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Contact to corresponding author: Ilona Bartuseviciene, ilona.bartuseviciene@mr.uni.eu

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Mindaugas Butkus

Mykolas Romeris University, Lithuania

 orcid.org/0000-0003-2381-5440


Giovanni Schiuma

Libera Universita Mediterranea, Italy

 orcid.org/0000-0003-4990-9330


Ilona Bartuseviciene

Mykolas Romeris University, Lithuania

 orcid.org/0000-0001-6260-9370

Ona Grazina Rakauskiene

Mykolas Romeris University, Lithuania

 orcid.org/0000-0002-6151-3104


Lina Volodzkiene

Mykolas Romeris University, Lithuania

 orcid.org/0000-0002-0914-1905

Laura Dargenyte-Kacileviciene

Mykolas Romeris University, Lithuania

 orcid.org/0000-0002-8552-8829

The impact of organizational resilience on the quality of public services: Application of structural equation modeling

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Abstract

Research background: During the COVID-19 pandemic, public sector entities encountered extraordinary difficulties in maintaining the delivery of public services. They were ill-equipped to operate in the unpredictable circumstances of the pandemic, causing a significant impact on the accessibility and quality of public services. This scenario also highlighted the importance of the resilience of the public sector, which entails an organization's capacity to function in a crisis setting and uncover opportunities that might not have been evident during normal circumstances.

Purpose of the article: This study aims to assess development trends within public sector resilience and their impact on the quality of public services. As resilience is realized through a three-phase prism — i.e., Planning, Adaptation, and Enhanced Learning — we hypothesize that Adaptation is endogenously interrelated with Planning and positively affects Enhanced Learning, which in turn positively impacts Service Quality.

Methods: Two successive surveys were carried out to examine the links between organizational resilience and Service Quality in the public sector. The first involved interviewing 401 senior managers of the organizations that provide public services in Lithuania to assess their level of organizational resilience. The second survey involved questioning individuals aged 18 and above who had used the services of the previously surveyed organizations. In total, 3,609 public service users were interviewed to gather data on Service Quality. Structural equation modeling was performed to analyze the data collected.

Findings & value added: The results of structural equation modeling revealed that Enhanced Learning positively and significantly affects Service Quality. The findings of this study suggest that the bounce-back stage of organizational resilience, i.e., Adaptation, indirectly affects Service Quality through the bounce-forward stage, i.e., Enhanced Learning. Thus, Enhanced Learning acts both as an accelerator of Service Quality and as a moderator of the effect that other stages of organizational resilience have on Service Quality. The primary contribution of this article is its discovery that Service Quality develops from Enhanced Learning, implying that the optimal approach to service provision is based on both newly acquired knowledge and experience gained during challenging times. This enables organizations to transform their service delivery in response to the realities of changing circumstances, thereby creating opportunities to prepare for future challenges from the standpoint of a new equilibrium.

Introduction

Due to ongoing adversities such as COVID-19, geopolitical instability, and energy crises, public sector organizations must manage setbacks and ensure the delivery of uninterrupted and high-quality public services to those who count on them, i.e., citizens. In retrospect, it is undeniable that public sector organizations faced unprecedented challenges in ensuring the provision of public services during the COVID-19 pandemic. Most were not

prepared to function in the turbulent conditions of the pandemic, which significantly affected the availability and quality of public services (Butkus *et al.*, 2023). Due to nationwide lockdowns, public sector organizations needed to plan other ways in which they would maintain service delivery. The Report on Public Employment and Management (OECD, 2021) revealed that, notwithstanding the complicated circumstances, the public sector organizations that had mastered flexible structures before the pandemic tended to fear less and demonstrated more resilient responses concerning public service provision. They could quickly reorient from a normal state to a crisis mode, implement digital tools, and master remote work methods, thus ensuring the continuity of public service delivery (MacLean & Titah, 2022). This context has highlighted the phenomenon of resilience in the public sector, which explains an organization's capacity to function in a crisis environment and delves into opportunities that it would not have been possible to observe in a non-crisis state.

