

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE AS COMPLEMENTARY FORCES: A COMPARATIVE STUDY OF WORKFORCE TRANSFORMATION IN UZBEKISTAN AND SOUTH KOREA

Muslima M Sodikova

*Management specialization in Economics Tashkent University of Information Technologies named after Muhammad al-Khwarizmi Tashkent, Uzbekistan
muslimasodiqova5@gmail.com*

Abstract: *Artificial intelligence and data science are often discussed through the lens of job replacement, yet their relationship is more accurately understood as complementary. This article examines how artificial intelligence supports data science by automating repetitive tasks, improving analytical speed, assisting predictive modeling, and enabling data professionals to focus on interpretation, decision-making, and strategic problem-solving. The study compares Uzbekistan and South Korea to show how this relationship develops in two different economic and technological contexts. Uzbekistan is analyzed as an emerging digital economy where demand for data-related skills is gradually increasing across sectors such as finance, telecommunications, education, public administration, and business services. South Korea is examined as a technologically advanced economy with stronger digital infrastructure, broader AI adoption, and a more mature labor market for data science and artificial intelligence specialists. Using a comparative analytical approach based on secondary data, academic literature, policy reports, and labor market indicators, the article explores how AI integration transforms the role of data scientists rather than eliminating it. The findings suggest that AI reduces the time spent on technical and repetitive processes, while increasing the importance of human skills such as critical thinking, domain knowledge, ethical judgment, and business interpretation. The article concludes that the future of data science depends not on competition between humans and AI, but on the ability of professionals, universities, companies, and governments to build AI-supported data competencies.*

Keywords: *Artificial Intelligence, Data Science, Workforce Transformation, AI Integration, Labor Market Demand, Data Scientists, Uzbekistan, South Korea, Digital Economy, AI Augmentation.*

INTRODUCTION

In recent years, artificial intelligence and data science have become two of the most influential forces shaping the modern digital economy. Both fields are closely connected with the way organizations collect, process, analyze, and use information for decision-making. Artificial intelligence refers to computer systems that are able to perform tasks that normally require human intelligence, such as learning from data, recognizing patterns, generating predictions, processing language, and supporting automated decisions. Data science, on the other hand, is an interdisciplinary field that combines statistics, programming, mathematics, machine learning, data visualization,

and domain knowledge to extract meaningful insights from structured and unstructured data. Although these two fields are sometimes discussed separately, in practice they increasingly operate together. Data science provides the data, analytical methods, and problem-solving framework, while artificial intelligence strengthens this process by improving speed, automation, prediction, and scalability.

At the same time, the rapid development of artificial intelligence has created uncertainty in many professional fields. One of the most common concerns is that AI may replace human workers, including data scientists and data analysts. This concern is understandable because many AI tools can now write code, clean data, generate visualizations, summarize reports, build machine learning models, and assist with technical tasks that previously required human effort. However, viewing AI only as a threat gives an incomplete picture of its role in the data science profession. In reality, AI does not remove the need for data scientists; rather, it changes the nature of their work. Instead of spending most of their time on repetitive and technical tasks, data professionals can use AI tools to work more efficiently and focus on higher-level activities such as understanding business problems, selecting appropriate analytical methods, evaluating model reliability, interpreting results, ensuring ethical use of data, and communicating insights to decision-makers.

This article is based on the argument that artificial intelligence and data science should be understood as complementary forces rather than competing fields. AI can automate some parts of the data science workflow, but it cannot fully replace the human judgment required to define research questions, understand context, evaluate data quality, interpret complex outcomes, and make responsible decisions. For example, an AI system may suggest a model or generate a prediction, but a data scientist must still decide whether the data is reliable, whether the model is appropriate, whether the result is biased, and how the insight can be used in a real organizational or social context. Therefore, the future of data science is not simply about machines replacing humans. It is about professionals learning how to work with intelligent technologies and using them as tools for productivity, accuracy, and innovation.

The importance of this topic is especially clear in the context of workforce transformation. Around the world, companies, governments, educational institutions, and technology sectors are increasingly relying on data-driven decision-making. As a result, demand is growing for specialists who can analyze data, build predictive models, work with machine learning tools, and translate data into practical solutions. However, this demand does not develop equally in every country. Some countries already have advanced digital infrastructure, mature technology industries, and strong AI ecosystems, while others are still developing their digital economy, improving educational programs, and building labor market readiness for data-related professions. For this reason, a comparative approach is useful for understanding how AI and data science influence workforce development in different national contexts.

