

Synergetic approach for sustainable public service personnel management during Covid-19

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Abstract. The paper explores the application of a synergetic approach in managing public service personnel in a developing country, utilizing methods such as the six thinking hats, Delphi, analysis and synthesis, deductive, and Stanford model design thinking. It analyses sustainable development indicators, changes in personnel management within government bodies, and highlights a HDI of 0.779, Corruption Perceptions Index of 32, Income Inequality Index of 25.36%, and Gender Equality Index ranging from 0.677 to 0.714 in 2021. The findings suggest measures to activate synergetic principles, including enhancing critical and creative thinking, emotional intelligence, IQ, stress resistance, and knowledge among managers, as well as emphasizing emotional intelligence and IQ among organizational personnel. Steps for HR management in the Ukrainian public service are proposed, such as adaptation, motivation improvement, exit interviews, corporate culture development, competitive wages, and remote HRMIS technology utilization.

1 Introduction

In the 21st century of globalization and ceaseless changes, marked by the overwhelming BANI world, effective personnel management becomes a key success factor not only for commercial organizations but also for state institutions [1-3]. Therefore, it is important to find new, effective methods and approaches to public service personnel management, as this is an effective solution for countering environmental challenges and ensuring the sustainable development of the country. One of the effective methods is the application of a synergetic approach to personnel management [4-7]. Its foundation is based on the assertion that the productivity and efficiency of the organization as a whole are the results of the cumulative impact of its components, where the sum of all components is greater than their simple arithmetic sum on the one hand, and that under certain conditions, the system is capable of self-organizing to counter BANI-world challenges on the other hand. This approach reflects the concept of "synergy", which means the interaction or cooperation of two or more factors leading to a result that is better or significantly different from what could be achieved by each of the factors separately.

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In the context of personnel management, a synergetic approach means that the effectiveness of a team, department, or entire organization can be enhanced by optimizing the interaction between its members. This means not just coordinating their actions, but developing such forms of interaction in which synergy arises – when the sum of the efforts of all participants exceeds the effect that could be achieved by their separate efforts. Such an approach is capable of adapting to changing conditions, including extreme situations like the Covid-19 pandemic, as it provides for the creation of a flexible, self-organizing structure. To accomplish the objective of utilizing a synergetic approach to enhance the effectiveness of personnel management and explore means to activate synergetic approaches, several methodologies can be employed. The methods of colored hats, Delphi, analysis and synthesis, deductive reasoning, and Stanford model design thinking are particularly relevant. These methodologies provide valuable tools for selecting approaches that can effectively activate synergistic principles. By applying these methods, suitable strategies can be identified to promote synergy within the personnel management framework.

2 Literature review

The synergetic approach to personnel management has been actively studied by many scientists. These include such prominent scholars and researchers as Ma et al [9], Mariappanadar & Hochwarter [10]. The research concerned the theory of self-organization far from equilibrium, which is the basis of synergetic, as well as a number of concepts related to synergetic, including the “principle of slavery” and the concept of synergetic control [11-14]. Previous studies have addressed the problem of structural transformations of systems in the process of their evolution, which is important for a synergistic approach to personnel management. In addition, a synergetic approach to personnel management was actively developed, considering it in the context of the socio-economic system, as well as in the context of public administration [15-18]. All of them made a significant contribution to developing a synergetic approach to personnel management, which allows the creation of a harmonious and efficient management mechanism, capable of adapting to changing conditions and challenges, including the conditions of the Covid-19 pandemic.

The synergetic approach becomes particularly relevant in the conditions of the Covid-19 pandemic, which added an extra dimension to the difficulties that state institutions face. The tasks of maintaining the health and safety of employees, effective organization of remote work, adaptation to new conditions of performing official duties, ensuring a high level of motivation, and improving the skills of personnel are just a few of the problems that require new approaches. However, there is still no work on the use of a synergetic approach to personnel management in government bodies in the conditions of a BANI world in a developing country [19-20]. Therefore, the topic is relevant and timely, and the purpose of the research is to consider the possibilities of applying a synergetic approach to the management of public service personnel in the conditions of Covid-19 and its potential contribution to ensuring the sustainable development of the country.

3 Methodology

In order to identify the indicators of sustainable development in a country that is influenced by elements of personnel management, a systematic approach was employed using Edward de Bono's method in conjunction with a sticky note board. The aim was to select specific indicators from a comprehensive list.

