

## EMPIRICAL INVESTIGATION OF PUBLIC SERVICE PERFORMANCE IMPROVEMENT FACTORS

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**Abstract:** Public organizations in developing countries are losing public trust due to the weak delivery of community services. The main concern of the countries is to seek ways to meet public expectations regarding the effective and efficient delivery of public department services. The past research revealed the multiple factors that could improve public department service performance. In this regard, the current study will see the contribution of factors, such as organizational culture, organizational structure, digital transformation, and service innovation, in the service performance of public departments of developing countries like Pakistan. The partial least squares structural equation modeling (PLS-SEM) was used to analyze the 382 survey responses data. However, the finding of the study revealed the moderating role of digital transformation and service innovation on the relationship between organizational structure, organizational culture and service performance. Furthermore, the current study found an insignificant relationship between organizational structure and service performance; on the other hand, organisational culture significantly impacts service performance. However, the findings of this study stated that digital transformation strategy, service innovation and organizational culture are important variables for employee service performance in the Motorway Police of Pakistan.

**Keywords:** Digital Transformation; Service Innovation; Organizational Culture; Organizational Structure; Service Performance

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### Introduction

From the management perspective, any country's local and federal governments prioritise improving public services (Chapell et al., 2005). Over the time, user demands and reliance on public services are increasing. On the other side, public

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service provision has involved local communities in developing closer ties with citizens and meeting their needs. However, public organizations should provide the community with efficient, effective and on-time services. In other words, the community is expected to have a high standard of services from public organizations (Boyne and Walker, 2010). The successful delivery of services to the public improves the reputation of public organizations. However, the advanced world maintained good governance and checks and balances of public organizations. Further, they maintained the good service performance of public organizations; alternatively, the developing countries, such as Pakistan, public organizations suffer from corrupt governments, lack of budget, poor revenue generation, political instability and weak public services delivery (Rashid et al., 2021).

As a result, the community's trust in public organizations, more specifically in developing countries, such as Pakistan, becomes very weak and continues to decline day by day. Although the government of Pakistan, the Right to Services Act 2014 was implemented to improve the public departments' service performance. This act makes service servants liable to penalties if they fail to deliver the service effectively, efficiently, and on time to the public without any excuse (Khawaja and Khalid, 2022). Furthermore, the main stakeholders, such as politicians and bureaucrats, just show their rent-seeking rather than delivering effective public services. In other words, they are using the public department for their interests, which builds the trust deficit between public departments and the public. Past studies stressed that regaining public trust in developing countries required delivering high-quality services to the general public.

In line with developing countries, the Pakistan federal and provincial governments are restructuring the old departments and introducing new departments like motorway police, NADRA, Punjab emergency services and traffic wardens. Their main purpose is to deliver effective and efficient services to the community on time (Kalyar et al., 2019). The current study will evaluate the best service provider in the public department of Pakistan. According to Arain and Arain (2016), the national highways and motorway police of Pakistan (NHAndMP) have been recorded as the 13 most corruption-free departments in the world. In other words, the study's main objective is to see whether the NHAndMP is either performing up to standard or observing a declining trend. However, as past literature has shown that public departments' service performance is not up to standard in Pakistan, this study will try to propose a solution for improving service performance in the public sector.

Consequently, the past research discussed the multiple factors influencing the service performance of public departments. Anyway, the current study will see the contribution of organizational culture, organizational structure, digital transformation and service innovation in the service performance of NHAndMP in Pakistan. According to Harahap, Ritonga, and Sinaga (2021), organization can be the influential factor for higher service performance of public departments. Besides, organizational structure can be a potential contributor to service performance. Moreover, service innovation and digital transformation strategy found a positive

direct relationship with the performance of the organization (Hameed, Nisar, and Wu, 2021). Furthermore, service innovation and digital transformation strategy can expedite the relationship between organizational culture, organizational structure, and service performance (Vendrell-Herrero et al., 2021). Besides, Tarafdar and Qrunfleh (2017) stated that the major concern of this research is to verify the role of service innovation and digital transformation strategy effects on organizational culture, organizational structure and the performance of public organization services. Thus, based on past literature, the present study's main objective is to evaluate the moderating role of the digital transformation strategy and service innovation on the relationship among organizational culture, organizational structure and service performance of public organizations in Pakistan. Additionally, a few studies investigate the moderating role of the digital transformation strategy and service innovation on the relationship among organizational culture, organizational structure and service performance of public institutes of Pakistan, such as NHandMP under practice-based view theory (PBV).