This study focuses on Uzbekistan and South Korea as two contrasting but meaningful cases. Uzbekistan represents a developing digital economy where interest in

information technology, artificial intelligence, data analytics, and digital transformation has been increasing in recent years. The country is gradually expanding its IT sector, digital government services, startup ecosystem, fintech development, and educational initiatives related to programming and data skills. In this context, data science is still an emerging professional field, but its importance is growing as organizations begin to recognize the value of data for business efficiency, customer analysis, forecasting, risk management, and public service improvement. For Uzbekistan, the integration of AI into data science can become an opportunity to accelerate professional development, increase productivity, and reduce the gap between local specialists and global digital labor market standards.

South Korea, by contrast, represents a technologically advanced economy with strong digital infrastructure, high innovation capacity, and a more mature technology-driven labor market. The country has developed advanced industries in electronics, manufacturing, telecommunications, robotics, smart cities, digital platforms, and artificial intelligence. In such an environment, data science is not only an emerging skill but a key part of industrial competitiveness and innovation. South Korea's experience is important because it shows how AI and data science can be integrated into advanced sectors and how the demand for data-related professionals changes when digital transformation becomes deeply embedded in the economy. At the same time, even in a developed country like South Korea, AI creates new challenges, including the need for reskilling, ethical governance, responsible automation, and continuous adaptation of the workforce.

By comparing Uzbekistan and South Korea, this article aims to show that AI integration in data science depends on the level of digital development, labor market maturity, educational readiness, and national innovation capacity. In South Korea, the discussion is more focused on advanced AI adoption, automation, and high-level digital skills. In Uzbekistan, the focus is more on building foundational data science competencies, increasing the number of qualified specialists, and preparing the labor market for wider use of AI-supported analytics. Despite these differences, both countries demonstrate the same general trend: the role of data professionals is becoming more important, not less important. As more sectors use data and AI systems, the need for specialists who can understand, manage, interpret, and ethically apply these technologies continues to increase.

The main purpose of this article is to analyze how artificial intelligence and data science work together to transform the labor market, improve work efficiency, and reshape the professional role of data scientists. The article explains the relationship between AI and data science, discusses how AI can be integrated into different stages of the data science workflow, and examines how demand for data-related skills is developing in Uzbekistan and South Korea. Using a comparative and analytical approach, the study seeks to provide a clear and accessible understanding of why AI should not be seen only as a job replacement threat. Instead, AI should be viewed as a

productivity-enhancing partner that allows data scientists to work faster, smarter, and more strategically.

The article is structured as follows. The literature review discusses existing academic and professional perspectives on artificial intelligence, data science, labor market transformation, and AI-driven productivity. The methodology section explains the comparative and secondary data-based research approach used in the study. The results and discussion section analyzes the integration of AI into data science work and compares labor market trends in Uzbekistan and South Korea. Finally, the conclusion and suggestions section summarizes the main findings and provides recommendations for students, universities, companies, and policymakers seeking to develop AI-supported data science competencies in the future workforce.

Literature Review

The relationship between artificial intelligence and data science has become one of the most important discussions in the modern digital economy. In many industries, data is no longer used only for reporting past performance; it is increasingly used for prediction, automation, customer understanding, risk management, innovation, and strategic decision-making. This change has made data science a central professional field for organizations that want to compete in data-driven markets. At the same time, artificial intelligence has become a powerful technological layer that strengthens the practical value of data science. While data science focuses on collecting, preparing, analyzing, and interpreting data, artificial intelligence helps automate parts of this process and improves the ability of organizations to identify patterns, generate predictions, and make faster decisions. Therefore, the literature on AI, data science, and labor market transformation increasingly suggests that these two fields should not be viewed as separate or conflicting areas, but as deeply connected components of digital transformation.

A major theme in recent literature is the shift from automation as replacement to automation as augmentation. Earlier discussions about digital technologies often focused on whether machines would replace human workers. However, more recent studies on artificial intelligence show a more complex picture. AI can automate repetitive, routine, and technically narrow tasks, but many professional roles still require human judgment, contextual understanding, creativity, communication, ethical reasoning, and domain knowledge. This is especially relevant in data science. Data scientists may use AI tools for coding support, data cleaning, model selection, visualization, and report generation, but they are still responsible for defining the problem, evaluating data quality, interpreting results, identifying bias, and translating analytical findings into useful decisions. In this sense, AI changes the task structure of data science work rather than eliminating the profession itself.

