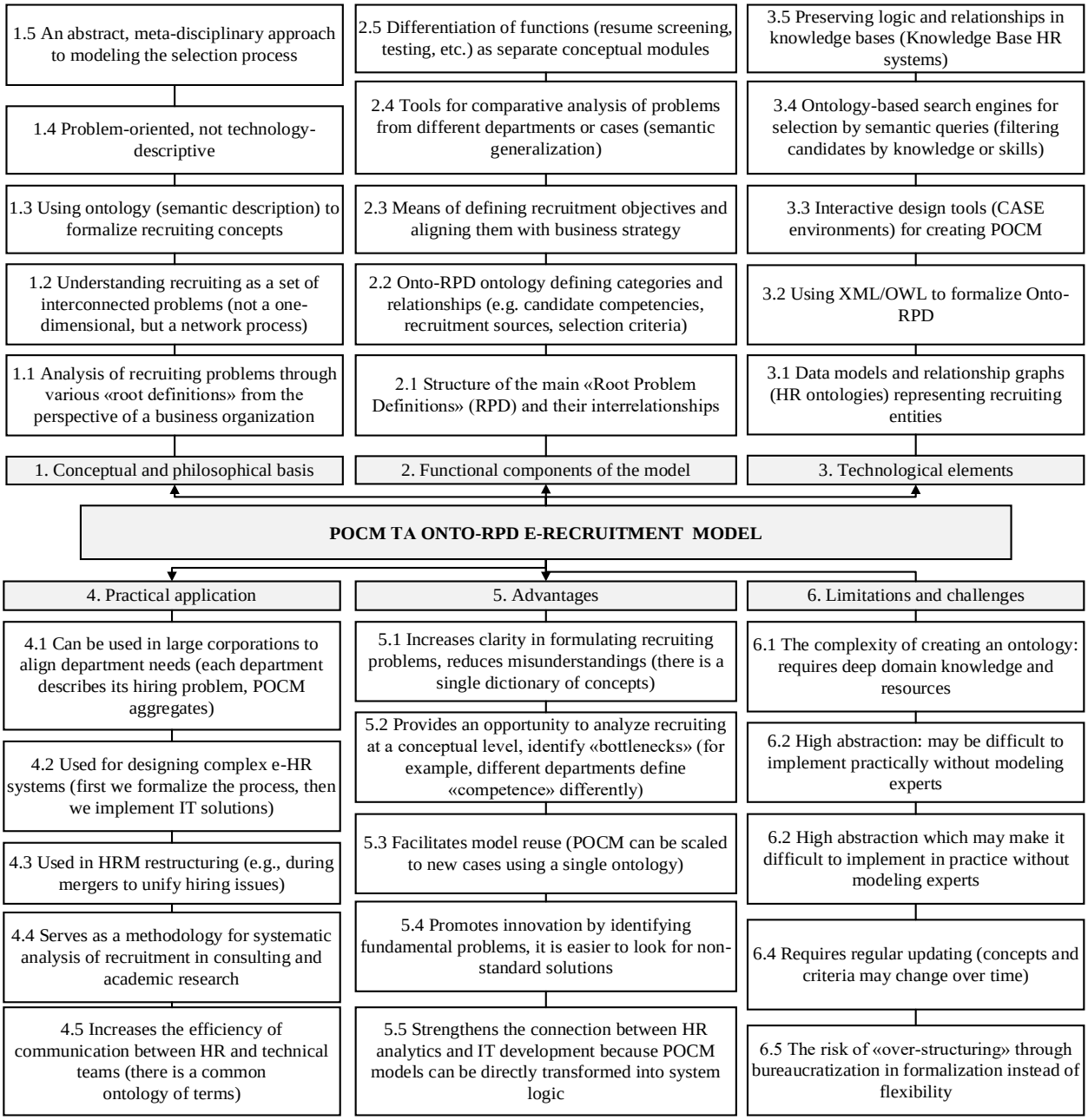

Figure 4. Model POCM ma Onto-RPD e-Recruitment

**Source: (Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018)*

Building the Onto-RPD ontology makes it possible to formalize terms and definitions, eliminating discrepancies in how basic concepts are interpreted (for example, when different units use the term “analytical skills” with incompatible meanings). The functional logic of the model involves constructing the structure of root recruitment problems and aligning them with business goals. This structure does not depict the process sequentially; rather, it represents it as a system of semantic dependencies that affect outcomes. The practical effect emerges in situations where a company manages diverse vacancy groups and faces incompatible selection criteria. Using POCM allows these criteria to be synchronized and a single decision-making framework to be established (for instance, during restructuring or mergers, when candidate evaluation standards must be harmonized) (Saleh, Dogan, Cetinkaya, Jiang, Phalp, 2018).

