Managementof Civil Servants' Career in the Artificial Intelligence Era

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doi: 10.25019/STR/2024.001

Abstract
In the artificial intelligence era, the investment in human resources represents the best way to ensure the public organization's success and bright future. The overall objective of the paper is to capture a comprehensive and genuine image of career management in the public sector and to evaluate the impact of using artificial intelligence (AI) at the central and local government levels. The research questions are: How is Romania improving the management of civil servants' careers? How is Romania's performance in applying artificial intelligence in the public sector? Is Romania prepared to face the challenges of exponential artificial intelligence development? The paper explores the landscape of career management in the European and national public sectors, emphasizing the key issues for its improvement. It also analyses the use of artificial intelligence in the European and national public sectors, highlighting the main realities and trends. The conclusion of this research highlights that in the era of artificial intelligence, the leaders in public organizations should have a holistic approach, meaning to create a positive, empowering culture, enable AI innovation, support the changes brought by emerging technologies, identify the competence set specific for AI projects and support training programs in view to endow the public employees with the AI-related competences, as well as to evaluate AI impact. The methodology comprises bibliographic syntheses, socio-innovative empirical research, correlation, and regression analyses. The contribution brought by this research consists in presenting the realities and roadmap for effective management of civil servants' careers and the use and impact of artificial intelligence in central and local government in view to be successful in times of outstanding challenges and opportunities, as well as in analyzing the statistical connection between government artificial intelligence and digital competitiveness.

Keywords
Artificial Intelligence; Career Management; Civil Service; Digitalization; Digital Competitiveness.

Introduction

The public sector requires distinctive competencies and a different career development approach than the private sector.

The paper attempts to capture a comprehensive and genuine image of career management in the European and Romanian public sector and evaluate artificial intelligence's impact at the central and local government levels. The research questions are focused on: How is Romania improving the management of civil

servants' careers? How is Romania's performance in applying artificial intelligence in the public sector? Is Romania prepared to face the challenges of exponential artificial intelligence development?

In this context, the paper explores the landscape of career management in the European and national public sector, presenting the primary realities and trends highlighting the key drivers for fostering civil servants' career development. To apply a roadmap for success, it is important to identify the career pathways, understand the specific civil servants' roles and opportunities, and the main areas of interest to make them compatible with the needs and priorities of public organizations. Aligning personal career goals with the public organization's mission is crucial, ensuring a harmonious and productive working relationship. At the same time, networking within and outside the public organization triggers new opportunities, thus representing a strong tool for career advancement.

Creating a robust competence set means developing essential competencies for success in the public sector: assertive communication, leadership, problem-solving, adaptability, innovation, and creativity. Embracing continuous training is crucial as public employees should attend lifelong learning programs to be updated with the evolving policies, strategies, emerging technologies, and methodologies. To prepare for the future, the civil servants should adapt to changes as the public sector is dynamic, with frequent changes in policies, strategies, and technologies, and considering the new societal needs. Being adaptable to changes is crucial for a long-term successful career.

At the same time, the paper reveals the analysis of artificial intelligence's impact on the public sector at the European and national level and its use in the digitalization of society, highlighting the main realities and trends. Also, the current research analyses the statistical connection between government artificial intelligence and digital competitiveness.

Career management significance in public organizations

The concept of a public career has many meanings in the digital economy, considering several crucial factors: the individual's role in managing his/her career, the public organization's support, and the public sector's specific and general context. A career in public service entails gaining a variety of personal and professional experiences that the individual feels throughout his/her life, either sequentially or simultaneously. Each person develops a special combination of factors in an effort to balance his/her personal and professional life. In the context of a knowledge-based economy, this process is unique, dynamic, precise, and innovative, and it requires creative, continuous, and persistent lifelong development. The analysis of career management is twofold: at the individual level, focusing on career development, and organizational level, with an accent on career management. Researchers have applied a comprehensive and multidimensional approach to career management in the public sector, integrating individual, organizational, and environmental research levels (Baruch, 2015; Akkermans et al., 2016; De Vos et al., 2018).