Therefore, the present study will try to answer how organizational structure and culture will moderate the role of digital transformation strategy and service innovation in the performance of public service organizations in Pakistan. In terms of the organization of the research work, after the introduction section, this study will cover the literature review, methodology, data analysis and findings, results in discussion, implications of the study and limitations and future recommendations.

### **Literature Review**

A number of studies have been published on the performance of public institutions, but only a few studies have investigated the service performance of organizations. Basically, the success of any government depends on the effective implementation of public sector services. However, the evaluation of performance of public service organization is a major concern for any country. Additionally, any slight changes in service performance may positively and negatively influence the community. Service performance refers to long-term and consistent service behaviour which totally depends on general public requirements (Lin et al., 2020). To address the research gap and understanding of public service performance, the current study investigates the relationship between organizational structure, organizational culture and service performance with moderating role of digital transformation strategy and service innovation.

The organizational structure refers to rules and procedures, decision-making approaches, reporting mechanisms, and any organisation's centralized and decentralized management styles (Lincoln et al., 1986). To achieve a sustainable competitive advantage, successful strategies must be based on the organization's most distinctive capabilities and skills (Naidu and Prasad, 1994). Consequently, it's not enough to consider organizational structure exclusively as a tool for carrying out a strategic plan; instead, managers should view it as a resource that can aid in

formulating strategy and, ultimately, improve results (Pertusa-Ortega et al., 2010; Lis and Szczepanska-Woszczyna, 2015).

However, most researchers stressed that the organizational structure is the influential factor for organization success. According to Felício, Samagaio and Rodrigues (2021), the organizational structure would potentially contribute to higher public service performance. Thus, this study proposes the following hypothesis.

*H1: Organizational structure has a significant impact on service performance.*

The past literature discussed that the organization's long-term set of core values and beliefs define organizational culture (Štreimikienė, et al., 2021). Many researchers have concluded that an organizational culture enhances the effectiveness of the organization success (Nongo and Ikyanyon, 2012). Several studies have examined the impact of organizational culture on performance within different variable combinations (Acar and Acar, 2012). Organizational culture could be a potential factor for any organization which can create a competitive advantage (Acar and Acar, 2014). However, some authors stressed organisational culture's game changer element for any organization (Eren et al., 2003).

The organisational culture represents how organisations utilise their resources effectively and involve their employees in decision-making (Reichers and Schneider, 1990). In other words, a weak organizational culture could also damage the organization's success. Hence, the importance of organizational culture cannot be neglected (Ang et al., 2004). This can enhance the organization service performance. Hence, the following hypothesis is proposed.

*H2: Organizational culture has a significant impact on service performance.*

Digital transformation strategy in many organizations refers to collaboration among people and digital technology used for programming in different business activities and methods. This strategy makes computer-oriented organizations (Borangiu, et al., 2019). Basically, digital transformation is a process that has the potential to reshape entire societies and economies (Șerban, 2017). The information technology mechanism and digital tools like social media is helping organizations for better interact with their customers and successfully deliver service (Androniceanu and Georgescu, 2021; Androniceanu, et al., 2021). However, the customer experiences are enhancing, and a company's value increases due to digital business success (Purchase, et al., 2011). Furthermore, the customers' relationship programmers and data-driven technology can benefit from digital transformation in some ways, such as big data management.

Additionally, digital transformation in an industry's operations can increase efficiency, allowing it to compete with other multinational corporations. Specific support tools are required in industries where specific characteristics influence the digital transformation process (Van Veldhoven and Vanthienen, 2019). This means organizations can also improve their employees' skills to carry out the necessary digital functions. While many organizations have partial financial funds for investing in new technologies, management expects a clear, profitable return on investment in the digital transformation process (Pelletier and Cloutier, 2019).