The Delphi method was subsequently applied to determine the essential components of personnel management that activate synergetic principles. The experts involved in the study consisted of specialists from higher educational institutions within the developing country. The panel included 6 professors holding doctorates, as well as 6 associate professors who were candidates in sciences. They were tasked with selecting the elements from the authors' compiled list of necessary personnel management components that would have an impact on activating synergetic principles. To establish a comprehensive list of essential personnel management components for the application of the Delphi method, the authors used the analysis and synthesis method. They also conducted an analysis of personnel management elements in leading European countries' governmental bodies, as these countries have demonstrated high levels of efficiency in this regard. Additionally, the design thinking method according to the Stanford model was utilized to gain insights into the conditions required to activate synergetic principles within the personnel management system. This multidimensional approach provided a holistic perspective on the matter (Fig. 1).

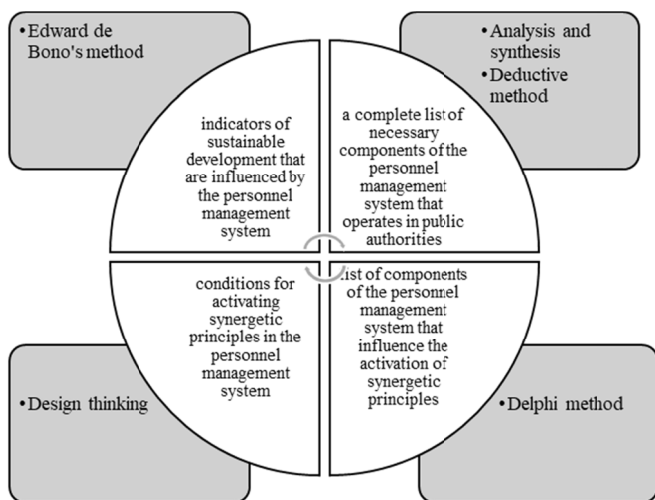


Fig. 1. Research methods used for selecting the list of components of personnel management that affect the activation of synergetic principles.

The final results were obtained by processing the expert opinions using the arithmetic mean method, taking into account the weight coefficients assigned to each expert (2 for doctors of science and 1 for candidates of science). The variation coefficient of 1 ensured the reliability of the results and the convergence of the expressed opinions. To identify the elements of the personnel management system in public authorities, the deductive method was chosen. Using Edward de Bono's method and a sticky note board, indicators of sustainable development in the country influenced by the personnel management system were selected. These indicators include:

1. Sustainable Economic Welfare Index (SEWI): This indicator considers expenditure on health, education, and other social services, as well as the negative environmental impact.
2. Gross Domestic Product change from public management (Δ GDP): This indicator reflects the impact of the personnel management system in public administration on the country's GDP.
3. Human Development Index (HDI): This indicator takes into account education, life expectancy, and GDP per capita to measure the overall human development within the country.

4. Corruption Perception Index (CPI): this index measures the level of corruption within the government and public sector of the country.

5. Income Inequality Index (Gini coefficient) (Iii): this indicator assesses the level of economic inequality within the country.

6. Gender Equality Index (Gei): this index evaluates the degree of gender equality within the country.

$$Sdi = f \begin{cases} \Delta Gdp; \\ Hdx; \\ Cpi, \\ Iii; \\ Gei. \end{cases} \quad (1)$$

The subsequent phase of the study involves examining the relationship between the selected indicators of sustainable development in the country and their impact on the HRM system. To accomplish this, the Microsoft Excel formula package was utilized to conduct a trend analysis of dependencies. This method enables a quick assessment of the correlation between the chosen indicators and facilitates the elimination of those indicators with the weakest correlation. The utilization of this method offers the advantage of ensuring a high-quality analysis of the impact of the most significant indicators on the level of sustainable development.

4 Results and discussions

Table 1 presents changes in indicators from 2015 to 2021, as this period covers the reform of civil service in the developing country, including changes in approaches to personnel management systems, and the data is freely available.

Table 1. Change in sustainable development indicators in Ukraine in 2015-2021.

Year	Sustainable Development Index, SDI (Sdi), ranking assessment	Change in GDP from public governance (ΔGdp), %	Human Development Index (Hdx)	Corruption Perceptions Index (Cpi), scores	Income Inequality Index (Iii), %	Gender Equality Index (Gei)
2015	36	-9,8	0,747	27	25,5	0,678
2016	39	2,4	0,743	29	24,6	0,694
2017	40	2,5	0,751	30	27,7	0,677
2018	41	3,5	0,751	32	26,3	0,707
2019	47	4,1	0,779	30	23,5	0,676
2020	27	-4	0,779	33	28,1	0,714
2021	37	4	0,779	32	25,36	0,707
Dependencies ($y=f(x)$)						
Generalized equation	$y = 0,2263x^2 + 1,8432x + 31,966$	$y = -8E+06x^3 + 2E+07x^2 - 1E+07x + 3E+06$	$y = -1,2013x^2 + 71,29x - 1014,4$	$y = -1,7052x^3 + 131,79x^2 - 3390,1x + 29066$	$y = 2E-06x^4 - 0,0003x^3 + 0,0187x^2 - 0,5085x + 5,7707$	
R ²	0,7446	0,0922	0,6958	0,8648	0,4748	
Correlation	$Sdi = f(\Delta Gdp)$	$Sdi = f(Hdx)$	$Sdi = f(Cpi)$	$Sdi = f(Iii)$	$Sdi = f(Gei)$	
	<input type="checkbox"/> Existing relationship <input type="checkbox"/> Absence of relationship					