This argument is strongly connected to labor market research. The OECD's work on AI and employment emphasizes that AI exposure does not automatically mean job loss. In the case of Korea, the OECD notes that AI can affect job quantity, job quality, skills, and inclusiveness, but its effects differ across occupations and worker groups. The

report also highlights that AI-related effects are often more positive for high-skilled, high-income, and computer-intensive occupations, which is directly relevant to data science because data professionals usually work with digital tools, analytical platforms, and technical decision-making systems. This supports the central idea of this article: data scientists are not simply threatened by AI; rather, they are among the professionals who can benefit from AI if they develop the right combination of technical, analytical, and strategic skills.

The importance of AI and data science is also linked to the global growth of data-driven economies. The World Bank's Digital Progress and Trends Report 2025 explains that artificial intelligence is reshaping economies and societies, but it also stresses that low- and middle-income countries face significant challenges in adopting and scaling AI effectively. This point is important for comparing Uzbekistan and South Korea. South Korea already has stronger technological infrastructure, advanced industries, and a more mature digital labor market. Uzbekistan, by contrast, is still developing its digital economy and building the human capital needed for large-scale AI and data science adoption. However, this difference does not reduce the relevance of AI and data science for Uzbekistan. Instead, it makes the topic even more urgent because developing economies need to prepare their workforce before the gap between local skills and global digital labor market requirements becomes wider.

The literature also shows that artificial intelligence readiness depends not only on technology, but also on education, infrastructure, regulation, innovation capacity, and labor market adaptability. The IMF's AI Preparedness Index, for example, evaluates countries through dimensions such as digital infrastructure, human capital, innovation, economic integration, regulation, ethics, and labor market policies. These dimensions are directly related to the development of data science as a profession. A country cannot build a strong data science labor market only by introducing AI tools. It also needs universities that teach statistics, programming, machine learning, and data ethics; companies that use data for decision-making; public policies that support digital transformation; and labor market systems that help workers reskill. Therefore, the connection between AI and data science is not only technical, but also institutional and educational.

In South Korea, the relevance of this topic is especially visible because the country is already recognized as a highly digitalized and technology-intensive economy. Korea's industries, including electronics, manufacturing, telecommunications, finance, robotics, and smart city development, rely heavily on advanced data systems and automation. The OECD's 2025 report on AI and Korea's labor market examines how AI affects employment, skills, job quality, and inclusiveness in the Korean context. This makes South Korea a useful case for understanding how AI and data science operate in a developed technological environment. In such economies, data science is not only an emerging profession but also a strategic function inside companies and public institutions. AI integration increases the demand for specialists who can work with

machine learning models, big data systems, predictive analytics, cloud infrastructure, and responsible AI practices.

At the same time, South Korea's experience shows that technological advancement does not remove the need for human skills. On the contrary, the more advanced the AI system becomes, the more important it is to have professionals who can monitor, interpret, improve, and govern it. AI systems require high-quality data, clear objectives, human validation, and ethical oversight. A prediction generated by an AI model is not automatically useful unless a skilled professional can explain what it means, how reliable it is, and how it should be applied. For this reason, data scientists in advanced economies are increasingly expected to combine technical skills with business knowledge, communication skills, and ethical responsibility. This trend is highly relevant for South Korea, where AI adoption is more mature and where the next stage of workforce development depends not only on producing more technical specialists, but also on improving the quality and adaptability of digital skills.

For Uzbekistan, the literature highlights a different but equally important situation. Uzbekistan is developing its digital economy, expanding ICT-related sectors, and increasing attention to artificial intelligence, startups, and digital entrepreneurship. UNDP's 2025 report on the digital economy of Uzbekistan provides an overview of the country's digital economy, startup ecosystem, ICT growth, export potential, AI development, and regulatory challenges. This is important because data science cannot grow separately from the broader digital economy. As Uzbekistan's companies and public institutions use more digital services, online platforms, fintech tools, customer databases, and e-government systems, the amount of available data increases. This creates a stronger need for specialists who can manage, analyze, and transform data into practical insights.