According to Chantias and Hess (2016), from a more extensive point of view, digital transformation is an interaction that can remake whole economies and social orders. Digital tools like web-based media can uphold firms' collaborations with clients, while IT frameworks can help convey items, labor, and products more adequately and proficiently. However, the use of digital transformation in organizational structure can effectively change public service performance (Tangi, et al., 2021). Along with organizational structure, the organizational culture also changes its dynamics through digital transformation, which can bring higher public service performance (Armenia, et al., 2021). Thus, the above literature discussion brings this study to propose the following hypothesis regarding the influential moderating role of digital transformation on the relationship between organizational culture, organizational structure, and service performance.

*H3: Digital transformation strategy moderates the relationship between organizational structure and service performance.*

*H4: Digital transformation strategy moderates the relationship between organizational culture and service performance.*

The service innovation brings total or incremental innovation into services. However, past studies discussed the positive role of service innovation in service performance. Basically, service innovation contributes to service performance by giving benefits to existing consumers and expanding their scope through providing new services (Sebastiani and Paiola, 2010). In other words, service innovation, regardless of incremental or radical innovation type, can increase service performance (Cheng and Krumwiede, 2012).

The community is the lifeblood of any service provider organization, and organizations are constantly looking for new ways to improve their services successfully. On the other hand, many challenges arise when managing innovation within an organization because the required activities are time-consuming and complex (Giannopoulou et al., 2011). The ability to innovate, organizational cultures and organizational structure influence the employees' behavior, working styles, service development schemes and outcomes of services (Lam, et al., 2021). Besides, every organization will have different cultures and characteristics, which could impact the basic active capabilities needed to improve innovation (Limaj and Bernroider, 2017).

Moreover, some researchers stressed that the organization should introduce innovative programmers which fulfil consumers' demands efficiently, effectively, and on time. In other words, service innovation will not only improve the service performance innovatively, but it will also improve the organizational culture and structure. Hence, on the above discussion, this study is hoping for the positive moderating role of service innovation on the relationship between organizational culture and organizational structure.

*H5: Service innovation moderates the relationship between organizational structure and service performance.*

*H6: Service innovation moderates the relationship between organizational culture and service performance.*

***Research framework***

The underpinning theory of this study is a practice-based view theory (PBV), which is the updated form of resource-based view theory (RBV). The PBV refers to “a defined activity or set of activities that a variety of firms might execute”, which is “publicly known, imitable, and amenable to transfer across the firms” (Bromiley and Rau, 2014). The PBV differs from RBV, which focuses on organizational performance changes due to “imitable and transferable practices, where practices are an established activity or set of activities that various companies may perform” (Rehman Khan and Yu, 2021). Thus, the current study is taking organizational culture, organization structure, digital transformation strategy, and service innovation, which are publicly famous, common, and amendable practices. These practices could significantly contribute to organizational public service performance. However, public service performance was taken as an endogenous variable, organisational culture and structure as exogenous variables, and digital transformation and service innovation as moderating variables in this study. Practices, such as organizational culture, organizational structure, digital transformation and service innovation, are imitable and amendable to transfer across firms. Thus, according to PBV theory, imitable practices such as organizational culture, organization structure, digital transformation strategy, and service innovation could help explain the service performance differences in NHandMP. The research framework and definition of the terms can be seen in Figure 1 and Table 1, respectively.

**Table 1. Operational definition of the constructs**

Construct	Definition	Reference
Service performance	Public service performance is commonly measured through staff perceptions of output.	Andrews, Boyne, Law, and Walker (2009)
Organizational culture	Process of beliefs, habits, values, and behaviour that shape individuals' behaviour within an organization is known as organizational culture.	Azeem, Ahmed, Haider, and Sajjad (2021)
Organizational structure	The organizational structures are usually modified and adapted to handle significant changes in the working environment to maintain a high performance.	Bieberstein, Bose, Walker, and Lynch (2005)
Digital transformation strategy	The organizational strategy formulated and executed by leveraging digital resources to create differential value for firm and customers.	Hess, Matt, Benlian, and Wiesböck (2016)
Service innovation	Service innovation is the development of a new service that is perceived as new and helpful for customers.	Grawe, Chen, and Daugherty (2009)