The model's technological foundation employs graph structures and formal knowledge representation languages for storing and retrieving information, which enables semantic candidate matching based on the substance of competencies rather than keywords, improving precision and reducing the impact of accidental matches. In practice, this means the system recognizes relevant candidate experience even if it is described with different terminology or résumé structures (such as detecting process management experience from described project roles rather than from a certification title). In application, the model is most effective in organizations with complex horizontal management structures and a large number of interdependent staffing requests. It is also useful in consulting, where the task is to uncover the deep causes of recruitment problems and build recommendations within a coherent logic rather than through isolated fixes. Its weakness is the high implementation complexity, since building an ontology requires modeling expertise and regular updates to the content layer.

Next, we will analyze in detail the «Initial e-Recruitment IS/IT Model» (Koman, Toman, Jankal, Boršoš, 2024) shown in Figure 5.

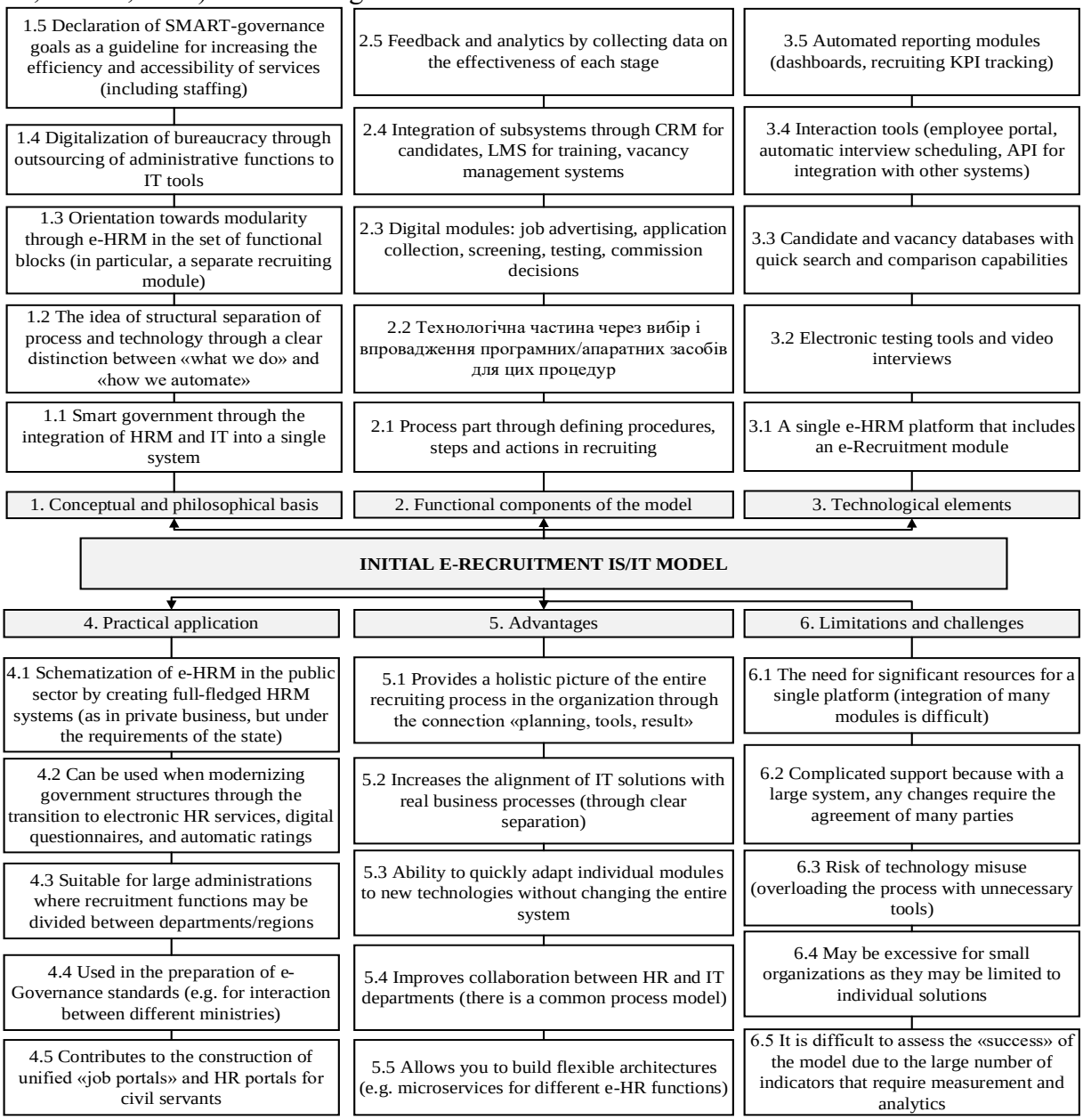

Figure 5. Model Initial e-Recruitment IS/IT

**Source: (Koman, Toman, Jankal, Boršoš, 2024)*

According to Figure 5, the «Initial e-Recruitment IS/IT Model» (Koman, Toman, Jankal, Boršoš, 2024) interprets recruitment as part of a broader smart-government architecture, where human resource management and digital technologies are viewed as a unified system. The key feature is the distinction between the process layer and the technological layer, in which the precise actions and logic of recruitment are defined first, and only then are the IT tools selected to support them. This approach prevents situations where technology dictates the structure of processes or substitutes managerial goals with technical capabilities. As a result, recruitment appears as a governed process that has a substantive foundation supported by technology aligned with it (for example, video-interview modules are introduced only after evaluation criteria are clearly defined).

The functional logic of the model is built around a sequential organization of the recruitment cycle, where each stage has a formalized role. First, the vacancy announcement is created, then applications are collected, followed by screening, assessment, and decision-making. A key advantage is that technological solutions can be changed or expanded without disrupting the overall structure of the process. This makes the system scalable for organizations with multiple departments and local HR centers (for example, public administrations where recruitment is managed by different regional offices operating within a unified procedural framework).