In a broad sense, resilience is understood as the ability of a state, system, organization, community, or individual to adapt, return to normal activities aftershocks or threats, and use the experience acquired as a driving force for breakthroughs (Plimmer *et al.*, 2022). However, it is noteworthy that public sector organizations generally realize resilience as a form of recovery rather than transformation, which is more related to bounce-back momentum — i.e., an organization's ability to recover to a pre-crisis state of equilibrium (Ticlau *et al.*, 2021; Aragao & Fontana, 2022; Elston & Bel, 2023; Leite & Hodgkinson, 2021; Reichenbach *et al.*, 2021; Fehrer & Bove, 2022). A separate scientific stream contends that a resilient public sector should demonstrate the capacity to meticulously prepare contingencies, restore operations to a pre-crisis state, and use the crisis as a window of opportunity to bounce forward by taking organizations to the next level and using the knowledge and experience gained through the setback to prepare for future adversity (Clement *et al.*, 2015; Rajala & Jalonen, 2023; Vigoda-Gadot *et al.*, 2022; Herrero & Kraemer, 2022; Hoegl & Hartmann, 2021; Mithani *et al.*, 2021).

An extensive body of literature shows that the phenomenon of developing resilience in public sector organizations is still an emerging field dominated by qualitative research (Aragao & Fontana, 2022; Kirsop-Taylor, 2022; Rochet *et al.*, 2008; Termeer & van den Brink, 2013; Lund & Andersen, 2022; Ticlau *et al.*, 2021; Shaw, 2012). Meanwhile, only some empirical studies have delved into assessing resilience in public sector organizations (El-

ston & Bel, 2023; Bright, 2021; Van Loon, 2016; Plimmer *et al.*, 2022; Fischer *et al.*, 2023). Only a small number of studies that address the context of public sector resilience and its interrelations with the quality of public service provision can be identified. Indeed, the interconnections between public sector resilience and Service Quality are often studied within the framework of specific sectors or fields, such as transportation (Ebrahimi & Bridgelall, 2021; Chang *et al.*, 2020), energy transition (Roemer & Haggerty, 2022), or outsourcing (Aragao & Fontana, 2022).

Most of these studies are theoretical. As a result, a gap remains to be filled in terms of empirical evidence that could enhance our comprehension of patterns in the development of resilience in the public sector and their correlation with the quality of public services.

In addition, this study also explores whether the impact of resilience on Service Quality differs in organizations of different sizes. Brykman and King (2021) argued that larger organizations are more resilient and can better absorb shock than smaller ones. Larger organizations usually have more considerable resources at their disposal, which is crucial in times of crisis as it allows them to ensure the optimal redistribution of funds. To extend this further, this study explores the influence of the demographic characteristics, i.e., education and gender, of senior management on resilience and their impact on the quality of services. This is based on the Upper Echelons Theory, which states that organizational outcomes are affected by managerial background characteristics (Gu, 2023). Moreover, COVID-19 pandemic has emphasized the gender gap in public leadership and decision-making roles. This was evident in the insufficient representation of women in the temporary decision-making groups established by countries to tackle the pandemic. However, other empirical evidence revealed that women leaders played a critical role in enhancing the resilience of their family businesses during the pandemic. Despite declining sales and revenue, they accomplished this by concentrating on safeguarding businesses and their stakeholders (Anggadwita *et al.*, 2022).

This study also delves into another demographic aspect: how the education levels of managers affect organizational resilience and, in turn, the quality of service. Kallias *et al.* (2023) revealed that the education level of senior management becomes vital when dealing with larger, more complex organizations. Managers with higher education levels usually have broader knowledge and skills, enabling them to understand complex business challenges and reinforce forward-thinking solutions. Hence, they may also be

better equipped to analyze data and make informed decisions (Gu, 2023). In contrast to this approach, most studies analyze information on the education level of managers for descriptive analysis (Slaymaker *et al.*, 2022) or spotlighting informal education and learning patterns.

Thus, considering the presented arguments and limitations, this study offers a novel perspective by examining the influence of organizational resilience on the quality of public sector services. Moreover, this study incorporates demographic factors and explores whether they are essential in building organizational resilience and affecting Service Quality.