### Research Methodology

This is a cross-sectional study. The data of this study were collected from the employees of public departments (national highways and motorway police) of Pakistan. The total population for this study is 12000 employees, and 800 employees have been contacted through online modes, such as WhatsApp, E-mail and Facebook. The snowball sampling technique was used to distribute the questionnaire among the respondents. However, a total of 410 responses were received; among them, 28 responses were discarded due to misleading values, leaving a final sample size of 382 employees with 47.75 response rate. Besides, the justification of sample size is explained using StatisME SEM-PLS software. This software proposed three techniques to drive the actual sample size such as "The Minimum Method", "Inverse Square Root Method" and "10-Times Rule Method" (StatisME, 2022). However, this study found a minimum sample size of 33 using minimum r-square methods. On the other side, inverse square root methods revealed a minimum sample size of about 50, and the last method 10-times rule method, found the minimum sample size of about 20 responses required to run the analysis. However, the current study sample size fulfilling the generalization criteria.

The scale of the study is adopted from past studies, such as the questionnaire on organizational structure with 12 items taken from the study of Marín-Idárraga and González (2021). The scale of organizational culture with 8 items is taken from the study of Azeem et al. (2021). Besides, the digital transformation scale adopted from the study of Hess et al. (2016) with 11 items. Moreover, the service innovation scale with 5 items was adopted from the study of Grawe et al. (2009). The scale of service performance with 7 items was taken from the study of Borucki and Burke (1999). The 5-point liker scale has been used to measure the constructs. The complete scale of the study can be seen in appendix 01.

The data analysis has been conducted using the partial least square equation modeling (PLS-SEM). The PLS-SEM analysis was done in statistical software named, SmartPLS3 (Ringle, Sarstedt and Straub, 2012). According to Hair, Risher, Sarstedt, and Ringle (2019), the smartPLS is very useful for validating the measurement and structural model using the partial least square structural equation modeling technique. Furthermore, PLS-SEM has better predictability for evaluating the small sample size and theoretical framework testing. Moreover, smartPLS is also dealing with data normality issues and complex structural models.

This study has collected data about exogenous (public performance) and endogenous (organizational structure, organizational culture, digital transformation strategy and service innovation) constructs from a single source through a survey; however, there is a possibility of response biases, which can disturb the data. However, Harman's single-factor method was used to compute the common method bias (CMB), and the evaluation revealed about 45.607% of the total variance. Hence, there is no issue found regarding CMB. Basically, a value to total variance should not be higher than 50% (Kock, 2020), and the value of this study was found in the acceptable range.

### **Research Results**

In respect of descriptive analysis, the SPSS software was used to draw the results. The demographic profile of respondents from the Motorway Police demonstrated that 274 were male, i.e., 82.4%, and 108 females, i.e., 17.6%. Regarding age, 17.6% of respondents were aged between 20 and 30, and 72.9% of employees were between 30 and 40 years old, followed by 9.4% from the above 40 years old groups.

Moreover, in respect of the experience of employees, some employees have experience between 1 to 5 years in the organization, which is 9.0% of the total sample size, and most employees' experience recorded more than 5 years, which is 90.0% of the total sample size. Furthermore, in respect of the education level of employees, most of the respondents had bachelor's levels. In view of the construct, descriptive results show that service innovation has the lowest mean of (0.048) while digital transformation strategy has the highest mean value of (0.387). Moreover, the entire values of standard deviations fall between the range of (0.026) and (0.145), establishing acceptable variability within the data set. Furthermore, the response rate of the study is recorded as 80%.



For inferential analysis, the Smart PLS 3.0 software with the partial least square technique was adopted to draw the conclusion of the study. The two main tests have run on smartPLS 3: measurement model and structural model analysis. The measurement model consists of reliability and validity analysis and structural model analysis having path coefficients analysis.

**Measurement model**

This is a reflective-reflective model. The treatment of reflective-reflective order can be based on items and construct’s reliability and validity. This study uses Cronbach alpha, composite reliability, and Rho\_a constructs internal consistency. The threshold value of Cronbach alpha, composite reliability, and Rho\_a should be equal or greater than 0.70, respectively. Hence, all values of constructs are more than threshold values, and the results can be seen in Table 2. The internal consistency of the model is achieved. Moreover, the convergence validity of constructs has been evaluated using the average variance extract (AVE) criteria. According to Hair Jr, et al., (2017), the AVEs values should be equal or greater than 0.50. Hence, the results found all values greater than 0.50; thus, the convergence validity of the model is achieved, and the results can be seen in Table 2.