Substantiated on the complexity theory (Arevalo & Espinoza, 2015), in view of managing complex systems, such as career management systems of organizations, it is

important to have the landscape of the relevant information, aiming to highlight the key actors and their relationships, the dynamics of the whole system, the future trends. In the development of public organizations, it is worth mentioning "the adaptability of structures and their on-going reconfiguration through the adoption of new, creative solutions, which highlight adjustments to career management systems in a dynamic environment that experiences on-going changes" (Andrews et al., 2011).

Career development can be defined in terms of skills and needs in view to perform tasks with a high degree of complexity and at the same time to contribute to the development of the public organization. Professional training in all its forms: initial, advanced, or specialized training represents a very important pillar in civil servants' career development. The training has as its primary purpose the professionalization and, implicitly, the professional performance.

Landmarks on career management in the Romanian public sector

Romania's Recovery and Resilience Plan responds to the urgent need to foster a strong recovery while making Romania's economy and society more resilient and future-ready. For now, the transition towards a strategic, modern, digital, and green management of human resources in public administration is accomplished through reform measures financed by the National Recovery and Resilience Plan (NRRP). NRRP comprises *Component C7 - Digital transformation*, with important and relevant milestones and targets (Government of Romania, Ministry of Investments and European Projects, 2023). Concerning civil service management, Investment 10 - *Digital transformation of civil service management* is relevant.

Interactive and collaborative platforms for standardized human resource management in central and local governments have been established. Thus, two interoperable platforms are operational:

- e-ANFP: development and expansion of the civil service management platform (all processes – onboarding - recruitment - evaluation/promotion/exit from the public system, competence framework model, standardized job descriptions).
- SIMRU: development of the internal management platform for public authorities:

✓ Self-service (access to a digital professional file for the employee, automated generation of certificates, administrative file, validation of study documents, etc.).
✓ Self-management (direct updating of the own professional file by the civil servant).

Component C7 - Digital transformation, Investment 16, *Advanced digital skills training program for civil servants* is essential for civil servants' career development. In the context of the digitalization of public administration, four general training programs are relevant:

✓ Management (concepts and perspectives, use of online information, cyber security, office systems, project management, teamwork applications).
✓ Communication (use of online information and digital content creation, cyber security, teamwork, presentations, web design, image editing, digital marketing of public services, social networks for public administration).
✓ Financial issues (spreadsheets, databases, presentations).
✓ Back office (use of online information, cyber security, project management, teamwork, text editing, databases, spreadsheets, presentations)

as well as nine specialized training programs in the ICT field:

- ✓ Digital tools for remote work/telework.
- ✓ Advanced statistics: data collection, processing, and interpretation.
- ✓ Online consultation tools (questionnaire design, Google Forms, Survey Monkey, Lime Survey).
- ✓ Installation, configuration, and administration of operating systems (Windows, Linux).
- ✓ Databases (cloud computing, Azure, MySQL, Oracle).
- ✓ Development of non-web desktop applications (C++, Windows applications, ADO.NET technology).
- ✓ Business Analytics (Big Data, Python, text mining, Business Intelligence, regulation, ethics, trends).
- ✓ Administration, development, and security of ICT networks.
- ✓ Development of web design applications (architecture and design of Enterprise Java applications, development of web services using Java, secure web services, JavaScript, HTML, CSS).

The National Recovery and Resilience Plan (NRRP) also comprises *Component C14 – Good Governance - Reform 3*, focused on *Effective human resource management in the public sector*.

Milestone 417 refers to the national public service recruitment competition. It is a new way of recruiting for civil service positions through a transparent, inclusive, and competence-based process directly correlating with institutional needs. It is inspired by the model applied in the European institutions, adapted for Romania's civil service development. It has been implemented in stages since 2019, comprising: public policy proposal, competition model, piloting for two categories of civil service positions, accomplishment of ex-post analysis of the pilot national competition, and extension to other categories/grades of civil service positions.

Milestone 418 focuses on identifying and implementing solutions to increase the prestige of civil service. It is accomplished through the adoption and entry into force of two legislative acts on human resource management:

- ✓ Introduction of meritocracy changes on management of civil servants 'careers.
- ✓ Regulation of management of contractual staff in public administration.