The development of data science in Uzbekistan is especially relevant because many organizations are still in the process of learning how to use data systematically. In advanced economies, companies may already have established data departments, analytics teams, and AI strategies. In developing economies, however, organizations may first need to understand the value of data itself. This means that data scientists in Uzbekistan may play a broader role than simply building models. They may also help organizations create data culture, improve data collection, clean and organize databases, explain the business value of analytics, and introduce AI-assisted tools gradually. Therefore, AI integration in Uzbekistan can become a productivity accelerator if it is combined with education, practical training, industry cooperation, and stronger digital infrastructure.

Another important point in the literature is that AI changes the skills required in the labor market. Traditional data science skills such as statistics, Python, SQL, machine learning, and data visualization remain important, but they are no longer enough by themselves. Modern data professionals also need to understand AI tools, prompt engineering, cloud computing, automated machine learning, data governance, responsible AI, cybersecurity awareness, and business communication. This is

particularly important for students and early-career specialists. The labor market increasingly rewards people who can not only perform technical analysis but also explain insights clearly and connect data results with real organizational problems. In this context, AI does not reduce the need for learning data science; it changes what kind of data science learning is most valuable.

The combination of AI and data science is also important for productivity. AI tools can reduce the time required for repetitive technical tasks such as writing basic code, preparing documentation, creating visualizations, detecting anomalies, summarizing datasets, and testing models. However, productivity gains depend on how well professionals use these tools. If users rely on AI without critical thinking, the result may be inaccurate analysis, biased conclusions, poor model selection, or misleading reports. If they use AI carefully, it can improve speed and quality. This is why the literature increasingly emphasizes human-AI collaboration. In data science, the most effective future workforce will likely consist of professionals who can combine machine efficiency with human reasoning.

Overall, existing literature shows that the relationship between AI and data science is not based on replacement, but on transformation and complementarity. AI automates some tasks, but it also increases the importance of human expertise in problem definition, interpretation, validation, ethics, and decision-making. South Korea demonstrates how AI and data science develop in a technologically advanced economy with strong industrial and digital foundations. Uzbekistan demonstrates why developing economies need to invest in digital skills, data literacy, AI readiness, and practical workforce preparation. The comparison of these two countries is therefore important because it shows different stages of the same global trend: as economies become more data-driven, demand grows for professionals who can work with both data science methods and AI-supported tools. This makes the topic highly relevant not only for researchers and policymakers, but also for students, universities, companies, and future data professionals.

Methodology

This study uses a comparative qualitative research design based on secondary data analysis. It examines how artificial intelligence and data science work together as complementary forces and how this relationship affects workforce transformation in Uzbekistan and South Korea. Uzbekistan is analyzed as a developing digital economy, while South Korea is examined as a technologically advanced country with a more mature AI and data science labor market.

The research relies on academic articles, international organization reports, policy documents, digital economy studies, and labor market-related sources. Materials from OECD, World Bank, IMF, UNDP, national digital institutions, and relevant scholarly literature are used to support the analysis. These sources help explain AI integration, digital transformation, skills demand, and changes in data-related professions.

The analysis follows three main steps. First, the study explains the relationship between AI and data science, including how AI supports data cleaning, coding,

visualization, predictive modeling, reporting, and decision-making. Second, it examines the development of AI and data science in Uzbekistan and South Korea separately. Third, it compares the two countries to identify similarities, differences, opportunities, and challenges in AI-supported workforce development.

This methodology is mainly analytical and interpretive. It does not conduct primary surveys or build a new statistical model. Instead, it interprets existing evidence to support the main argument that AI does not simply replace data scientists, but transforms their work by increasing efficiency and changing required skills. Since job market data can change quickly, the findings are interpreted as trend-based insights rather than fixed numerical conclusions.

Results and Discussion

This section presents the main findings from the selected statistical evidence and discusses what they mean for the relationship between artificial intelligence and data science in Uzbekistan and South Korea. The statistics were selected according to one principle: they must directly support the article’s central argument that AI is not simply replacing data scientists, but transforming the way data-related work is performed. For this reason, the discussion focuses on seven key areas: digital readiness, AI adoption, labor market demand, skill transformation, productivity and task transformation, education and human capital, and sectoral demand.