The Heterotrait–Monotrait ratio of correlations (HTMT) criterion has been used to evaluate the model validity. The results show that the values are less than 1.0. Hence, the validity of the model is achieved. The results can be seen in Table 3.

**Table 2. Constructs reliability and validity results**

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital transformation strategy (DTS)	0.987	0.988	0.988	0.866
Organizational Culture (OC)	0.922	0.978	0.946	0.712
Organizational Structure (OS)	0.989	0.989	0.990	0.918
Service Innovation (SI)	0.985	0.989	0.986	0.801
Service Performance (SP)	0.972	0.979	0.977	0.860

**Table 3. Discriminant (HTMT criterion) validity results**

	DTS	OC	OS	SI	SP
DTS	0.931				
OC	0.982	0.844			
OS	0.988	0.982	0.958		
SI	0.838	0.810	0.838	0.895	
SP	0.977	0.973	0.976	0.829	0.927

***The Structural Model***

After the successful evaluation of measurement model, the current study has evaluated the structural model to draw the decision of the study. However, the current study has conducted the path coefficients analysis using bootstrapping at 5000 subsamples, at 1.96 t-statistics. The results of the direct relationship can be seen in Table 4. Furthermore, the interaction results can be seen in Table 5 as well. The hypothesis rejected their t-statistics value of less than 1.96.

**Table 4. Direct relationship results**

Hypothesis	Beta	Standard Deviation	T statistics	P-Values	Decision
H1: organizational culture to service performance	0.289	0.119	2.437	0.015**	Supported
H1: organizational structure to service performance	0.266	0.145	1.836	0.067ns	Not supported

**Note:** \*, \*\*, ns, significance level of 0.05 and 0.01, non-significant, respectively.

**Table 5. Moderation results**

Hypothesis	Beta	T statistics	P-Values	Decision
H3: digital transformation on organizational structure to service performance	0.291	2.731	0.007**	Supported
H4: digital transformation on organizational culture to service performance	0.337	2.348	0.019**	Supported
H5: service innovation on organizational structure to service performance	0.210	2.266	0.024*	Supported
H6: service innovation on organizational culture to service performance	0.182	2.768	0.006**	Supported

**Note:** \*, \*\*, ns, significance level of 0.05 and 0.01, non-significant, respectively.

### Discussion and Conclusion

This research is conducted in Pakistan to examine the service performance among employees of NH and MP, especially to see the moderating role of digital transformation strategy and service innovation on the relationship of organizational culture, organizational structure, and service performance. However, the influence of organizational culture on service performance was found to be significant. Hence, hypothesis H1 is accepted, and the findings are consistent with studies of Acar and Acar (2014). The organizational culture has a positive impact on service performance. Basically, changes in organizational culture also bring changes in firm performance; hence, the researchers, policymakers and management of the firm cannot neglect the positive role of culture. Thus, organizational culture is a substantial intangible resource that affects any organization's performance.

On the other side, H2 is rejected because this study found an insignificant relationship between organizational structure and service performance. The results oppose the finding of the study of Skaggs and Galli-Debicella (2012). The insignificant result between organizational structure and service performance can occur due to response biases. Besides, the least interest of management in organization structure also can be the reason for the least contribution of organizational structure to service performance. As per the theory, the organizational structure is a valuable resource for the competitive advantage of any organization.

Anyway, the top management of NH and MP should focus on improving the organizational structure for better results or delivery of service to end users.

Furthermore, the moderating role of digital transformation strategy on the relationship between organizational structure, organizational culture and service performance has been examined. The results of the study revealed the significant moderating role of digital transformation strategy on the relationship of organizational structure, organizational culture, and service performance of NH and MP in Pakistan. Hence, hypotheses 4 and 5 are accepted, and the results confirm the findings of the studies of Chatterjee, et al., (2021). The findings of these two hypotheses (H4 and H5) stated that if the management and employees of NH and MP can understand the value of digital technology transformation in the organization and that digital transformation can improve the organization and their performance beyond their expectations, they will not be hesitated to adopt the digital transformation strategy. As per this study's findings, digital transformation enhances the relationship among organizational culture, organizational structure and service performance of the organization, although this study found no relationship between organizational structure and service performance. However, this is the core responsibility of the management. They should enhance the trust of employees in the use of digital technologies. As stated above, this can bring higher performance for the organization.