The outcomes expected are as follows:

- ✓ Improved prestige of civil service so that the image of civil servants should be fairly perceived by beneficiaries and effectively presented towards public opinion.
- ✓ The civil service will become predictable and stable by creating a professional, attractive, and dynamic work environment for all those who want to enter the body of civil servants, ensuring an efficient and effective public administration that will provide quality services to citizens.

The recommendation is focused on establishing a meritocracy-based human resource management system in view to support the development and diversification of employees' professional skills; a competence-based individual professional performance evaluation system; a transparent and inclusive recruitment system for the public administration based on competencies and in direct correlation with the institutional needs of human resources, respecting the principles of gender equality

and equal opportunities of the European Pillar of Social Rights. The main activities consisted in:

- ✓ Integrated and updated study on human resource management - an analysis of human resource management with clear, reliable, and procedural solutions in view to facilitate the elaboration and substantiation of the legislative package aimed at changes in meritocracy-based management of civil servants' careers;
- ✓ Legislative proposal on human resource management that considers changes in meritocracy-based management of civil servants' careers, rewarding performance, and contributing to staff development and legislative proposal on the management of contractual staff from public administration.
- ✓ Package of public interventions to disseminate and promote the outcomes and recommendations, aiming to increase the prestige of the civil service.

The activities that have been completed are as follows:

- ✓ Study on the current situation of civil servants' careers in public administration, comprising the formulation of recommendations.
- ✓ Analysis of management of contractual staff, respectively, the analysis of the normative framework that distinguishes between the two categories: civil servants and contractual staff.
- ✓ Study on how the image of civil servants is perceived in other European states and how different states managed to increase the prestige of the public service.
- ✓ Public policy proposal on meritocracy-based management of civil servants' career.
- ✓ Public policy proposal on the management of contractual staff in public administration.

The need to elaborate the public policy proposal is based on the problems identified by studies and analyses. It is worth mentioning the following ones:

- ✓ 76% of executive civil servants are in the highest professional grade, leading to high demotivation.
- ✓ Lack of attractiveness of civil service position.
- ✓ Low trust of citizens in public administration and the citizens' difficulty interacting with administration.
- ✓ Occurrence of cases of corruption in public administration.
- ✓ The level of politicization in public administration is perceived as high.
- ✓ The trend to increase the number of temporarily occupied positions and the turnover of the degree of occupation of positions in the category of high civil servants.
- ✓ Lack of professional training opportunities adapted to needs, especially for leading civil servants.

The objectives are focused on:

- ✓ The introduction of a longer career path for the executive civil service position, usually 16 years instead of 7 years as it is currently.
- ✓ Ensuring a transition to the new career path that does not affect the existing rights and does not create grounds for discrimination.
- ✓ Diversification of the career path possible for civil servants who want to perform by opening two possibilities, after accessing the current maximum professional degree, respectively the possibility of career development

through: 1. promotion to a management position and development of management and leadership skills; 2. promotion to a new executive level and development of skills at the level of excellence.

- ✓ Increasing the attractiveness of the civil service, providing clear, diversified, development perspectives.

Milestone 419 consists of operationalizing the competence framework to improve the public organization's performance. The competence framework shall be used for human resource strategic planning, depending on the current needs and challenges of the public organization and foresight of future needs and evolutions.
The competence framework is focused on:

- ✓ Skills for performance.
- ✓ Recruitment and career development.
- ✓ Performance evaluation.
- ✓ Talent management.
- ✓ Attracting and retaining staff.

Table 1 presents the main drivers for improving the management of civil servants' careers.