1. Digital readiness as the foundation for AI-supported data science

The comparison between Uzbekistan and South Korea first needs to begin with digital readiness, because AI and data science cannot develop without a strong digital foundation. Data science depends on data generation, internet access, digital platforms, cloud tools, and online business activity. In this context, the most recent DataReportal Digital 2026 country reports provide useful evidence. Uzbekistan had 33.1 million internet users at the end of 2025, with internet penetration reaching 89.0%. It also had 14.1 million social media user identities, equal to 37.9% of the population. South Korea, by contrast, had 50.6 million internet users, with internet penetration at 97.9%, and 49.3 million social media user identities, equal to 95.4% of the population. These figures show that both countries are highly connected, but their levels of digital maturity are very different. Uzbekistan has built a strong base of internet access, while South Korea has already reached a nearly saturated digital environment where almost the entire population is online and digitally active.

Indicator	Uzbekistan	South Korea
Internet users, Digital 2026	33.1 million	50.6 million
Internet penetration	89.0%	97.9%
Social media user identities	14.1 million	49.3 million
Social media user identities as share of population	37.9%	95.4%

This difference matters for data science. In Uzbekistan, rising internet access means that more citizens, companies, and public institutions are producing digital data. This creates future demand for data analysts, data scientists, machine learning engineers, and AI-supported business analysts. However, the lower level of social media

and platform-based engagement compared with South Korea suggests that Uzbekistan’s data ecosystem is still developing. South Korea, on the other hand, already has a mature digital environment. For South Korea, the main challenge is no longer basic connectivity, but how to use existing digital infrastructure for advanced analytics, AI integration, smart manufacturing, public services, and high-level automation. Therefore, Uzbekistan represents a market with strong growth potential, while South Korea represents a market with stronger readiness for deeper AI and data science integration.

2. AI adoption shows different stages of market maturity

The second important finding is that AI adoption is growing in both countries, but at different levels. In Uzbekistan, the most useful evidence comes from UNDP’s report on the digital economy and AI development. According to the report, 79.9% of surveyed businesses planned to expand AI adoption within the next twelve months, especially in sales, marketing, and customer engagement. At the same time, businesses reported serious barriers: 57.9% identified lack of skilled personnel, 47.4% pointed to data quality issues, and 36.8% mentioned high implementation costs. These statistics are important because they show that the problem is not the disappearance of data-related jobs. Instead, the problem is that many organizations do not yet have enough skilled professionals who can manage data, evaluate AI tools, and integrate AI into business operations.

South Korea shows a more advanced AI adoption pattern. Microsoft’s Global AI Diffusion Q1 2026 report shows that global AI usage increased to 17.8% of the world’s working-age population in the first quarter of 2026, and separate reporting on the same Microsoft report states that South Korea’s AI usage rate reached 37.1%, after increasing by 6.4 percentage points. This places South Korea far above the global average and shows that AI has moved beyond experimentation into wider everyday use.

AI adoption indicator	Uzbekistan	South Korea
Businesses planning to expand AI adoption	79.9%	Not directly comparable
Main AI expansion areas	Sales, marketing, customer engagement	Broad workplace and industrial use
Main barrier	Lack of skilled personnel, 57.9%	Reskilling and advanced integration
Latest AI diffusion signal	Business-level adoption evidence	37.1% working-age usage in Q1 2026

The discussion here is clear: Uzbekistan and South Korea are not at the same stage, but both demonstrate that AI is becoming relevant to work. In Uzbekistan, AI is still more visible in practical business functions such as marketing, sales, customer service, and digital communication. In South Korea, AI is already entering wider workplace and industrial processes. This supports the main argument of the article. AI is not simply replacing the data science profession; it is creating new needs for professionals who can help organizations move from simple AI use toward reliable, ethical, and data-driven AI integration.

3. Labor market evidence: demand is visible, but not equal

Labor market evidence also supports the idea that AI and data science are becoming complementary professional areas. In Uzbekistan, demand is still emerging, but it is already visible. According to an IT Park-related overview, local platforms such as hh.uz listed approximately 500 AI-related vacancies in 2024, including roles for data analysts, machine learning engineers, and researchers. The same source notes that demand for AI specialists is rising particularly in fintech, telecommunications, and software development. Another IT Park source states that by the end of 2024, there were over 300 vacancies related to cloud technologies in the local market, covering roles such as cloud solutions engineers, data developers, and security specialists. These figures show that Uzbekistan’s market is not yet large, but it is moving toward data-centered and AI-supported work.