As illustrated in Table 1, the Sustainable Development Index in Ukraine exhibited fluctuations between 2015 and 2021. The country experienced a gradual decline in its ranking, starting from the 36th position in 2015 and descending to the 47th position in 2019. However, there was a significant leap in 2020, propelling Ukraine to the 27th position, although it subsequently dropped to the 37th position in 2021. In terms of GDP from public administration, Ukraine witnessed diverse changes. It initially recorded negative growth (-9.8%) in 2015, followed by periods of growth and a decline (-4%) in 2020 due to the impact of the COVID-19 pandemic. Notably, this indicator exhibited positive growth in 2021, reaching 4%.

The Human Development Index (HDI) displayed a consistent increase throughout the entire period, rising from 0.747 in 2015 to 0.779 in 2019, 2020, and 2021. The Corruption Perceptions Index witnessed variations, starting at 27 points in 2015, increasing to 33 points in 2020, and subsequently returning to 32 points in 2021. The Income Inequality Index experienced a decrease from 25.5% in 2015 to 23.5% in 2019, followed by an increase to 28.1% in 2020 and a subsequent decrease to 25.36% in 2021. The Gender Equality Index fluctuated over the period but generally remained within the range of 0.677 to 0.714.

Overall, Ukraine has made notable progress in specific aspects of sustainable development, particularly driven by decentralization reforms, including changes in personnel management. These reforms encompass mandatory qualification enhancements and modifications in approaches to motivating and evaluating the performance of personnel. In practice, the elements of personnel management are interconnected, serving as the foundation for achieving synergy.

To activate synergistic principles and achieve high personnel efficiency in HR management, the following actions are recommended:

- respond promptly to changes in the organization's internal and external environment.
- provide clear tasks to personnel for effective work organization.
- accurately assess the training and professional development needs of staff.
- ensure a quality evaluation of staff performance results.
- establish appropriate criteria to assess personnel effectiveness and make adjustments when necessary.
- continuously monitor and replenish the talent pool.
- implement effective measures to support personnel adaptation.
- facilitate quality communication regarding personnel management matters.
- develop effective methods of staff motivation based on internal and external influences, selecting the most suitable approaches for each situation.
- ensure a high level of personnel security.
- monitor the workplace's psychological climate to prevent bullying or harassment.
- address qualification asymmetry among staff members.
- collaborate with higher education institutions for personnel recruitment.
- collaborate with the National Agency of Ukraine for Civil Service in managed recruitment and implementing sector reforms.
- monitor and promptly address risks that may affect effective personnel management.

By implementing these actions, HR management can activate synergistic principles and enhance personnel efficiency.

It has been established that the structure of personnel management in the public service of Ukraine consists of recruitment, control (annual performance evaluation of assigned tasks), motivation (which is currently undergoing improvement due to the ongoing reform of the public service of Ukraine), and professional development. During recruitment, compliance with the staffing table is mandatory, and the salary depends on grades, allowances, and bonuses.

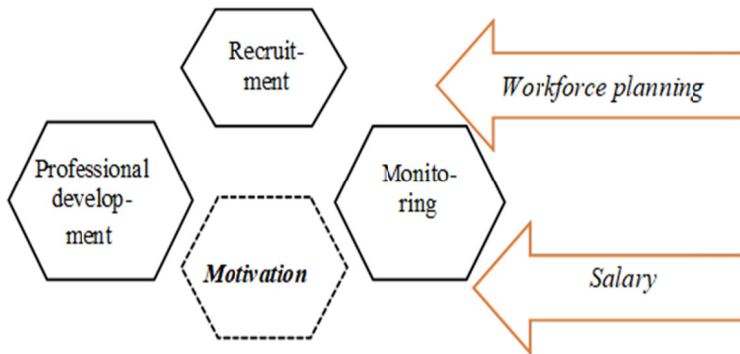


Fig. 2. Components of a developing country's public service personnel management system.

It has been determined that in order to effectively implement synergistic principles in the personnel management system of a developing country's public service, the following prerequisites must be fulfilled [14]:

1. **Leadership Requirements:** Leaders should possess a high level of critical and creative thinking, emotional intelligence, cognitive development quotient, stress resistance, and the necessary knowledge to construct a system based on synergistic approaches.