Moreover, based on the analysis, service innovation significantly moderates the relationship among organizational structure, organizational culture and Service Performance. Hence, hypotheses 5 and 6 are accepted, and their findings align with the studies of Vendrell-Herrero et al. (2021), respectively. The service innovation, closed or open innovation, is the crucial factor that connects the organizational culture, structure and service performance of NH and MP. Basically, improvement in the culture and structure of the organization is the outcome of service innovation. Service innovation is bringing changes in organizational working style. Furthermore, service innovation is bringing changes in the culture and structure of an organization which can enhance the service performance of the organization. Hence, service innovation is the crucial factor for the strong link among organizational culture, organizational structure and service performance of the organization.

This study has multiple implications. The focus of the study that how different factors could improve the service performance of public organizations in developing countries. In order to achieve organizational success in respect of higher public service performance, public organizations should develop their value mechanism. However, the findings of this study show that establishing a common culture across the local government can be difficult. Every public department has its unique working style, practices, and human resources. In other words, for the achievement of any specific objectives on their agenda, it is suggested by current study findings that every public department should develop its own working culture and structure. Hence, the organization culture, digital transformation strategy and service

innovation are important for the higher public service performance of NH and MP in Pakistan.

Furthermore, it is suggested that academicians, policymakers, and practitioners should consider digital transformation, organizational culture and service innovation before any decision or administration toward higher public service performance, especially in the context of developing countries such as Pakistan. Furthermore, it is also suggested that digital innovation could bring a better solution to public problems in a short time. However, the management of organizations should utilize the maximum potential of digital technology within the organizations. Furthermore, they should involve all employees in using digital technology to get better results in service performance.

In respect of theory, this study contributes to PBV. This is the first study that investigated the moderating role of digital transformation strategy and service innovation on the relationship of organization structure, organizational culture, and public service performance in the context of Pakistan under PBV theory. Furthermore, this study claims that this research model is unique to improving service performance, especially in Pakistan. This may be considered an important contribution to existing literature.

This is a cross-sectional study; future studies can collect the data using a longitudinal approach. This study was conducted in a developing country such as Pakistan. The future study can validate the present study's research framework in developed countries. Furthermore, this study was conducted in the service sector, and future studies could consider manufacturing or both sectors. Moreover, future research would involve more variables in the current research framework, such as leadership and governance role. One more recommendation is that future studies could consider the resource base view theory to validate the current research framework.

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## BADANIE EMPIRYCZNE CZYNNIKÓW POPRAWY WYDAJNOŚCI SŁUŻB PUBLICZNYCH

**Streszczenie:** Organizacje publiczne w krajach rozwijających się tracą zaufanie społeczne z powodu słabego świadczenia usług społecznych. Głównym problemem tych krajów jest poszukiwanie sposobów na spełnienie oczekiwań społecznych dotyczących skutecznego i wydajnego świadczenia usług przez urzędy publiczne. Dotychczasowe badania ujawniły wiele czynników, które mogą poprawić wydajność usług publicznych. W związku z tym



obecne badanie będzie dotyczyć wpływu czynników, takich jak kultura organizacyjna, struktura organizacyjna, transformacja cyfrowa i innowacje usług, na wydajność usług departamentów publicznych krajów rozwijających się, takich jak Pakistan. Modelowanie równań strukturalnych metodą cząstkowych najmniejszych kwadratów (PLS-SEM) zostały wykorzystane do analizy danych z 382 odpowiedzi na ankiety. Wyniki badania ujawniły jednak moderującą rolę transformacji cyfrowej i innowacji usługowych w relacji między strukturą organizacyjną, kulturą organizacyjną a wydajnością usług. Ponadto w obecnym badaniu wykazało nieistotny związek między strukturą organizacyjną a wydajnością usług; z drugiej strony kultura organizacyjna znacząco wpływa na wydajność usług. Jednak wyniki tego badania wykazały, że strategia transformacji cyfrowej, innowacje w usługach i kultura organizacyjna są ważnymi zmiennymi wpływającymi na wydajność usług pracowników w Policji Autostradowej w Pakistanie.