South Korea has stronger evidence of a mature labor market. OECD’s 2025 report on AI and the labor market in Korea shows that the impact of AI is more positive for high-income, high-skilled, and computer-intensive occupations. This is highly relevant for data science, because data scientists usually work in computer-intensive environments and require analytical, statistical, and technical expertise. The same OECD report notes that a Korea Labor Institute survey found AI improving job performance, productivity, and job satisfaction, although the effects are not uniform across all workers and firms.

Labor market indicator		Uzbekistan	South Korea
AI-related	vacancies, 2024	Approx. 500	Not directly comparable
Cloud-related	vacancies, 2024	300+	Not directly comparable
Main sectors		Fintech, telecom, software development	ICT, manufacturing, public sector, advanced industries
Main labor market implication		Emerging demand	Mature and high-skill demand

This evidence should be interpreted carefully. Vacancy statistics from job platforms are not complete national labor market statistics. They depend on platform coverage, keyword matching, employer behavior, language, and date of search. However, they are useful indicators of visible demand. For Uzbekistan, they show that AI and data skills are no longer only theoretical future skills; they are already appearing in real job postings. For South Korea, the OECD evidence suggests that AI is changing the structure of work, especially by increasing the value of high-skilled and computer-based jobs. Therefore, the labor market evidence does not support the idea that AI is simply removing data science careers. Instead, it shows that data professionals need to adapt to more AI-supported workflows.

4. Skills are changing, not disappearing

A central finding of this study is that AI changes the skills required from data professionals. The World Economic Forum’s Future of Jobs Report 2025 is especially

useful here. It states that nearly 40% of skills required on the job are expected to change, while 63% of employers identify the skills gap as a key barrier to business transformation. The same report highlights AI, big data, cybersecurity, and technology literacy among the fastest-growing skill areas. This is directly connected to the future of data science, because data professionals will not only need traditional skills such as Python, SQL, statistics, and data visualization, but also AI literacy, machine learning understanding, cloud knowledge, responsible AI awareness, and business communication.

For Uzbekistan, the skills issue is particularly important because UNDP identifies lack of skilled personnel as the largest barrier to AI adoption among surveyed businesses. If 57.9% of businesses struggle because of a lack of skilled personnel, then the real labor market problem is not that AI has made data professionals unnecessary. The problem is the opposite: companies need more professionals who can understand data, prepare datasets, use AI tools, evaluate model outputs, and apply insights in business decisions.

For South Korea, the issue is not basic digital literacy alone, but advanced skill transformation. OECD evidence suggests that high-skilled and computer-intensive jobs can benefit more from AI exposure. This means that professionals with strong technical backgrounds may become more productive when they use AI effectively, while lower-skilled workers may receive fewer benefits unless they are supported through reskilling.

The implication is that future data scientists should not study only tools. They need a hybrid skill set. A modern data professional must understand data cleaning, exploratory analysis, statistical thinking, machine learning, AI-assisted coding, cloud platforms, visualization, ethical risks, and business interpretation. AI can generate code or suggest a model, but it cannot fully replace the human responsibility to define the problem, check data quality, interpret outputs, and explain results to decision-makers.

5. Productivity evidence: AI transforms tasks rather than replacing whole jobs

The strongest argument against the “AI will replace data scientists” narrative comes from task-level productivity evidence. AI can automate or accelerate parts of data science work, but it does not remove the entire profession. For example, AI can help with data cleaning, code generation, debugging, visualization, report drafting, anomaly detection, and model testing. However, human professionals still need to decide whether the analysis is meaningful, whether the data is biased, whether the model is appropriate, and how the result should be used.

South Korea provides useful evidence here. OECD’s Korea report states that a 2024 Korea Labor Institute survey found AI improving productivity and job performance. It also notes that workers and firms were generally positive about AI’s impact on productivity, performance, convenience, accuracy, and job satisfaction. Importantly, this does not mean AI solves everything automatically. Rather, it means AI can improve task efficiency when used by skilled workers inside real work processes.

Uzbekistan also has early examples of task transformation. UNDP’s 2026 publication on AI adoption in Uzbekistan’s private sector examines opportunities and barriers for responsible and scalable AI development, especially among micro, small, and medium-sized enterprises. This shows that the country is beginning to discuss AI not only as a policy idea, but as a practical productivity tool for companies.