The paper is structured as follows: firstly, we present an analysis of scientific literature and the hypotheses formed on its basis; secondly, we develop the methodology, which incorporates two key components – survey method and structural equation modeling; the third part presents the results of empirical research conducted in the organizations that provide public services in Lithuania; the fourth section reveals the results and initiates the discussion; finally, the fifth part concludes the paper by presenting the conclusion, limitations, and further directions.

Literature review and hypothesis development

As discourse on the phenomenon of resilience becomes active, a prominent role is given to the conceptual interpretation of the framework of organizational resilience and the determination of its impact on the quality of public sector services. During the COVID-19 pandemic, the quality and availability of services offered by the public sector experienced difficulties, and some services in fact became unavailable, which caused significant anxiety and dissatisfaction among citizens. Existing service delivery models needed to be revised to respond to citizens' needs (Chui, 2022), thus challenging the public sector to devise and adopt innovative ways to ensure business continuity.

Most services have been transformed to exist in the digital space – e.g., medical, educational, legal, and other services are now provided remotely (MacLean & Titah, 2022; Ziakis & Kydros, 2022). Undoubtedly, this ambiguous transformation required enormous effort and forced public sector organizations to adapt to the new context and meet the expectation that access to public services would continue despite the complexity of the COVID-19 crisis (Šperka & Halaška, 2017). However, this caused signifi-

cant turbulence among employees at the work-unit level and led to a lack of role clarity, a significant stressor for employees (Verlinden *et al.*, 2022). Given this, it is worth exploring why high change complexity, where multiple diverse types of change occur, accumulates high stress and causes low role clarity. In light of the phenomenon of organizational resilience, the ability to deal with high change complexity could be explained by adequate planning to meet adversity (Mazzucato & Kattel, 2020; Termeer & van den Brink, 2013). Undoubtedly, this is not easy, as it deals with planning for something that may not occur soon. These phenomena are also known as black swan events, i.e., potential turbulences that we do not yet know exist (Adobor *et al.*, 2021). By planning and testing crisis management plans (Waithaka *et al.*, 2020), encouraging resilient leadership (Ticlau *et al.*, 2021; Näswall *et al.*, 2019; Arsawan *et al.*, 2022) and employee sense-making (Termeer & van den Brink, 2013), as well as investing in effective knowledge dissemination channels and formal learning mechanisms (Orth & Schuldis, 2021), organizations will naturally strengthen their capability to ensure quality of services to citizens in the face of uncertainty.

Better planning cannot prevent uncertainties and setbacks. As such, organizations are called to develop capacity that will provide them with the ability to cope with and absorb shocks when they take place, thus enriching their internal ability to more rapidly recover to a pre-crisis state. Public sector organizations that invest the time to prepare for uncertainty before adversity demonstrate comparably lower signs of decline during crises, faster recovery, and smoother adaptation. This notion is supported by Elston and Bel (2023), who explored the benefit of inter-municipal collaboration during COVID-19 lockdown and its impact on the provision of Housing Benefit services in England. Their results revealed that larger organizations tend to be more resilient and absorb shocks better than smaller ones. Larger organizations usually have a more considerable amount of capital at their disposal, which is crucial in times of crisis as it allows them to ensure the optimal redistribution of funds (Brykman & King, 2021). Thus, collaboration and shared services are being brought to light to cope with a lack of resources during setbacks, which unequivocally requires planning far in advance of adversity (Du *et al.*, 2022; Węgrzyn, 2018).

