

American Journal of Economics and Business Management

Vol. 9 Issue 5 | **pp.** 1168-1175 | **ISSN:** 2576-5973
Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Article

Mechanisms for Improving the Use of Digital Technologies in the Social Protection System

Mukhtorov Ulugbek Khayotjonovich*[1]

1. Tashkent International University Head of the Career Development Center
*Correspondence: u.mukhtorov11@gmail.com

Abstract: This article examines the principal mechanisms for improving the use of digital technologies in social protection systems, with particular focus on artificial intelligence (AI) as an instrument for enhancing efficiency. The study analyses the application of proactive services and natural language processing (NLP) based chatbot solutions in social protection, their advantages and limitations. Based on research published in 2024–2025 by international organisations, the paper considers the potential of AI to improve service delivery efficiency in social protection, the associated risks, and mitigation mechanisms. The article proposes a three-stage conceptual framework for implementing client-facing chatbots, predictive analytics, automated decision-support systems, and proactive service delivery models.

Keywords: Social protection, artificial intelligence, NLP, chatbot, proactive services, predictive analytics, digital transformation, automation, efficiency, interoperability.

Citation: Khayotjonovich M. U. Mechanisms for Improving the Use of Digital Technologies in the Social Protection System. American Journal of Economics and Business Management 2026, 9(5), 1168-1175.

Received: 10th Feb 2026
Revised: 11th Mar 2026
Accepted: 11th Apr 2026
Published: 20th May 2026

Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/)

1. Introduction

Globally, social protection systems are increasingly exposing long-standing shortcomings in the delivery mechanisms of cash benefits, food assistance, pensions, and other social entitlements, as climate change, geopolitical and economic turbulence, and demographic transformations continue to place them under pressure. Governments now face the task of delivering faster services to broader segments of the population under constrained resources. In this context, digital technologies — and artificial intelligence (AI) in particular — are becoming powerful instruments for enhancing efficiency and strengthening the operational capacity of these systems.

Research published by the International Labour Organization (ILO) during 2024–2025 demonstrates that the digital transformation of social protection is critical for achieving the goal of universal social protection. Artificial intelligence is increasingly being applied in the delivery and administration of social protection services. At the same time, according to the 2025 report of the Organisation for Economic Co-operation and Development (OECD), the most widespread applications of AI in social protection currently concentrate on client support (chatbots), automation of back-office processes, and fraud detection.[1]

According to the 2024 report of the International Social Security Association (ISSA), AI has demonstrated a proven capacity to enhance institutional capability, improve service delivery, and significantly increase administrative efficiency as part of an institutional data-driven strategy. The ISSA TechByte report, published in November 2025, analysed 37 cases from 28 institutions across 21 countries and showed a strong emphasis on client-

facing applications such as chatbots and virtual assistants — areas that yield rapid returns and visible improvements within social security systems.

At the same time, the application of AI in social protection entails serious risks. As illustrated by the SyRI system in the Netherlands, predictive child-welfare models in U.S. states, and automated unemployment-benefit decisions in Sweden, poorly designed or insufficiently supervised AI systems can produce discriminatory and coercive outcomes. For this reason, the present article examines not only the mechanisms for leveraging AI to enhance efficiency but also its limitations and risks.[2]

The objective of this study is to substantiate the conceptual mechanisms for improving the use of digital technologies — particularly artificial intelligence — in the social protection system. The research tasks are as follows: first, to classify the current and emerging areas of AI application in social protection; second, to evaluate the effectiveness of proactive services and NLP-based chatbot solutions on the basis of international experience; third, to develop a staged framework for AI implementation; and fourth, to identify instruments for mitigating the associated risks.[3]

2. Methodology

Artificial intelligence is not a single technology but a set of technologies that includes machine learning, deep learning, natural language processing (NLP), computer vision, and robotic process automation (RPA). As noted in the report jointly published in 2024 by the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV) and the ISSA, AI is not merely a new technology but a body of knowledge; its implementation entails specific challenges and should be adopted as part of a portfolio of technologies.