The technological component of the model is based on a centralized e-HRM platform that includes candidate databases, interaction modules, automated testing services, and reporting modules. This centralization allows recruitment to be managed from a single interface, while candidate data can be reused across various stages of the HR cycle (onboarding, adaptation, performance evaluation). The platform not only integrates procedures but also enables feedback through analytical dashboards, allowing the effectiveness of selection stages to be assessed both in the short and long term (such as analyzing vacancy time-to-fill or the accuracy of initial screening) (Marler, Parry, 2015).

Practical application of the model is most evident in large administrative systems and the public sector, where recruitment must be reproducible, transparent, and aligned across different organizational levels. In such conditions, the modular architecture allows personnel actions to be systematized and reduces the process's dependence on individual specialists or local practices. The model also provides the technical foundation for building national vacancy portals and specialized platforms for civil servants (centralized electronic candidate accounts).

Next, we will analyze in detail the «Typological Framework of e-Recruitment Adoption Model» (Llorens, 2011) shown in Figure 6.

The «Typological Framework of e-Recruitment Adoption Model» (Llorens, 2011) shown in Figure 6 views digital recruitment not as a universal technical solution, but as a process that depends on the characteristics of a specific organization, its resources, managerial culture, and external environment. The core idea is that different institutions move toward digital recruitment at different speeds and along different pathways, and therefore real digitalization practices are always formed at the intersection of technological readiness, personnel policy, and the context of public administration. This explains why some organizations quickly transition to integrated e-HR platforms, while others limit themselves to basic use of job-posting websites or social media (for instance, when a small local administration uses Facebook for announcements, whereas a large ministerial structure operates through a centralized HR portal) (Gueutal, Strohmeier, Kabst, 2009).

The functional logic of the model lies in classifying recruitment strategies depending on the degree of process digitalization and the level of organizational readiness. It distinguishes between traditional, internet-oriented, and hybrid practices, which makes it possible to determine the stage of digital development an organization is currently in and which steps may follow next. The model also takes into account catalysts and barriers to implementation, which may be internal (management culture, experience with IT) or external (labor market conditions, political circumstances). In practice, this helps public institutions assess whether they should immediately

transition to integrated recruitment systems or first consolidate basic tools (for example, using a single vacancy portal as an initial step).