Analyzing the notion of recovery and adaptation, it becomes evident that it is equated to organizations' efforts to replicate pre-crisis activities, i.e., bounce back, which fails to appreciate the opportunities that arise during a crisis. On the contrary, extensive literature (Plimmer *et al.*, 2022;

Hoegl & Hartmann, 2021) stresses the importance of learning from the setback, i.e., the momentum of bouncing forward, which is explained as the organization's ability to learn from the past and ensure that those lessons are carried through to the future (Philipsen *et al.*, 2021; Fehrer & Bove, 2022; Lund & Andersen, 2022). As adversities reveal the areas in which capacities are crucial in the public sector (Mazzucato & Kattel, 2020), it is up to organizations to identify those areas and proceed with unlearning first (Orth & Schuldis, 2021) — i.e., to update existing knowledge with new ideas based on the experience gained during the crisis. However, it is necessary to address the notion that learning momentum develops self-sufficiently in robust organizations that demonstrate a high capacity to plan and adapt to changed environments (Phillips *et al.*, 2023; Duit, 2016; Shaw, 2012). Hence, planning and adaptation, also seen as the bounce-back model, become essential prerequisites to successful learning, i.e., bouncing forward (Bartuseviciene *et al.*, 2023).

These observations become meaningful in exploring the paths of the assessment of the impact of resilience on Service Quality, and provide a basis for forming these assumptions. First, we suggest delving into organizational resilience through the prism of three stages: Planning, Adaptation, and Enhanced Learning. Second, we argue that an approach towards service provision after a setback based on new knowledge and experience enables organizations to transform services considering the realities of the changed circumstances, thus creating the conditions to plan for future adversities from the standpoint of a new equilibrium (Brykman & King, 2021; Phillips *et al.*, 2023). These arguments lead to the assumption that the quality of services should evolve from the learning phase and not adaptation, as the latter is associated with providing the service in the same manner as it was provided before the crisis, thus preventing the development of the provided services considering the changed conditions (Darkow, 2019). Thus, based on the previous research and theoretical assumptions, we hypothesize that:

H1: *Adaptation is endogenously interrelated with Planning and positively affects Enhanced Learning which, in turn, positively impacts Service Quality.*

This hypothesis highlights the significance of fostering resilience in public service organizations, subsequently influencing Service Quality. Investigating this assumption will enhance our understanding of resilience devel-

opment patterns in the public sector. This holds great importance, as disruptions often expose areas of weakness. Regardless of the scale or severity of the disruption, organizations providing public services are responsible for ensuring timely, accessible, and good-quality public services. However, there needs to be a more theoretical and empirical understanding of resilience patterns in public organizations. These organizations face constraints such as budget limitations, hierarchical structures, and limited talent and motivation for change. Empirical evidence linking resilience development and Service Quality is crucial for further investigation, leading to more comprehensive resilience measurement methods that address the unique challenges of public organizations.

Methods

Measurement instruments

To explore the relationship between organizational resilience and Service Quality in the public sector, we used a measurement instrument which is related to two validated questionnaires: a short version of the Resilience Benchmark Tool (RBT-13) developed by Whitman *et al.* (2013) and later validated by Gonçalves *et al.* (2019); and questionnaire adapted from that of Mardaras *et al.* (2021) (see Table 1).

Although Gonçalves *et al.* (2019) used an 8-point Likert scale and Whitman *et al.* (2013) used a 4-point Likert scale, we use a 7-point Likert scale, with 7 representing strong agreement and 1 representing strong disagreement.

A Servqual model of the ten initially conceptualized Service Quality dimensions (see Table 2) was used to create a measurement instrument for Service Quality. Within the Servqual framework, the questionnaire was structured and formulated so that each statement, which is positively worded, reflected one of the ten Service Quality dimensions. Here we also used a 7-point Likert scale.

We used Cronbach's alpha to measure the reliability of the items on a scale.

Sampling

Two consecutive surveys were conducted to collect the data necessary to analyze the link between organizational resilience and Service Quality in the public sector. To measure organizational resilience, senior managers of organizations that provide public services were interviewed from March to April 2022. From May to September 2022, we collected data on the quality of public services by interviewing users of the services of the previously surveyed organizations aged 18 years and above.

Since there is no register of organizations providing public services in Lithuania, and thus the population size was unknown, we calculated the sample size assuming that the population was infinite. With a confidence level of 95% and a margin of error equal to 5%, the minimum required sample size was 385.