Table 1. Main drivers for fostering the management of civil servants' career

Increasing professionalism and commitment to public service Meritocracy-based recruitment and promotion processes so that competencies and outcomes determine career advancement. Development of mechanisms for increasing the attractiveness of pursuing a civil service career for young people. Developing a powerful competence set. Rewarding the exceptional merits and outstanding performance through adequate rewarding systems, i.e., promotion, distinctions, and benefits.	**Innovative governance** Promoting creativity. Stimulating the entrepreneurial spirit. Fostering risk-taking. Encouraging teamwork. Embracing talent management. Boosting the innovation drivers.
Fostering integration of technology Integrating technology in view to improve the efficiency, transparency and accessibility of public services. Implementation of digital solutions in view to reduce the time and resources for administrative processes. Providing remote services by digitalizing the activities. Cyber security	**Organisational culture** Creating a positive, motivational, empowering culture that encourages collaboration, innovation, and mutual respect, thus contributing to civil servants' satisfaction and commitment.
Transparency Implementation of transparency measures in decision-making processes and public resources management through appropriate IT systems and to show how the public expenses are achieved. Increasing citizens' participation in decision-making through consultation and public involvement.	**Professional ethics** Implementation of measures to prevent corruption and manage conflicts of interest. Encouraging the application of Law no. 361/2022 on protecting whistle-blowers for the public interest.
Communication	**Collaboration, Networking**

Development of open and effective communication channels between civil servants and citizens (use of phone-green lines, use of virtual assistants, etc.). Providing clear and accessible information on the actions and decisions of public administration.	Strengthening the collaboration with academia, private organizations, and civil society to benefit from the experience and know-how and to ensure complex, innovative approaches. Creating online platforms for collecting feedback and ideas from citizens. Networking within and outside the public organization triggers new opportunities. Using online consultation tools
Continuous training and development Ensuring effective training programs for civil servants relevant to their activities. Providing continuous training programs to keep pace with the legislative, technological, and social changes (especially in information technology).	**Creating an attractive, dynamic work environment** Ensuring a fair and attractive work environment.

Source: Authors' research results

Key issues on artificial intelligence in the public sector

Digital transformation should represent a priority for public organizations in view of delivering quality public services. Digital technologies have a rapid evolution, and in view of successful adoption, public administrations should address technological and/or organizational challenges. For now, computing and big data developments have made artificial intelligence a reality.

Artificial Intelligence (AI) has great potential to trigger the modernization of the public sector, becoming an essential enabler for the improvement of efficiency and effectiveness in the management and delivery of public services. Emerging technologies, such as AI, "offer the potential to positively impact public administrations, streamlining administrative processes and improving the effectiveness of public services for citizens and businesses alike" (Sun & Medaglia, 2019). AI impact is outstanding, sometimes outperforming people in various activities, including those requiring cognitive skills. At the same time, exceptional researchers are analyzing the need for public administration to prepare to use AI. In this respect, authors assert that in view to be successful in AI adoption, "governments should not only invest in high-quality data but also make sure that the public sector is ready to manage and harness such information" (Van Noordt & Misuraca, 2020). Other researchers explore the technical and managerial capabilities public administration needs to adopt emerging technologies.

The challenges public administration faces are also analyzed (Sienkiewicz-Małyjurek, 2023; Van Noordt et al., 2023). As already known, "public organizations are characterized by formal and rigid structures and demands of AI innovation that require experimentation and flexibility" (Selten & Klievink, 2024). On 12 July 2024, the AI Act was published in the EU's Official Journal, becoming Regulation (EU) 2024/1689. The AI Act represents an essential part of the EU's extensive digital strategy, together with the Digital Services Act and the Digital Markets Act. The adoption, use, and impact of emerging technologies in public administration are continuously assessed, and the European Commission brings a significant contribution through the case-based approach by "analyzing systematically a large number of

concrete examples of AI use by public bodies" (European Commission, 2022). In this context, the European Commission has analyzed the development, uptake, and impact of AI in Europe and published relevant contributions, including the AI Watch—European Landscape on the use of Artificial Intelligence by the Public Sector (European Commission, 2022).

It would be highly beneficial for the EU countries, public administrations, private companies, and users to promote awareness regarding the potential positive impact of artificial intelligence in the public sector. Simultaneously, it is necessary to acknowledge the complexity and associated risks linked to its implementation. This emphasis is crucial for fostering individual, organizational, and cultural changes required to ensure its effective implementation. Also, it is important to share practices and experiences, considering the European level as the optimal place for learning from each other's success stories and failures. This collaborative approach is essential to ensure a cross-border, trustworthy, and effective AI use for enhancing public services.