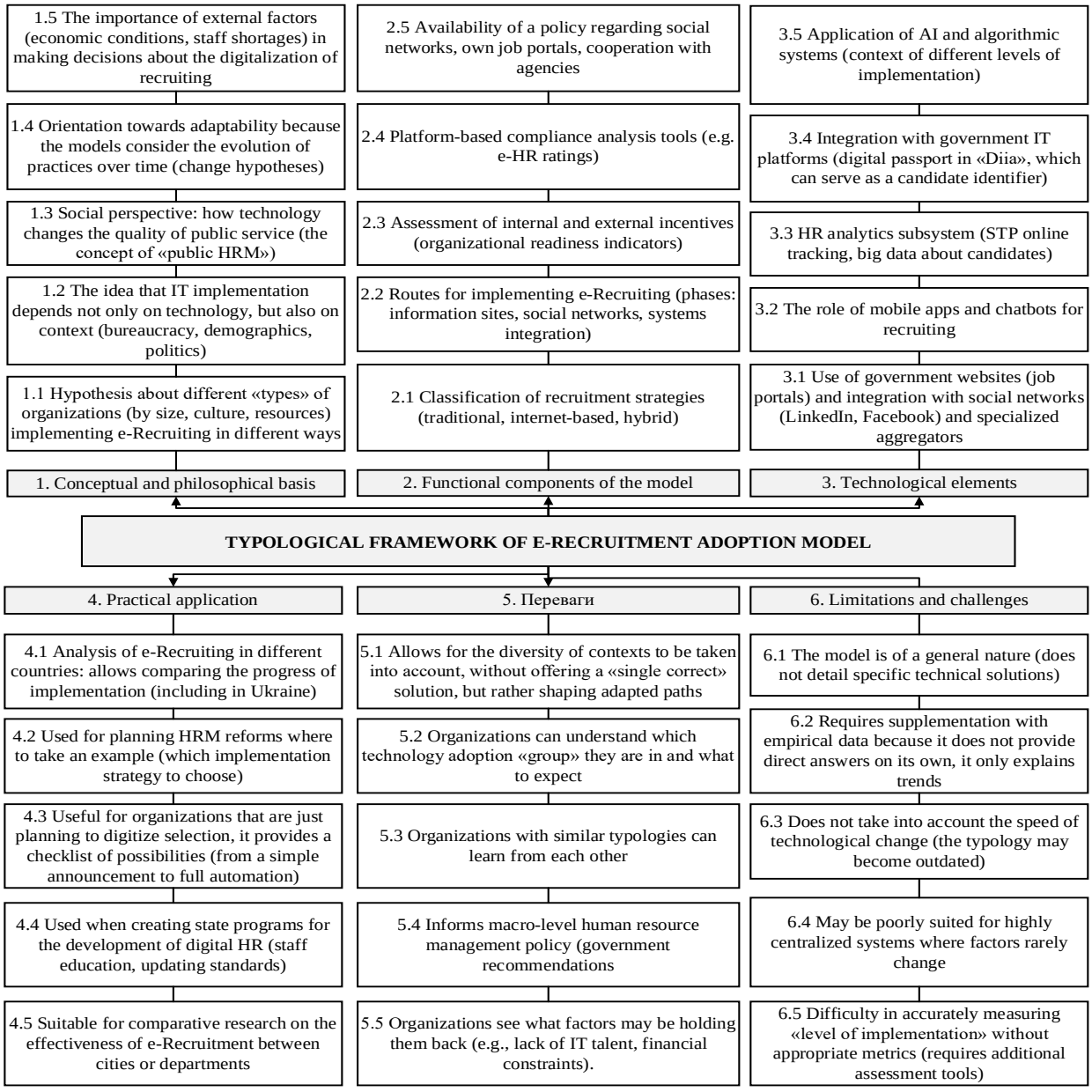

Figure 6. Typological Framework of e-Recruitment Adoption Model

**Source: (Llorens, 2011)*

The technological component of the model does not prescribe specific platforms but outlines a potential range of digital tools from simple websites to multi-level analytical systems. Application depends on the type of organization: in some cases, an informative web portal is sufficient, while in others, the use of AI systems for analyzing candidate data and behavioral patterns during selection becomes appropriate. This is clearly illustrated when comparing municipal administrations that use chatbots for application intake and national authorities that implement automated ranking systems and digital identity verification (for example, using electronic documents in the «Diia» application for identity confirmation).

The practical value of the model lies in its ability to support strategic planning of recruitment system development. Organizations receive a self-assessment instrument that allows them to understand their position within the digital typology and to identify realistic transition steps. This is particularly important for public institutions where changes require coordination and gradual implementation, as well as for interregional comparisons during the development of personnel development programs or HR service reforms.