The unknown size and characteristics of the population challenged us to ensure a representative sample. We assumed that the spatial (regional) distribution of organizations providing public services in Lithuania should follow the spatial (regional) distribution of the population, with a slight bias towards the capital region, Vilnius, and the second largest region, Kaunas, due to the disproportionately higher concentration of health care, higher education, and other organizations in these areas. Quotas of organizations in each NUTS 3-level region were assigned according to Lithuania's regional population distribution (data for 2021) plus 10% and 5% for the Vilnius and Kaunas regions, respectively (see sample distribution by counties in Table 3). Thus, the overall number of organizations for which the data was collected was 401. To represent various types of public services, we purposefully tried to reach organizations that would represent all service categories based on "The Methodology for Estimating the Public Services User Satisfaction Index" prepared by the Ministry of Internal Affairs of the Republic of Lithuania (see sample distribution by type of services in Table 3).

The interviews of public service users were organized at the organizations' facilities after service provision. We collected data from 3,609 users of public services in the previously interviewed organizations. Our sample characteristics and their comparison with the population's characteristics are reported in Table 4.

The distribution of the sample according to different sociodemographic characteristics (gender, age, education, marital or employment status, etc.)

corresponds well with the characteristics of the whole population (see Table 4). There is no possibility to compare the sample with the population in terms of income level, since this statistic is not provided for the population.

Models and estimation strategy

To test our hypothesis (H1) regarding the structure of organizational resilience and its effect on Service Quality in the public sector — i.e., that Adaptation is endogenously interrelated with Planning and positively affects Enhanced Learning, which in turn positively impacts Service Quality — we performed structural equation modeling (SEM) using Model presented in Figure 1.

The latent variables — Planning, Adaptation, Enhanced Learning, and Service Quality — are formed by the observed variables (items) P_1_SA, ..., P_6_PM, A_1_RS, ..., A_9_SR, EL_1_LL, ..., EL_10_EA, and SQ_1_RELI, ..., SQ_10_TANG. Data on these variables was collected using the questionnaires.

The selection of the SEM estimator depends on whether the data distribution is normal. Since our sample contains over 300 data points, K-S and S-W tests could be inaccurate for testing whether the data is normality distributed. For that purpose, we used Skewness and Kurtosis as follows: if Skewness and Kurtosis fall into the ranges of $(-2; 2)$ and $(-7; 7)$, respectively, then the distribution is normal (see Table).

The descriptive statistics presented in Table 6 (where Skewness and Kurtosis fall into the range $(-2; 2)$ and $(-7; 7)$, respectively) allow us to consider that all of the items are normally distributed, and we can use a maximum likelihood estimator to perform SEM. The goodness-of-fit of the model is measured using several indices (see Table 6). At least two fit indices should support the model's goodness of fit.

Results

After collecting the data, we tested the reliability of our items on a scale using Cronbach's alpha. The results are presented in Table 7. Looking at the values of Cronbach's alpha, we can state that the internal consistency of the items within the dimensions of organizational resilience is good, and the overall internal consistency of our items in the organizational resilience

questionnaire is excellent. The same is true considering items in the Service Quality questionnaire.

Goodness-of-fit statistics (see Table 8) indicate a very good fit of estimated Model using SEM, CMIN/DF is below 3, CFI and TLI are above 0.9, and RMSEA is below 0.07.

The estimated coefficients (see Table 9) are in line with our hypothetical structure of organizational resilience. The covariance between dimensions of Planning and Adaptation is positive and statistically significant when analyzing both the whole sample and subsamples, which implies a positive endogenous relationship. In analyzing standardized regression weights, we can conclude that Adaptation positively and significantly affects Enhanced Learning. This conclusion is true considering both the whole sample and smaller subsamples. Separate observable items adequately describe the latent dimensions of organizational resilience. All standardized regression weights are positive and above 0.4 considering the whole sample. Analyzing subsamples, coefficients are lower and, in some cases, insignificant, but remain positive.