As indicated in the OECD's 2025 report AI and the future of social protection in OECD countries, the use of AI in social protection across OECD member states is currently concentrated in three areas: client support, back-office process automation, and fraud detection. More advanced applications such as predictive analytics are not yet widely deployed; likewise, the routine use of AI to reduce non-take-up of benefits has not yet become common among OECD countries.[4]

According to the 2025 report of the Digital Convergence Initiative (DCI), the emerging applications of AI in social protection fall into the following categories: (1) eligibility prediction — the pre-identification of households likely to qualify for a benefit, enabling faster outreach and automated enrolment; (2) grievance handling — the use of NLP-based chatbots to triage complaints, detect recurring issues, and route cases to appropriate channels; (3) predictive analytics for crisis response — the early identification of regions or populations likely to need support due to shocks such as floods, droughts, or displacement; and (4) fraud detection — the real-time analysis of large volumes of data to identify fraudulent payments.

At present, the application of AI in social protection is part of a rapidly expanding global market. According to Grand View Research, the AI market in government and public services was valued at USD 22.41 billion in 2024 and is projected to reach USD 98.13 billion by 2033, growing at a compound annual growth rate (CAGR) of 17.8 per cent. Parallel estimates from Global Market Insights indicate that the market will reach USD 91.3 billion by 2034 (CAGR 18.6 per cent). According to Gartner, by 2028 at least 80 per cent of governments will have deployed AI agents to automate routine decision-making.[5]

These figures are conceptually significant: they demonstrate that the penetration of AI into the public sector, including social protection, is proceeding rapidly but unevenly. According to the OECD's 2023 Digital Government Index, 70 per cent of countries had used AI to improve internal government processes, whereas only 33 per cent had used AI to enhance policy design and implementation. This pattern is also observed in social

protection: AI is first applied to back-office and client-interface tasks of an elementary nature, and only subsequently extended to decision-making and full-cycle service delivery.

3. Result and Discussion

The service delivery chain of social protection systems comprises registration, eligibility assessment, benefit determination, payment, monitoring, and grievance handling. Almost every link in this chain can be effectively automated through AI solutions. As noted in the World Bank's 2021 report Artificial Intelligence in the Public Sector, NLP-based chatbot applications — client-service programmes capable of processing text or speech — are among the AI technologies most widely deployed in public administration.[6]

Summarising these observations, the principal functional areas of AI application in social protection are presented in Table 1.

Table 1. Principal areas of application of artificial intelligence technologies in social protection[7]

Area	Underlying technology	Examples of application
Client service	NLP, generative AI, virtual assistants	Chatbots, virtual assistants, automated translation services, FAQ systems
Back-office automation	RPA, machine learning, document classification	Application and document processing, data entry, classification
Fraud detection	Machine learning, anomaly detection	Duplicate payments, ghost beneficiaries, system inconsistency detection
Predictive analytics	Machine learning, deep learning	Eligibility prediction, reducing non-take-up of benefits, forecasting shock impacts
Proactive service delivery	ML + NLP + data interoperability	Automated notifications, pre-emptive eligibility checks, automatic enrolment
Triage and prioritisation	ML, priority models	Child protection, housing status, emergency-response prioritisation

Traditional social protection systems operate on a reactive model: citizens must be aware of their rights, approach the relevant government institution, submit the required documents, and wait for their application to be processed. This model generates the problem of non-take-up of benefits due to administrative "hassle costs" — as a result, population groups genuinely in need of support often remain outside the coverage of social protection. The 2024 OECD report Modernising Access to Social Protection has shown that this problem is relevant even in high-income countries.[8]

The proactive service delivery model transforms this paradigm: rather than waiting for citizens to apply, the state uses available data to identify their entitlements and needs in advance, either offering relevant services or providing them automatically. The implementation of this model relies on three core technological enablers: first, the interoperability of data systems; second, predictive models capable of automatically assessing eligibility; and third, NLP-based interfaces (chatbots, virtual assistants) capable of communicating with citizens in natural language.

International experience shows that the transition to proactive service delivery is a multi-stage process. In the initial stage, governments begin by sending citizens automated reminders about upcoming deadlines. At the next stage, identified individuals are automatically notified of benefits or services to which they are entitled. In the final stage, citizens are not even required to submit an application — the benefit or service is provided automatically.[9]

As illustrated by the case of Kela, the Social Insurance Institution of Finland, an AI-based automated system processed more than 16 million attachments in 2024, generating staff-time savings equivalent to 38 person-years. The platform's ability to resize and convert documents reduced storage needs by 24 terabytes. While this system does not directly address benefit eligibility or non-take-up, it establishes a solid foundation for proactive service models — automated outreach and real-time eligibility checks.