Based on the analysis of contemporary models of digitalizing recruitment processes (Figures 1-6), we will develop the «Ukrainian Resilience-Oriented e-Recruitment Model», which will reflect the best conceptual, functional, technological, and practical principles of resilience in the context of digitalizing recruitment processes in public administration in Ukraine, see Figure 7.

The proposed «Ukrainian Resilience-Oriented e-Recruitment Model» in Figure 7 will create a public recruitment environment in which openness becomes a fundamental norm of personnel decision-making, since every stage of the competition process will be subject to independent verification and displayed in digital form (for example, public decision logs similar to NACP competitive selections). Trust will increase through the automation of key evaluation and ranking operations, which will minimize the influence of personal arrangements and equalize conditions for all candidates regardless of region or status. Resilience will be reflected in the model's ability to be continuously reproduced according to unified rules during institutional relocation, workload fluctuations, or emergency conditions (for example, recruitment during martial law). The dignity of public service will emphasize that state employment is a form of civic service rather than a transactional interaction, which is especially important for social protection systems and local governance. Fairness will be ensured through algorithmic matching of competencies with predefined criteria, eliminating selectivity and establishing a predictable logic of outcomes (for example, AI-based analysis of professional relevance).

The «Ukrainian Resilience-Oriented e-Recruitment Model» will form a unified digital recruitment cycle in which registration, identification, evaluation, ranking, and talent pool formation are linked into a single continuous system without informal interventions. Virtual competitions will become the standard assessment format, providing accessibility from any location and removing logistical barriers for communities affected by war or economic disruption (for example, recruitment to Administrative Service Centers in recovery regions). Remote inclusion will enable the participation of candidates from frontline and de-occupied territories, thereby expanding the state's human capital potential. The social responsibility assessment module (ESG-orientation) will allow consideration of motivational and civic values, which is particularly important for administrative recovery functions (for example, engaging veterans in social support centers). The reverse audit mechanism will make it possible to review competition results in a structured format, ensuring legitimacy and predictability of decisions.

The technological infrastructure of the «Ukrainian Resilience-Oriented e-Recruitment Model» will be built on the integration of state digital platforms. Identification through «Diia» or «BankID» will provide identity verification without physical presence. Data exchange will be conducted via «Trembita», enabling automatic access to the «Unified State Education Database», civil status registries, and military registration systems to verify education, work experience, and candidate status. AI-based résumé parsing will perform semantic matching of described skills with job profiles (for example, recognizing the equivalence of «data research» and «data analytics»). Mobile accessibility will ensure participation from smartphones and tablets to support rapid response to staffing needs. Encryption and online proctoring will guarantee the security and reliability of the testing procedure.

The practical application of the «Ukrainian Resilience-Oriented e-Recruitment Model» will involve its use in «Regional military administrations, Administrative Service Centers», and ministries for rapid staffing in critically important sectors of public service (for example, administrative support for territorial recovery). The education sector will receive standardized

selection criteria for lecturers and researchers in public universities, reducing risks of patronage networks. Temporary administrations will be able to quickly form operational teams during humanitarian and evacuation challenges (for instance, staffing coordination hubs for assistance). Infrastructure recovery projects will gain access to coordinators, engineers, and project managers without delays caused by lengthy competitive procedures.