Key Issues on artificial intelligence in the Romanian public sector

On July 11, 2024, the Government of Romania approved the National Strategy on Artificial Intelligence ("AI Strategy"). The AI strategy defines the general objectives at the national level in relation to AI adoption, namely:

- "Supporting education in research and development and training for AI-specific skills.
- Developing a resilient infrastructure along with usable and reusable datasets.
- Strengthening R&D in the field of AI.
- Encouraging the transfer of technology from the research-innovation environment to production.
- Supporting measures that encourage the adoption of AI in society.
- Establishing a governance system and an appropriate regulatory environment for AI" (Authority for Digitalisation of Romania, 2024).

Implement Consulting Group has achieved a study, commissioned by Google that has estimated generative AI's GDP contribution and implications on jobs in Central and Eastern Europe. "Capturing the full potential of generative AI depends on several drivers of AI adoption – from a robust operating environment to the availability of skilled AI practitioners" (ICG, 2024). According to the study, "if Romania widely adopts generative artificial intelligence, the GDP could increase by 5%, 14-16 billion euros in around ten years" (ICG, 2024). The increase derives from the advance of labor productivity for more than half of the employees, the freed time being dedicated to other value-creating activities. In the optimistic scenario, "the total impact would be 7% of GDP, i.e., 20-22 billion euro" (ICG, 2024). "In total, it is estimated that generative artificial intelligence will have an impact on up to 4.5 million jobs in Romania. AI is expected to bring improvements to more than half of jobs in Romania (54% or 4.2 million) by automating a limited part of their tasks, helping with content creation (text, code, and images), and providing support in solving complex problems and contributing to the design of products" (ICG, 2024). The study also reveals that around 42% of the workforce in Romania will not be affected by AI adoption.

The public sector in Romania is already going through a significant digital transformation. It is also worth mentioning that the integrated program for digitalizing local governments was launched on 19 September 2024. The local governments (1000 town halls and county councils) will receive digital vouchers to procure digital equipment.

An ambitious, unique application for modernizing the Romanian public administration has been launched by implementing artificial intelligence and other emerging technologies. It represents a concrete example of adopting artificial intelligence in public administration, revolutionizing how ministries and agencies manage their information. Benefiting from 20 million euro funding, 18 ministries and agencies can automatically process massive data sets, thus marking a crucial transition towards a digitalized and streamlined administration. This application will eliminate a significant part of the work of civil servants, replacing it with automated data processing systems.

Statistical analysis of Government AI related to Digital Competitiveness in the EU member states

Government AI

The Government Artificial Intelligence Readiness Index is structured on three pillars, including 39 indicators across 10 dimensions: the Government Pillar, the Technology Sector Pillar, Data & Infrastructure Pillar. Concerning the Government pillar, a government should have a strategic vision for developing and governing AI, supported by appropriate regulations and attention to ethical risks. Concerning the Technology Sector Pillar, a government depends on a good supply of AI tools. The public sector should have high innovation capacity and good levels of human capital. For the Data & Infrastructure Pillar, having the infrastructure necessary to power AI tools and deliver them to citizens is important.

Table 2. Government Artificial Intelligence Readiness Index in the EU Member States

Country	TC	GP	TSP	DIP	Country	TC	GP	TSP	DIP
Austria	72.37	77.69	56.43	82.98	Italy	67.63	76.61	50.98	75.29
Belgium	67.28	73.09	56.02	72.74	Latvia	60.3	72.07	38.57	70.27
Bulgaria	58.64	66.04	38.17	71.73	Lithuania	63.33	75.31	43.7	70.99
Croatia	49.34	42.25	39.35	66.42	Luxembourg	69.41	83.11	46.51	78.6
Cyprus	60.84	69.39	42.04	71.09	Malta	63.64	80.74	40.89	69.31
Czech Republic	65.17	72.25	47.72	75.55	Netherlands	74.47	78.9	61.96	82.55
Denmark	73.91	84.11	59.98	85.75	Poland	63.1	69.79	46.84	72.66
Estonia	70.86	80.54	52.52	79.54	Portugal	68.28	80.48	50.95	73.42
Finland	77.37	88.34	60.36	83.39	Romania	52.32	51.42	39.23	66.3
France	76.07	84.03	60.4	83.8	Slovak Republic	60.73	67.7	40.6	73.9
Germany	75.26	80.78	63.28	81.72	Slovenia	62.63	71.75	41.86	74.29
Greece	57.95	55.92	48.37	69.56	Spain	67.47	72.86	50.96	78.6
Hungary	60.66	69.96	42.2	69.82	Sweden	72.55	74.7	62.71	80.26
Ireland	69.82	71.51	56.96	81	EU average	65.98	73.01	49.61	75.61