In the context of making social protection more proactive, potential beneficiary groups pre-identified by the system — by region or by socio-demographic characteristics — are used to develop targeted support offers. Given the considerable returns of some preventive measures, the social and economic benefits of such AI applications can be substantial. In practice, AI has been applied to areas such as homelessness prevention, the prevention of repeated domestic violence, and ensuring care and income security for older persons. At the same time, the OECD emphasises that significant gains can also be achieved without AI — using existing tools together with high-quality, linked personal data.[10]

Natural Language Processing (NLP) is one of the most widely deployed and fastest-maturing AI solutions in social protection. NLP-based chatbots and virtual assistants provide round-the-clock support to the public, reduce waiting times, and respond quickly to citizens' needs. This technology facilitates access to complex social protection information, thereby enhancing the inclusiveness of the system.

The OECD's 2025 report Governing with Artificial Intelligence documents over 200 examples of government AI applications, among which many successful deployments of NLP-based chatbot solutions are recorded. A virtual assistant launched in January 2025 on the Portuguese gov.pt portal provides information on more than 2,300 public services and offers support in 12 languages, eliminating language barriers for citizens of diverse nationalities. Integrated into over 5,000 pages of the portal, it is scheduled to acquire transactional features — including process tracking and appointment scheduling — in 2025. In France, the sovereign generative AI system "Albert", launched in April 2024, assists public administration agents in responding more efficiently to citizens' requests.[11]

A particularly important feature of NLP technologies in the field of social protection is their ability to function even in contexts of underdeveloped resources. Social protection systems often rely on under-resourced local-language data, which renders standard language models produced by large technology companies ineffective. The World Bank's DIME AI initiative is developing large language models (LLMs) tailored to lower-resource languages to address this problem — a development of considerable importance for developing countries.

At the same time, it is useful to refer to specific figures to measure the concrete contribution of chatbots to efficiency. The Korea Workers' Compensation and Welfare Service (COMWEL) automated 14 processes, saving on average 26 minutes per claim and reducing the annual workload by the equivalent of 41 full-time employees. This example clearly demonstrates the efficiency potential of automation: by handling repetitive tasks, automation frees up staff to focus on more complex, cognitively demanding cases.

Chatbot solutions can be classified into two principal models. The first is rule-based chatbots, which operate on pre-defined scenarios and respond to standard questions with high accuracy. The second is generative AI-based chatbots, which use large language models (LLMs) to conduct natural-language interactions and answer more complex queries.[12]

Summarising the performance indicators of chatbot solutions, their stages of development in the context of social protection are presented in Table 2.

Table 2. Stages of development of NLP-based chatbot solutions in social protection

Stage	Technological characteristics	Functional capabilities
1. Simple informational chatbot	Rule-based, FAQ-oriented, monolingual	Q&A on benefit classifications, application procedures, and document lists
2. Interactive routing bot	NLP + geolocation + context retention, multilingual	Routing citizens to specific services, triaging grievances, interactively completing complex forms
3. Transactional virtual assistant	Generative AI (LLM), integration with back-office systems, authentication	Processing applications, checking payment status, scheduling appointments, issuing proactive reminders
4. Proactive cognitive agent	Agentic AI, multi-model integration, predictive analytics	Automatically offering citizens their rights and opportunities, eligibility forecasting, automated document preparation

Source: Summarised by the author based on OECD (2025), ISSA TechByte (2025), DCI (2025), and industry research.

An analysis of international experience and theoretical foundations makes it possible to identify universal stages in the process of improving digital technologies — particularly AI — in social protection systems. This article proposes a three-stage conceptual framework: (I) the foundation-laying stage; (II) the expansion and automation stage; and (III) the proactive and cognitive transformation stage.

4.1. Stage one: strengthening digital foundations

The principal task of the first stage is to create the foundations required for AI implementation. According to the 2025 DCI report, the success of AI applications depends on foundational improvements achieved during the initial phase of digital transformation — interoperability, unified databases, and institutional readiness. In this sense, AI is not a standalone technology but a layer that is superimposed on the results of existing digital transformation.