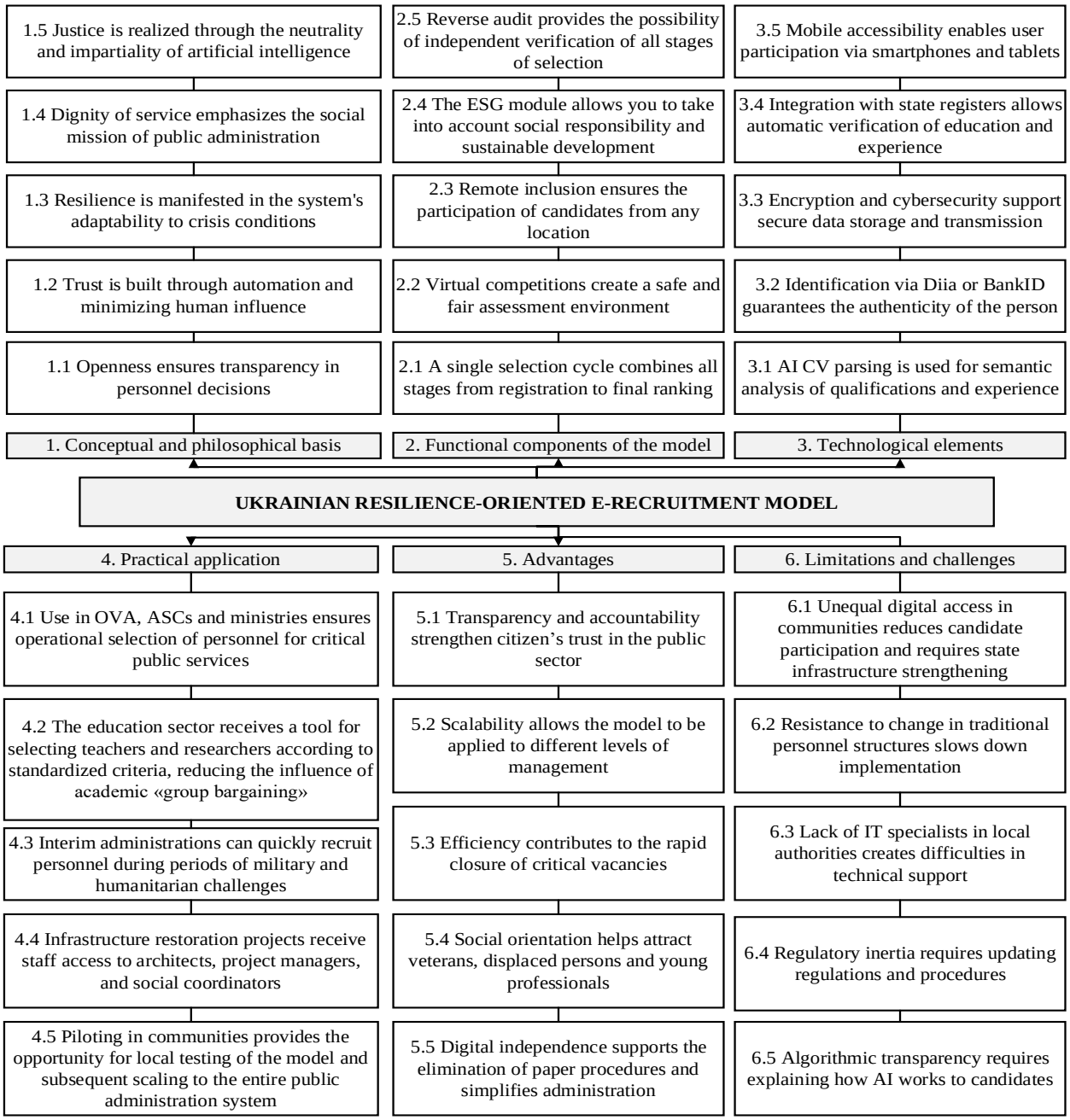

Figure 7. Ukrainian Resilience-Oriented e-Recruitment Synergistic Model

**Source: own study*

The strategic advantages of the «Ukrainian Resilience-Oriented e-Recruitment Model» will be reflected in increased transparency of the public sector and reduced corruption risks due to the reproducible and verifiable logic of competition decisions. The scalability of the model will allow competitions to be conducted simultaneously in different regions under unified rules, ensuring

stable personnel management. Operational efficiency will support the rapid filling of key positions during periods of crisis pressure. Its social orientation will create pathways for integrating veterans, internally displaced persons, and young specialists into public service, while the elimination of paper-based procedures will reduce administrative burden and simplify documentation workflows.

The risks of the «Ukrainian Resilience-Oriented e-Recruitment Model» will be associated with uneven digital accessibility across communities during the post-war recovery period, institutional resistance from traditional HR structures, and the need to explain the principles of algorithmic evaluation in order to ensure acceptance and trust. Regulatory modernization will require adapting the legal framework to algorithmic decision-making in the public sector and defining responsible bodies for auditing and supporting the model.

The final next step will be the formation of a matrix of challenges that the «Ukrainian Resilience-Oriented e-Recruitment Model» will address in the field of public administration, see Table 2.

The next final step will be the development of a matrix of challenges that the «Ukrainian Resilience-Oriented e-Recruitment Model» will address in the field of public administration, see Table 2.