Discussion

This study aimed to explore the relationships between dimensions of resilience and Service Quality. SEM revealed that Enhanced Learning positively and significantly affects Service Quality. These findings suggest that the bounce-back stage of organizational resilience, i.e., Adaptation, indirectly affects Service Quality through the bounce-forward stage, i.e., Enhanced Learning. Thus, Enhanced Learning acts both as an accelerator of Service Quality and as a moderator of the effect that other stages of organizational resilience have on Service Quality. These results are promising, as extensive literature (Brykman & King, 2021; Van Loon, 2016; Phillips *et al.*, 2023) shows that organizational transformation and growth happen from learning. Moreover, they also relate to unlearning, the purpose of which is to abandon normal routine activities to make room for new experiences and knowledge gained during a crisis (Orth & Schuldis, 2021). In addition, during the learning phase, organizations can restructure themselves (Rochet *et al.*, 2008) and acquire new competencies (Darkow, 2019) that would enable them to provide quality public services in light of changed circumstances and respond to the new needs of service users. These findings also reveal

the organization's ability to act with foresight, as learning is directly associated with the ability to recognize future threats (Rajala & Jalonen, 2023; Mazzucato & Kattel, 2020).

Nevertheless, the significant effect of Enhanced Learning on Service Quality is evident if we conclude the results of the estimation for the whole sample. These results are heterogeneous across groups of organizations. Analyzing further, it is clear that the effect of Enhanced Learning on Service Quality is only significant in the group of organizations with males as senior managers. The estimated standardized regression weight of the effect of Enhanced Learning on Service Quality is 1.5 times larger in organizations with a male senior manager compared to the weight across the whole sample. Although this result is fairly clear, we found no similar studies supporting the effect of resilience on Service Quality from a gender perspective. Comparing effects in groups of organizations based on the educational attainment level of senior managers, we found a significant effect of Enhanced Learning on Service Quality when the senior manager has a master's degree. The obtained results allow us to assume that managers with higher education degrees have a deeper understanding and more knowledge regarding managing their organizations — both in the face of uncertainty and afterwards. According to Plimmer *et al.* (2022), managers with higher learning orientations can cope and adapt to new conditions faster. Moreover, they are more likely to perceive adversity as an opportunity; thus, they demonstrate a better capacity to bounce forward. Unfortunately, we failed to estimate the effects of senior managers that hold doctoral degrees, since this subsample ($N = 25$) was smaller than the number of parameters we had to estimate.

Grouping organizations by size, we found a significant effect of Enhanced Learning on Service Quality in the largest organizations. Indeed, larger organizations should be better positioned to provide more resilient services as they are less susceptible to fluctuations in processing times and ability. In addition, larger organizations usually have a more considerable amount of capital at their disposal, which is crucial as it allows them to ensure the optimal redistribution of funds (Brykman & King, 2021). Increasing smaller organizations' resilience and their ability to provide better quality services during setbacks requires intensifying collaboration practices amongst the different-sized public sector entities responsible for public service provision (Elston & Bel, 2023). By working together, organizations could reallocate resources based on demands at any time.

In summary, these results reveal the crucial role of resilience in ensuring the provision of public services, leading to significant practical implications. Firstly, this provides empirical evidence that fostering resilience is worthwhile as it positively affects Service Quality. Secondly, implementing resilience and Service Quality measurement tools as self-assessment instruments can enable managers to monitor resilience levels over time. Lastly, these findings emphasize the importance of continuous learning as a core strategy at all levels of the organization, as it enables organizational transformation and growth through the recognition of future threats.

Conclusions

This study takes a novel approach by focusing on the impact of organizational resilience in the public sector on the quality of services provided, and derives some critical insights. First, extensive literature shows that organizational resilience is vital in delivering uninterrupted, high-quality service to citizens. These insights are of paramount importance to the public sector and organizations that provide public services, as one of the primary responsibilities of these organizations is ensuring that the provision of public services meets expectations. Second, we suggested exploring the resilience of public sector organizations based on three stages: Planning — organizational behavior before adversity; Adaptation — bouncing back to the pre-crisis state; and Enhanced Learning — the ability of the organization to bounce forward or transform based on the knowledge and experience acquired during the setback. Third, we hypothesized that Adaptation is endogenously interrelated with Planning and positively affects Enhanced Learning which, in turn, positively impacts Service Quality. Scientific arguments support the notion that the bounce-back stage of organizational resilience, i.e., Planning and Adaptation, serves as an imperative prerequisite for the successful bounce-forward stage of organizational resilience, i.e., Enhanced Learning.