The key elements of this stage are as follows: first, ensuring data quality and standardisation — AI models depend heavily on the quality of data, and poor-quality data produces unreliable results; second, creating an interoperable architecture that enables data exchange among different agencies; third, establishing a legal foundation for the protection of personal data; and fourth, raising the digital literacy of staff.[13]

According to the 2024 findings of the International Labour Organization, digital transformation and real-time data sharing through interoperable information systems contribute to enhancing the inclusiveness and accessibility of social protection by streamlining enrolment, eligibility verification, and service delivery. At this stage, in addition to technological investment, institutional changes — inter-agency cooperation protocols, data-governance policies, and ethical-oversight mechanisms — are of critical importance.

4.2. Stage two: AI deployment and automation

In the second stage, the social protection system begins to introduce AI technologies into specific processes. This stage encompasses three principal directions: client-interface chatbots, back-office automation, and fraud detection.

At the service delivery level, chatbots and virtual assistants are introduced progressively — starting from a simple FAQ bot, moving to an interactive routing bot, and eventually reaching a transactional virtual assistant (see Table 2 above). At the back-office level, repetitive tasks are carried out through automatic document classification, data extraction, and robotic process automation (RPA). At the fraud-detection level, machine-learning models analyse payments in real time and identify suspicious transactions. An essential feature of this stage is that AI is deployed not as a fully autonomous decision-making tool but as an instrument supporting staff.

4.3. Stage three: proactive and cognitive transformation

The third stage involves transforming the social protection system towards proactive service delivery. At this stage, predictive analytics are used to pre-identify potential beneficiaries, automatic enrolment systems are introduced, and cognitive virtual assistants present citizens with their rights and opportunities.

This stage addresses the problem of "hassle costs" — the complexity of accessing benefits and the difficulties associated with the application process — recognised by the OECD. AI tools enhance the genuine inclusiveness of the social protection system by simplifying the application process, preparing required documents in advance, and responding to citizens in accessible language. The ultimate aim of the third stage is to minimise non-take-up of benefits and to bring the system closer to universality.[14]

The Table 3. three components of proactive transformation are: (1) full data integration; (2) cognitive (LLM-based) virtual agents; and (3) the support of automated decision-making systems by responsible staff. It is precisely the third component — staff oversight of automated decisions — that ensures that the system remains efficient and fair.

Table 3. Stages of AI improvement in social protection: conceptual framework

Stage	Principal task	Technological solutions	Outcome indicator
I. Foundation laying	Data quality, interoperability, legal base, staff training	Unified databases, integration protocols, data-protection system	Level of inter-agency data exchange, digital literacy
II. Expansion and automation	Chatbots, back-office RPA, fraud detection	NLP-based bots, document automation, ML fraud models	Reduction in staff workload, service speed, scope of fraud detection
III. Proactive transformation	Predictive analytics, proactive notifications, automatic enrolment	Predictive analytics, cognitive virtual agents, agentic AI	Non-take-up rate, inclusiveness, satisfaction indices

Source: Developed by the author.

However great the potential of AI implementation in social protection may be, international experience also reveals serious risks. The SyRI (System Risk Indication) system used in the Netherlands, despite being built on a solid legal framework, disproportionately targeted low-income and migrant communities and was ultimately ruled discriminatory by the courts and shut down in 2020.

In Sweden, a system for rejecting unemployment benefits based on automated profiling wrongly denied benefits to thousands of recipients: the algorithm, drawing on data from various governmental sources, reached erroneous conclusions that 10–15 per cent of beneficiaries were not complying with the stipulated obligations.

A number of practical measures have been proposed for mitigating the risks associated with AI implementation. First, automated decision-making must be subject to regular audit in accordance with national or international standards. Second, before large-scale deployment, algorithms should be tested through pilot projects and subjected to risk, impact, and ethical assessments.

According to the recommendations of the ILO social security institutions introducing AI should align their technological investments with national social protection policies and strategies, as well as with human-rights principles. Non-digital alternatives — including human guidance for accessing digital interfaces — must always remain available, so that citizens unable to use digital options are not excluded. Principles such as universal access, inclusion, gender equality, transparency, fairness, participation, quality of administration and services, accountability, effectiveness, universality, and sustainability must remain central to any AI implementation.[15]