Based on the data in Table 2, the presented challenge matrix of the «Ukrainian Resilience-Oriented e-Recruitment Model» is aimed at aligning key challenges of public administration with specific functional mechanisms of the model, therefore each element has a clearly defined target action and a measurable effect. For example, the structural shortage of personnel in the regions will be compensated through remote participation and virtual competitions, which will eliminate dependence on physical mobility and expand the national talent pool, including de-occupied, frontline, and relocated communities. The problem of distrust in competitive selection outcomes will be addressed through transparent audit and digital action logs, where each stage of the recruitment process is systemically verified, ensuring stability and predictability of personnel decisions regardless of changes in commission composition or political environment. A central role will be played by «Diia» and «BankID» digital identification mechanisms, which remove the need for physical presence and standardize identity verification. This creates the possibility for rapid competitions in situations of increased workload, where personnel decisions must be made without delay. Integration with state registers through «Trembita» enables automatic verification of education, employment history, and military status, which increases institutional integrity of recruitment procedures and reduces the risk of intentional document fraud. The use of AI-based resume parsing will establish equal conditions for all candidates, since the assessment of competency fit will no longer depend on self-presentation style or access to advisory resources.

Under increasing pressure on the state's personnel system, the model will enable simultaneous recruitment competitions across multiple regions while preserving standardized criteria, ensuring that all selection stages become reproducible and scalable. The social orientation of the ESG-module will allow selection not only based on formal qualifications, but also on the candidate's readiness to work in conditions of post-war recovery and high public responsibility, which is critical during reconstruction. The policy of algorithmic explainability will ensure that the system's decision-making logic is transparent, reducing risks of distrust in automated evaluation and promoting acceptance of new personnel governance standards as a societal norm.

Thus, the developed challenge matrix of the «Ukrainian Resilience-Oriented e-Recruitment Model» additionally serves as a strategic foundation for forming the institutional basis of future regulatory changes in the field of public recruitment. Its implementation will form the basis for the development of a new law on digital recruitment in the public sector and for the establishment of regulatory mechanisms for auditing algorithmic decision-making, which will formalize the transition of the state toward predictable, transparent, and socially responsible personnel practices.

Table 2

Challenges that the «Ukrainian Resilience-Oriented e-Recruitment Model» in context public administration

№	Structural challenge	Challenges characteristics	Model component	Implementation mechanism	Expected systemic effect
1	Regional staff shortages	Loss of specialists and migration	Remote inclusion and virtual competitions that will guarantee equal access to participation regardless of the candidate's location	Video interviews and online tests with proctoring	Expanding the talent pool and the ability to attract specialists from remote and restored areas
2	Doubts about transparency	Distrust of commission decisions	Reverse audit and digital action log as a mechanism for proving the logic of the decision made	Full event log and public viewing of stories	Legitimacy of results and reducing the space for informal influence
3	Candidate identification	Risk of person substitution	«Diia» and «BankID» identification module with identity confirmation in a digital environment	Remote identity verification and KYC checks	Reliability of profiles and eliminating fraudulent applications
4	Education and experience verification	Heterogeneity of documents	Trembita integration gateway for automatic verification of registry data	Inquiries to the EDEBO and the registers of the Ministry of Justice and military records	Automatic verification of qualification level without human intervention
5	Quality of assessment	Different resume formats	AI-parsing of resumes with semantic analysis of competencies and relevance	Competence matching with the position profile	Fair ranking of candidates according to meaningful criteria
6	Data protection	Vulnerability of communication channels	Encryption module and control of access roles to the HRM platform	TLS and role rights in the HRM platform	Integrity and confidentiality of personal data and competition results
7	Unequal digital access	Limited community capabilities	Mobile participation via smartphones and tablets with an optimized interface	Portal and application from a smartphone and tablet	Reducing barriers to entry and attracting candidates from small communities
8	Need for rapid scaling	Peak loads during crises	A single digital recruitment cycle with a centralized and reproducible algorithm	Parallel competitions in the regions and automatic formation of the reserve	Continuity of staffing even with changes in workload
9	Risk of manual interventions	Informal influence at stages	Automated procedural rules without the possibility of changing stages manually	Fixed rules and KPI dashboards	Reducing corruption risks and eliminating informal influence
10	Social relevance of staff	High tension and need for service	ESG-module for assessing motivation, civic position and readiness for recovery	Assessment of motivation and readiness for reconstruction	Resilience and social cohesion of teams in the public sector
11	Explainability of algorithms	Perception of AI as a black box	Explainable-AI policy with open logic of evaluation criteria	Explained criteria and reports on the model	Transparency of decision logic and increasing candidate trust
12	Compliance with the law	Regulatory restrictions	Normative compliance block with NADS regulations and AI audit procedures	DPA and DPIA, typical regulations of the National Agency for the Protection of Personal Data	Legal consistency and the possibility of official scaling of the model