The empirical findings revealed that Enhanced Learning positively and significantly affects Service Quality. Meanwhile, Adaptation indirectly affects Service Quality through Enhanced Learning. These results suggest that Enhanced Learning is both an accelerator of Service Quality and a moderator of the effect that other stages of organizational resilience have on Service Quality. It is important to note that the significant effect of En-

hanced Learning on Service Quality is observed if the results of estimation for the whole sample are included, which are heterogeneous across groups of organizations. Estimated coefficients related to the structure of organizational resilience are relatively stable if we compare groups of organizations formed based on different aspects. However, this is not the case considering the effect of Enhanced Learning. We have found strong evidence that organizational resilience helps to improve Service Quality in large organizations, when the senior manager is male, and when they hold a diploma higher than a bachelor's. In small organizations or organizations with senior managers with relatively low educational attainment levels, the effect of organization resilience on Service Quality is not evident. These findings pose questions for future research, such as those investigating the significance of the senior manager's demographic characteristics on organizational resilience and Service Quality.

The primary added value and scientific novelty of this article lie in its finding that Service Quality evolves from Enhanced Learning, meaning that the approach towards service provision is based on new knowledge and experience collected during adversity. This enables organizations to transform service provision considering the realities of changed circumstances, thus creating the conditions to plan for future adversities from the standpoint of a new equilibrium.

Finally, it is necessary to point out the limitations of this study. Although the theoretical model to assess the impact of organizational resilience on Service Quality was determined based on the newest scientific findings presented by various scholars, the empirical evidence for this research was formed from data collected in one country: Lithuania. Irrespective of the fact that adequate statistical representation was fully respected, the applicability of our findings could be limited. Nevertheless, this limitation sets out another future direction to be tackled: the expansion of the sample, including various regions.

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Annex

Table 1. Dimensions and corresponding items in the organizational resilience measurement instrument

Dimension	Item	Abbrev.
	Statement	
Planning	Our management thinks and acts strategically to ensure that we are always ahead of the curve.	P_1_SA
	There would be good leadership within our organization if a crisis struck.	P_2_GL
	Our priorities for recovery would provide direction for staff in a crisis.	P_3_PR
	Our organization practices and tests emergency plans regularly.	P_4_EP
	We build relationships with other organizations that we might have to work with during a crisis.	P_5_BR
	We proactively monitor our environment to have an early warning of emerging issues.	P_6_PM
Adaptation	Our organization can shift rapidly from business-as-usual to responding to crises.	A_1_RS
	In a crisis, we seek opportunities for our organization.	A_2_SO
	People in our organization “own” a problem until it is resolved.	A_3_OP
	Our organization’s culture is to be very supportive of staff.	A_4_SC
	Our organization can make tough decisions quickly.	A_5_QD
	Staff are rewarded for “thinking outside the box.”	A_6_OB
	Staff have the information and knowledge that they need to respond to unexpected problems.	A_7_IK
	There is a sense of teamwork and camaraderie in our organization.	A_8_TW
	Our organization maintains sufficient resources to absorb unexpected changes.	A_9_SR
Enhanced Learning	We learn lessons from the past and ensure those lessons are carried through to the future.	EL_1_L L
	Talent is empowered and managed.	EL_2_T E
	There are formal organizational knowledge management tools supported by senior management.	EL_3_K M
	Our teams freely make their own short-term plans.	EL_4_FP
	Our teams learn from their mistakes and are not penalized for them.	EL_5_L M
	Team members must be able to adapt their capabilities to the environment’s needs.	EL_6_A C
	Our organization allows the team to react quickly and freely to opportunities.	EL_7_R Q
	We believe that the best results in innovation come from intuition and team improvisation.	EL_8_II
	Gender equality is important in our organization.	EL_9_G E
	We use crises as an opportunity to enhance our organization’s activity	EL_10_E A