**Słowa kluczowe:** transformacja cyfrowa; Innowacje usługowe; Kultura organizacyjna; Struktura organizacyjna; Wydajność serwisu

### 公共服务绩效提升因素的实证研究

**摘要：**由于社区服务交付薄弱，发展中国家的公共组织正在失去公众信任。各国的主要关注点是设法满足公众对有效和高效地提供公共部门服务的期望。过去的研究揭示了可以提高公共部门服务绩效的多种因素。在这方面，当前的研究将看到组织文化、组织结构、数字化转型和服务创新等因素对巴基斯坦等发展中国家公共部门服务绩效的贡献。偏最小二乘结构方程模型 (PLS-SEM) 用于分析 382 个调查响应数据。然而，研究结果揭示了数字化转型和服务创新对组织结构、组织文化和服务绩效之间关系的调节作用。此外，目前的研究发现组织结构与服务绩效之间的关系微不足道；另一方面，组织文化显著影响服务绩效。然而，这项研究的结果表明，数字化转型战略、服务创新和组织文化是巴基斯坦高速公路警察员工服务绩效的重要变量

**关键词：**数字化转型；服务创新；组织文化；组织结构；服务表现

**Appendix 1. Scale of the study**

<b>Service performance</b>		
<b>No</b>	<b>Items details</b>	<b>Reference</b>
1	Being friendly and helpful to customers.	Borucki and Burke (1999)
2	Approaching customers quickly.	
3	Asking good questions and listening to find out what a customer wants.	
4	Being able to help customers when needed.	
5	Pointing out and relating item features to a customer's needs.	
6	Suggesting items customers might like but did not think of.	
7	Explaining an item's features and benefits to overcome a customer's objections.	

<b>Organizational Structure</b>		
<b>No</b>	<b>Items details</b>	<b>Reference</b>
1	In our organization, the job is grouped according to the functions to be done	Marín-Idárraga and González (2021)
2	In our organization, the processes and objectives are defined for each area of functional responsibility (for example, operations, administrations, HRM etc.)	
3	In our organization, the hierarchy of authority is defined at more than one organizational level	
4	In our organization, there are policies and rules defined on how tasks should be performed	
5	In our organization, processes are standardized and normalized to create job routines	
6	In our organization, the operational processes are documented or digitized to allow their control	
7	In our organization, the decision-making process focuses on the top management	

8	In our organization, the functional managers do not have autonomy to manage their budget	
9	In our organization, the job and responsibility of organizational agents are defined by the top management	
10	In our organization, the current knowledge and skills are used to improve familiar products, processes and technologies	
11	In our organization, the knowledge and skills are strengthened for projects that improve the efficiency of existing activities	
12	In our organization, the skills are developed to exploit mature technologies that improve the productivity of current innovation operations	

**Organizational Culture**

<b>No</b>	<b>Items details</b>	<b>Reference</b>
1	We have informal norms and rules which are to be followed by everyone.	Azeem et al. (2021)
2	Instructions and regulations are needed to govern every process of work.	
3	Customers' interests are never ignored in the decision-making of an organization.	
4	We constantly improve our methods of work to gain advantages over rivals.	
5	The agreement is easily achieved even concerning complex problems in the organization.	
6	In a group, everyone must put maximum effort to achieve a common goal.	
7	Information is available to everyone. One can get any needed information.	
8	New ideas must be applied immediately; otherwise, they become old and obsolete.	

<b>Digital Transformation Strategy</b>		
<b>No</b>	<b>Items details</b>	<b>Reference</b>
1	Sufficient time for training	Hess et al. (2016)
2	The degree of easy to understand of training content	
3	The thoroughness of training content	
4	Training content is helpful in portal usage	
5	The easy to use of firm's service management	
6	The easy to use of firm's information management	
7	The accessibility of portal information	
8	Reliability degree of back-management service	
9	Responsiveness in administrative support	
10	Assurance of service quality	
11	Content of services providing required by users	

<b>Service Innovation</b>		
<b>No</b>	<b>Items details</b>	<b>Reference</b>
1	Service innovation is readily accepted in organizational management	Grawe et al. (2009)
2	Our organization top management gives special emphasis on service innovation	
3	Our organization constantly seeks new ways to better service our customers	
4	Our organization is able to change/modify our current service approaches to meet the special requirements of customers	
5	Compared to other government service provider departments, our organization is able to come up with new service offerings	