**Source: own study*

CONCLUSION

Summarizing the results of this study, a comprehensive analysis of existing models of digitalizing recruitment processes in the public sector was conducted, which made it possible to identify their characteristics, advantages, and limitations. The comparative analysis demonstrated that current approaches focus either on technological security, or on socio-environmental criteria, or on analytical objectivity; however, none of the models fully covers all aspects of sustainable development and operational continuity of public-sector recruitment. Based on the synthesis of these approaches, a new «Ukrainian Resilience-Oriented e-Recruitment Model» has been proposed, which integrates the best principles of previous models and is adapted to the challenges of the Ukrainian context. The implementation of the «Ukrainian Resilience-Oriented e-Recruitment Model» will establish a regulatory and institutional foundation for «digital recruitment», introducing new standards of verifiability, reproducibility, and equality of conditions for all participants. The practical application of the model has the potential to transform the public recruitment system by ensuring continuity of personnel processes during periods of military and humanitarian challenges and by increasing citizen's trust in the public sector. In particular, the introduction of the model will serve as a basis for the development of legal acts regulating digital recruitment and the auditing of algorithmic decisions. Prospects for further research will involve piloting the model in real implementation projects and improving its components. In particular, it will be necessary to study the adaptation of the «Ukrainian Resilience-Oriented e-Recruitment Model» in an actual interagency environment, evaluate its impact on recruitment effectiveness, and develop regulatory mechanisms governing algorithmic processes in public HR systems. This comprehensive approach will contribute to further digital transformation of personnel practices and strengthen the resilience of the public administration system as a whole.

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МОДЕЛІ ЦИФРОВІЗАЦІЇ ПРОЦЕСІВ РЕКРУТИНГУ У СИСТЕМІ ПУБЛІЧНОГО УПРАВЛІННЯ: КОНЦЕПТУАЛЬНО-ФІЛОСОФСЬКІ ТА ПРИКЛАДНІ АСПЕКТИ

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Цифровізація процесів рекрутингу стає ключовим чинником трансформації публічного управління, змінюючи підходи до відбору кадрів і забезпечення ефективності державної служби. У контексті воєнних і післявоєнних викликів для України актуально є створення стійкої цифрової моделі, здатної забезпечити рівний доступ, прозорість і довіру у процесі державного добору. Метою даного дослідження є узагальнення провідних зарубіжних моделей цифрового рекрутингу та розробка інтегрованої концепції «Ukrainian Resilience-Oriented e-Recruitment Model», що поєднує технологічні, процедурні, етичні й соціальні принципи для підвищення ефективності публічних кадрових процесів. Методологіє дослідження є застосування порівняльно-аналітичного підходу до сучасних моделей цифрового рекрутингу зарубіжних експертів. Додатково використано методи системного аналізу, моделювання, дедукції, узагальнення, а також нормативно-правовий аналіз чинної правової бази України, що дозволило створити синергетичну модель, адаптованого цифрового рекрутингу до українських інституційних умов. Результатами дослідження стало виявлення, того що наявні моделі зосереджуються на окремих аспектах, зокрема у технічній безпеці, сталому розвитку, алгоритмічній нейтральності або аналітичній типології. У відповідь на це була розроблено «Ukrainian Resilience-Oriented e-Recruitment Model», що дозволить забезпечити відтворюваність конкурсів у різних регіонах, дистанційно перевіряти

освіту та досвід кандидатів, уникає суб'єктивних оцінок і створить умови для рівного доступу громадян, включаючи ветеранів, ВПО і молодих фахівців, а її структурна логіка передбачатиме взаємодію з державними реєстрами, AI-парсингом резюме та ESG-модулями оцінки мотивацій і ціннісної орієнтації кандидатів. Практична значимість дослідження постає в тому, що «Ukrainian Resilience-Oriented e-Recruitment Model» має потенціал трансформації цифрового рекрутингу в відкриту кадрову екосистеми України в контексті публічного управління.

Ключові слова: цифровий рекрутинг у публічному управлінні, алгоритмічна оцінка кандидатів, HR-платформи, штучний інтелект, стійка модель цифрового рекрутингу.