Legend: TC – Total score; GP – Government Pillar; TSP – Technology Sector Pillar; DIP – Data & Infrastructure Pillar

Source: The authors, based on Oxford Insights (2023)

Notably, Finland, France, and Germany are the top performers, while Greece is the lowest performer. Romania should improve the total score of 52.32, especially the TSP score by reaping the whole AI potential and boosting the innovation drivers. Romania should also strengthen its innovation capabilities, promote widespread AI adoption, and enhance the public employees' competencies.

Digital Competitiveness

The IMD World Digital Competitiveness Index reveals the digital competitiveness *of* global economies, highlighting the key factors that drive and shape competitiveness, thus providing valuable insights and benchmarks.

Table 3. IMD World Digital Competitiveness Index, in the EU Member States

Country	C	Country	C	Country	C
Austria	81.10	Germany	80.86	Poland	66.53
Belgium	85.95	Greece	54.70	Portugal	69.78
Bulgaria	50.66	Hungary	58.25	Romania	58.25
Croatia	62.01	Ireland	81.48	Slovak Republic	58.31
Cyprus	54.77	Italy	64.39	Slovenia	69.14
Czech Republic	79.42	Latvia	66.36	Spain	76.62
Denmark	96.93	Lithuania	77.23	Sweden	94.12
Estonia	84.77	Luxembourg	78.73	EU average	73.61
Finland	94.05	Malta	66.18		
France	78.65	Netherlands	98.10		

Source: The authors, based on IMD World Digital Competitiveness Index (2023)

The Netherlands, Denmark, Sweden, and Finland are the top countries, while at the other extreme, we find countries such as Romania, Cyprus, Greece and Bulgaria. Romania should improve talent management, focus on training and education, and enhance IT integration.

Statistical analysis of Government Artificial Intelligence related to Digital Competitiveness in the EU Member States

As AI drives digital transformation, understanding its influence on digital competitiveness across EU Member States is crucial for effective policy-making. This section explores government-led AI initiatives through statistical analysis, highlighting their impact on national digital performance. By examining key trends and comparative metrics, we provide insights into how AI policies shape the digital competitiveness landscape within the European Union.

Correlations

		GP	TSP	DIP	C
GP	Pearson Correlation	1	.586**	.726**	.634**
	Sig. (2-tailed)		.001	<.001	<.001
TSP	N	28	28	28	28
	Pearson Correlation	.586**	1	.858**	.830**
	Sig. (2-tailed)	.001		<.001	<.001
	N	28	28	28	28
DIP	Pearson Correlation	.726**	.858**	1	.804**
	Sig. (2-tailed)	<.001	<.001		<.001

	N	28	28	28	28
C	Pearson Correlation	.634**	.830**	.804**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	28	28	28	28

** Correlation is significant at the 0.01 level (2-tailed).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	TC[b]	.	Enter

a. Dependent Variable: C
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.819[a]	.670	.657	7.88116

a. Predictors: (Constant) TC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3279.359	1	3279.359	52.797	<.001[b]
	Residual	1614.931	26	62.113		
	Total	4894.290	27			

a. Dependent Variable: C
b. Predictors: (Constant) TC

Coefficients[a]

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-30.077	14.347		-2.096	.046
	TC	1.571	.216	.819	7.266	<.001

a. Dependent Variable: C

Outcomes of Correlation

According to the Table of Correlation, we have the following significant relationships between the variables:

- **GP** and **C**: The Pearson coefficient is 0.634, significant at the 0.01 level ($p < 0.001$). It suggests a moderate positive correlation between the GP index and competitiveness.
- **TSP** and **C**: The Pearson coefficient is 0.830, significant at the 0.01 level ($p < 0.001$). It indicates a very strong correlation between TSP and competitiveness.
- **DIP** and **C:** The Pearson coefficient is 0.804, significant at the 0.01 level ($p < 0.001$). Also, there is a strong correlation between DIP and competitiveness.