This finding is important for data science. Many tasks inside data science are time-consuming but not fully strategic. Cleaning data, writing repetitive code, preparing initial charts, drafting documentation, or summarizing outputs can take many hours. AI can reduce time spent on these tasks. But the higher-value parts of the profession remain human-centered: asking the right question, understanding the sector, checking model validity, identifying ethical risks, and converting analysis into a decision. Therefore, AI does not reduce the need for data scientists; it pushes data scientists toward higher-level work.

6. Education and human capital: the main condition for successful integration

AI-supported data science depends heavily on education and human capital. Uzbekistan’s latest education data show rapid growth in IT training capacity. According to the Ministry of Digital Technologies, the number of registered private IT training centers increased from 390 in 2024 to 428 in 2025. IT training graduates increased from 24,800 to 37,800, and more than 16,300 graduates secured employment. At the higher education level, institutions offering IT-focused programs increased from 102 to 145, while student enrollment rose from over 78,000 to 120,800. These figures are important because they show that Uzbekistan is expanding the talent base needed for AI and data science.

South Korea is also investing in AI education, but from a more advanced starting point. In 2026, South Korea selected 1,141 AI-focused schools, and the Ministry of Education planned to expand the number to 1,500 in 2027 and 2,000 in 2028. The program also includes AI instruction across subjects and stronger AI ethics education. This shows that Korea is not only training specialists at university level, but also embedding AI literacy into earlier education.

Human capital indicator	Uzbekistan	South Korea
IT training centers	390 in 2024; 428 in 2025	Not directly comparable
IT training graduates	24,800 in 2024; 37,800 in 2025	Not directly comparable
IT-focused higher education institutions	102 in 2024; 145 in 2025	Not directly comparable
Students in IT-focused programs	78,000+ in 2024; 120,800 in 2025	Not directly comparable
AI-focused schools	Not available	1,141 in 2026; target 2,000 by 2028

This comparison shows two different priorities. Uzbekistan needs to expand foundational and applied digital skills, especially in programming, data analysis, machine learning basics, cloud systems, and business analytics. South Korea needs to deepen advanced AI literacy, responsible AI use, and sector-specific AI education. In

both countries, however, education is the key link between AI adoption and labor market benefit. Without human capital, AI tools remain underused or misused. With strong human capital, AI becomes a productivity partner.

7. Sectoral demand: AI and data science are becoming practical business tools

Sectoral evidence shows where AI and data science are most relevant. In Uzbekistan, demand is concentrated in fintech, telecommunications, and software development, according to the same job-market overview that reported around 500 AI-related vacancies in 2024. These sectors naturally produce large amounts of customer, transaction, communication, and operational data. Therefore, they need data analysts, machine learning specialists, data engineers, and AI-literate business analysts.

In South Korea, sectoral demand is broader and more industrial. According to the 2024 AI Industry Survey cited by Invest Korea, the main applied industries for AI products and services were information and communications at 46.0%, followed by manufacturing at 35.7%, and public administration, defense, and social security administration at 24.8%. This shows that South Korea’s AI demand is not limited to software platforms; it is deeply connected to manufacturing, public services, and industrial transformation.

Sectoral indicator	Uzbekistan	South Korea
Strongest sectors	Fintech, telecom, software development	ICT, manufacturing, public administration
Business AI focus	Sales, marketing, customer engagement	AI products, services, smart manufacturing, public services
Industrial maturity	Emerging	Advanced
Main implication	Growing demand for applied data skills	Mature demand for advanced AI-data integration

This sectoral pattern strengthens the article’s main argument. AI and data science are becoming practical tools for real industries, not abstract academic topics. In Uzbekistan, the strongest opportunity is to use AI-supported data science to improve financial services, telecom analytics, customer behavior analysis, marketing performance, and digital services. In South Korea, the opportunity is to use AI and data science in advanced manufacturing, ICT services, robotics, smart factories, and public administration. The two countries are different, but the direction is similar: organizations need people who can transform data into decisions with the help of AI.

Overall discussion

Taken together, the evidence shows that Uzbekistan and South Korea represent different stages of the same global transformation. Uzbekistan is rapidly building the foundations for an AI-supported data science workforce: internet access is high, IT education capacity is growing, AI-related vacancies are appearing, and businesses are planning to expand AI use. However, the country still faces barriers related to skilled personnel, data quality, implementation costs, and organizational readiness. South Korea, by contrast, has a mature digital environment, stronger AI diffusion, broader

industrial use, and more advanced education initiatives. Its main challenge is not basic access, but advanced reskilling, responsible AI use, and deeper integration across industries.