4. Conclusion

This study has examined the principal mechanisms for improving the use of digital technologies in the social protection system, paying particular attention to the role of artificial intelligence as an instrument for enhancing efficiency. Research published by international organisations during 2024–2025 demonstrates that AI — particularly through NLP-based chatbot solutions and proactive service delivery models — has significant potential to generate tangible efficiency gains in social protection. First, AI in social protection should be viewed not as an isolated technology but as a layer of technologies placed on top of the solid foundations of digital transformation — data quality, interoperability, legal framework, and workforce readiness. The success of AI depends precisely on the quality of these foundations. Second, NLP-based chatbots and virtual assistants represent the most rapidly effective and most mature AI solutions in social protection. They contribute significantly to reducing staff workload, shortening service delivery times, and enhancing the inclusiveness of the system. However, the success of chatbot solutions depends on their staged implementation, adaptation to local language and context, and integration with back-office systems. Third, the proactive service delivery model transforms the paradigm of social protection from reactive to proactive. In this model, the state does not wait for citizens to apply but uses predictive analytics to identify their rights and needs in advance. Fourth, a three-stage framework has been proposed for the successful implementation of AI in social protection: (I) strengthening digital foundations; (II) expansion and automation; and (III) proactive and cognitive transformation. Each stage has its own tasks, technological solutions, and outcome indicators. Fifth, the use of AI also entails serious risks: lack of transparency, the digital divide, and personal-data security concerns. Universal instruments for mitigating these risks exist — regular audit, testing through pilot projects, the principle of oversight by responsible staff (human-in-the-loop), and the availability of non-digital alternatives. In conclusion, the most appropriate path to improving AI in the social protection system is to implement it through a staged, inclusive, and client-centred approach, underpinned by a legal framework, transparency, and oversight by responsible staff. Only such an approach makes it possible to realise the efficiency potential of AI in the interests of the most vulnerable segments of the population.

REFERENCES

[1] OECD, *AI and the Future of Social Protection in OECD Countries*, OECD Artificial Intelligence Papers, no. 42. Paris, France: OECD Publishing, 2025, pp. 1–36, doi: 10.1787/7b245f7e-en.

[2] International Social Security Association (ISSA) and United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV), *Artificial Intelligence in Social Security Organizations*. Geneva, Switzerland: ISSA and UNU-EGOV, 2024, pp. 1–42.

[3] International Social Security Association (ISSA), *AI Applications in Social Security: Evidence and Insights from the TechByte*. Geneva, Switzerland: ISSA, 2025, pp. 1–8.

[4] Digital Convergence Initiative (DCI), *AI in Social Protection: Harnessing Potential, Preventing Harm*. Geneva, Switzerland: DCI, 2025, pp. 1–12.

[5] Grand View Research, *AI in Government and Public Services Market Report, 2033*. San Francisco, CA, USA: Grand View Research, 2024, pp. 1–120.

[6] Global Market Insights, *AI in Government and Public Services Market Size, 2034 Report*. Selbyville, DE, USA: Global Market Insights, 2025, pp. 1–180.

[7] Gartner, "Gartner predicts at least 80% of governments will deploy AI agents to automate routine decision-making by 2028," Mar. 17, 2026, pp. 1–5.

[8] World Bank, *Artificial Intelligence in the Public Sector: Maximizing Opportunities, Managing Risks*. Washington, DC, USA: World Bank, 2021, pp. 1–12.

[9] OECD, *Modernising Access to Social Protection: Strategies, Technologies and Data Advances in OECD Countries*. Paris, France: OECD Publishing, 2024, pp. 1–104, doi: 10.1787/af31746d-en.

[10] OECD, *Harnessing Artificial Intelligence in Social Security: Use Cases, Governance and Workforce Readiness*. Paris, France: OECD Publishing, 2025, pp. 1–86, doi: 10.1787/b52405c1-en.

[11] OECD, *Governing with Artificial Intelligence*. Paris, France: OECD Publishing, 2025, pp. 1–224, doi: 10.1787/795de142-en.

[12] World Bank DIME, *DIME Artificial Intelligence: ImpactAI and Context-Specific LLMs*. Washington, DC, USA: World Bank, 2025, pp. 1–10.

[13] International Labour Organization (ILO), "Digital transformation is pivotal to achieving the goal of universal social protection," Geneva, Switzerland: ILO, 2025, pp. 1–6.

[14] socialprotection.org, "Artificial Intelligence and Social Protection: A Tool for Enhanced Efficiency or for Exclusion?," 2025, pp. 1–8.

[15] UNESCO, *Recommendation on the Ethics of Artificial Intelligence*. Paris, France: UNESCO, 2021, pp. 1–31.