All correlations are statistically significant and positive, suggesting that all three AI indices (GP, TSP, DIP) contribute positively to increasing competitiveness.

Regression
Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	DIP, GP, TSP[b]	.	Enter

a. Dependent Variable: C
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.855[a]	.731	.697	7.40586

a. Predictors: (Constant), DIP, GP, TSP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3577.967	3	1192.656	21.745	<.001[b]
	Residual	1316.324	24	54.847		
	Total	4894.290	27			

a. Dependent Variable: C
b. Predictors: (Constant), DIP, GP, TSP

Coefficients[a]

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-25.720	25.725		-1.000	.327
	GP	.202	.208	.151	.973	.340
	TSP	.896	.336	.552	2.664	.014
	DIP	.530	.588	.221	.902	.376

a. Dependent Variable: C

Outcomes of Multiple Regression (GP, TSP, DIP)

From the multiple regression where **C** (competitiveness) is the dependent variable and **GP, TSP** and **DIP** are the predictors, the outcomes are as follows:
Adjusted R^2: 0.697. It indicates that the model explains around 69.7% of the variation in competitiveness, representing a high percentage, thus suggesting a good compatibility of the model.
ANOVA (F = 21.745, p < 0.001): The model is statistically significant, which means that the predictors (GP, TSP, DIP) significantly explain the variation in competitiveness.
Coefficients:
GP: The standardized Beta coefficient is 0.151, and p = 0.340 (insignificant). It suggests that GP does not have a statistically significant impact on competitiveness when controlled together with the other predictors.
TSP: Beta = 0.552, p = 0.014. TSP has a significant and positive influence on competitiveness, being the strongest predictor in this model.
DIP: Beta = 0.221, p = 0.376 (not significant). Although DIP strongly correlates with competitiveness, it is not significant in the regression model when the other predictors are also controlled.

Outcomes of Simple Regression (TC - mean GP, TSP, DIP)

In the case of simple regression where **C** is the dependent variable and **TC** (the average of the three indices) is the predictor, the outcomes are as follows:
Adjusted R^2: 0.657. It means that the average of the three indices explains around 65.7% of the variation in competitiveness, which is comparable to the multiple regression model.
ANOVA (F = 52.797, p < 0.001): The model is statistically significant, which means that TC explains a significant proportion of the variation in competitiveness.
TC coefficient: The standardized Beta coefficient is 0.819, $p < 0.001$, indicating a strong and significant relationship between TC and competitiveness.

Professional interpretation of the results

The Correlations indicate that all three variables (**GP, TSP, DIP**) are positively and significantly associated with competitiveness, but the magnitude of these correlations varies. TSP has the strongest correlation with competitiveness, followed by DIP and GP.
The Multiple Regression shows that when all three variables are included in the model, **TSP** remains a significant and strong predictor of competitiveness, while **GP** and **DIP** do not have a statistically significant impact. It suggests that TSP is probably the most relevant index in determining competitiveness.
Simple regression with TC shows that the average of the three indices explains a large part of the variation in competitiveness (65.7%), indicating that using an average of the indicators could be an effective approach for assessing competitiveness.

Brief conclusion

The outcomes suggest that **TSP** is a key predictor for competitiveness in the multiple regression model. At the same time, the average of the three indices of artificial intelligence provides a good explanatory capacity concerning competitiveness. However, the use of the TSP indicator seems to be the most effective in understanding the relationship with competitiveness.

Conclusions

In view of valorizing the opportunities of artificial intelligence, public employees should develop new competencies related to problem-solving, systems thinking, and strategic foresight, aiming to address rapid changes and support innovation. A career in the public sector should be embraced with enthusiasm and determination, acquiring knowledge and enhancing competencies to have a relevant impact on the public organization.

In the era of artificial intelligence, the leaders in public organizations should have a holistic approach, meaning to create a positive, empowering culture, enable AI innovation and support the changes brought by emerging technologies, identify the competence set specific for AI projects, and support training programs in view to endow the public employees with the AI-related competences, as well as to evaluate

the AI impact. Being aware of current best cases and future developments of relevant AI tools is appropriate.

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