The most important conclusion from the results is that AI does not make data science irrelevant. Instead, it increases the importance of data professionals who can combine technical ability with human judgment. AI can support coding, cleaning, modeling, summarizing, and visualization, but it cannot fully replace the ability to define a business problem, understand context, evaluate reliability, detect bias, and communicate insights responsibly. Therefore, the future of data science in both Uzbekistan and South Korea depends on complementary integration: AI provides speed and automation, while data scientists provide reasoning, interpretation, ethics, and decision-making.

This article examined artificial intelligence and data science as complementary forces in the transformation of modern work, with a comparative focus on Uzbekistan and South Korea. The main finding is that AI should not be understood only as a threat to data science jobs. Instead, AI is changing the structure of data-related work by automating repetitive tasks, increasing analytical speed, improving productivity, and allowing professionals to focus more on interpretation, strategy, ethical judgment, and decision-making. Data science remains important because organizations still need skilled people who can define problems, evaluate data quality, select suitable methods, interpret model outputs, and transform technical findings into practical business or policy decisions.

The comparison between Uzbekistan and South Korea shows that both countries are moving toward AI-supported data-driven development, but they are doing so from different starting points. South Korea represents a technologically advanced economy with strong digital infrastructure, high internet penetration, wider AI diffusion, and more mature sectoral demand in areas such as ICT, manufacturing, public administration, robotics, and smart factories. In this context, the main challenge is not basic access to technology, but advanced reskilling, responsible AI use, and deeper integration of AI into high-value industries. Uzbekistan, by contrast, represents a developing digital economy where the foundations of AI and data science are still being strengthened. Internet access, IT education, AI-related vacancies, private-sector AI adoption, and demand in fintech, telecommunications, software development, sales, marketing, and customer engagement show that the country is entering an important growth stage.

The results also show that the main issue is not whether AI will completely replace data scientists, but whether workers, universities, companies, and governments can adapt to the new skill requirements created by AI. In Uzbekistan, the lack of skilled personnel and data quality problems remain major barriers to AI adoption. This means the country needs more specialists who understand not only programming and analytics, but also data governance, cloud systems, machine learning, AI tools, business interpretation, and responsible technology use. In South Korea, the evidence shows that

AI can improve productivity and task performance, especially in high-skilled and computer-intensive occupations. However, even in a developed economy, continuous upskilling is necessary because AI changes how people work, what tools they use, and what kind of value they are expected to create.

Based on these findings, several suggestions can be made. First, universities in Uzbekistan should update data science and IT-related curricula by adding practical AI integration modules. Students should not learn data science only through theory, statistics, or programming exercises. They should also learn how to use AI tools for data cleaning, coding assistance, visualization, model testing, reporting, and decision support. However, these tools should be taught with critical thinking. Students must understand that AI-generated outputs are not always correct and should always be checked, interpreted, and evaluated by humans.

Second, stronger cooperation between universities and industry is needed. Companies in fintech, telecommunications, software development, e-commerce, education, and public services should work with universities to create real case studies, internships, capstone projects, and applied data science laboratories. This would help students understand how data science is used in real organizations and what skills employers actually need. For Uzbekistan, this is especially important because the labor market is still emerging and many companies are only beginning to use data and AI systematically.

Third, companies should treat AI as a productivity tool rather than a replacement strategy. Instead of reducing human involvement, organizations should train employees to use AI for repetitive and time-consuming tasks while keeping human control over interpretation, ethics, and final decision-making. This approach can increase efficiency without weakening the quality of analysis. In data science teams, AI can be used to support coding, documentation, exploratory analysis, dashboard creation, and basic model experimentation, but final responsibility should remain with qualified professionals.

Fourth, policymakers should support digital infrastructure, data quality, and AI governance.

AI-supported data science requires reliable datasets, secure systems, ethical rules, and clear standards for privacy and accountability.

Uzbekistan can benefit from South Korea's experience by investing not only in technology, but also in human capital, AI education, research support, and responsible innovation.

At the same time, Uzbekistan should develop its own approach based on local labor market needs, language context, business readiness, and national development priorities.

Finally, students and future data professionals should understand that the AI era does not reduce the value of data science. It raises the standard.