2. **Personnel Qualifications:** Organizational personnel should have average to high levels of emotional intelligence, cognitive development quotient, and the required knowledge to carry out their professional responsibilities effectively. They should also demonstrate average to high levels of critical and creative thinking.

3. **Structural Improvements** within the structure of Ukraine's public service HR system, which operates on synergistic principles, several improvements need to be implemented, including:

- Incorporating adaptation programs for civil servants into the system.
- Ensuring further enhancement of motivation strategies for civil servants.
- Conducting exit interviews with departing civil servants.
- Establishing an effective corporate culture for civil servants.
- Raising remuneration levels to be competitive.

4. **Active utilization of remote HRMIS (Human Resource Management Information System) technologies.**

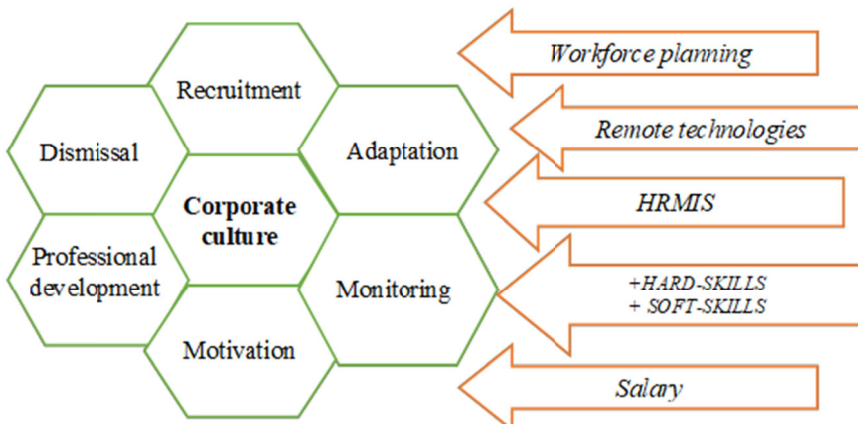


Fig. 3. Structure of HR management in a developing country's public service operating based on synergistic approaches.

When examining the structure of HR management in a developing country's public service, which operates under the framework of synergistic approaches, it is imperative to emphasize the following equation:

$$Sdi = f(Dase), \tag{2}$$

where Sdi – Sustainable Development Index, a rating assessment; Dase – represents the degree of activation of synergistic effects, scaled from 0 to 1.

For the studied period (2015-2022), the dependency of the Sustainable Development Index for Ukraine on the degree of activation of synergistic effects can be described by a polynomial trend (3) and is characterized by a high density of connection ($R^2 = 0,8951$):

$$Sdi = -18,093 Dase^2 - 7,0514 Dase + 46,737 \tag{3}$$

Personnel management in government agencies plays a vital role in driving the overall sustainable development of a country. Consequently, the corporate culture within the public service of a developing country should be effectively governed by the personnel management system, guided by the following key principles:

- professionalism: civil servants must possess the requisite knowledge and skills to proficiently carry out their responsibilities.
- openness and transparency: the public service should be accessible to citizens, ensuring transparency in actions and decision-making processes.
- accountability: civil servants have a responsibility to be answerable for their decisions and actions, as well as ensuring the quality of services provided to citizens.
- ethics and legality: civil servants are expected to adhere to legal and ethical norms in their conduct, working in the best interests of both citizens and the state.
- collaboration: civil servants should actively collaborate with other governmental branches, businesses, and the public to achieve shared objectives.

In addition, it is crucial to elevate the remuneration of civil servants to a competitive level. This, alongside the aforementioned measures, will serve as a significant lever to enhance the effectiveness of their work.

4 Conclusions

To ensure sustainable development in developing countries during the Covid-19 pandemic, activating synergistic approaches is crucial. This entails promoting qualities such as critical and creative thinking, emotional intelligence, cognitive development, stress resilience, and knowledge among leaders who are responsible for establishing synergistic systems. Similarly, fostering average to higher levels of emotional intelligence, cognitive development, knowledge, and critical and creative thinking among employees is essential.

In the context of the Ukrainian public service, which operates based on synergistic approaches, several measures should be implemented, including adapting public servants to the organizational structure, enhancing motivation, conducting exit interviews, establishing an effective corporate culture, raising remuneration levels, and leveraging remote Human Resource Management Information Systems (HRMIS) technologies.

Further research should concentrate on developing an implementation algorithm for these recommendations within the practical framework of personnel management in developing countries. Additionally, evaluating and assessing the effectiveness of the proposed improvements is necessary.

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