Source: adapted from Whitman *et al.* (2013), Gonçalves *et al.* (2019), Mardaras *et al.* (2021)

Table 2. Ten Service Quality dimensions and the corresponding items of the Servqual model in the Service Quality measurement instrument

Dimension	Item	Abbrev.
	Statement	
Reliability	The institution provides the service following the promised deadlines, and the employees inform regarding when the service will be provided and are responsible for it.	SQ_1_RELI
Responsiveness	When you applied for services, your problem/need was responded to promptly, and the waiting time for the service was not too long.	SQ_2_RESP
Competence	The specialists providing the services were competent, and your problem/request was professionally solved.	SQ_3_COMP
Access	It is easy to find all the necessary specialists at the service-providing institution during working hours, the institution is located in an easily accessible place, and the working hours are convenient for you.	SQ_4_ACCE
Courtesy	Specialists providing services are pleasant when communicating with customers, and the institution sincerely cares when providing information/solving a problem/request.	SQ_5_COUR
Communication	The information provided by the institution is easy to get, detailed and understandable, and employees always have time to answer customers' questions.	SQ_6_COMM
Credibility	The institution providing the service has a good reputation/I trust it.	SQ_7_CRED
Security	The price of the provided service is acceptable/suitable/correct, and the behavior of the employees allows customers not to be afraid of the result, i.e., successful service provision.	SQ_8_SECU
Understanding	The institution serves customers individually, showing them attention, taking an interest in the customer's interests, and understanding the special/specific/individual needs of the customers.	SQ_9_UNDE
Tangibles	The premises of the institution providing the services are clean and tidy; they have all the tools and equipment necessary to provide the service, and the professionals providing the services wear appropriate clothes.	SQ_10_TANG

Source: adapted from Parasuraman *et al.* (1985).

Table 3. Sample of organizations providing public services

	No. of observations
Total	401
By county	
Telsiai	18
Panevezys	30
Siauliai	37
Taurage	13

Table 4. Continued

	No. of observations
Vilnius	120
Utena	18
Klaipėda	46
Alytus	19
Kaunas	81
Marijampole	19
By type of service provided	
Employment	24
Law enforcement	7
Real estate management	12
Public transport and communication	26
Tourism	33
Legal	5
Other	14
Culture and sports	45
Business	27
Health care	31
Utilities and environmental management	33
Education	55
Social	39
Fire protection and rescue	29
Taxes administration	21
By size of the organization (number of employees)	
Micro (less than 10)	61
Small (10–49)	124
Medium (50–250)	168
Large (more than 250)	48
By the gender of the organization's senior manager	
Male	208
Female	193
By educational degree of the organization's senior manager	
Bachelor's (undergraduate)	78
Master's (postgraduate)	294
Doctoral	25

Table 5. Sample characteristics of public service users

Characteristics		Distribution		No of observations
		In population	In sample	
Gender ⁽¹⁾	Male	45.55%	44.17%	1,594
	Female	54.45%	55.83%	2,015
Age ⁽¹⁾	18–24	8.26%	9.11%	329
	25–34	15.53%	15.82%	571
	35–44	16.22%	17.63%	636
	45–54	17.13%	18.11%	654
	55–64	18.61%	18.05%	651
	65–74	12.88%	12.34%	445
	75–84	8.24%	7.80%	282
	85 and above	3.13%	1.14%	41
Education ⁽²⁾	ISCED 0–2	12.62%	13.30%	480
	ISCED 3–4	50.95%	50.94%	1,838
	ISCED 5–8	36.43%	35.76%	1,291
Marital status ⁽¹⁾	Never married	25.94%	25.53%	921
	Married	50.58%	52.32%	1,888
	Divorced	14.04%	14.08%	508
	Widowed	9.44%	8.07%	291
Employment status ⁽¹⁾	Employed	59.74%	69.83%	2,520
	Unemployed	3.30%	9.84%	355
	Inactive	36.96%	20.34%	734
Counties (regions) ⁽¹⁾	Telsiai	4.64%	4.57%	165
	Panevezys	7.49%	7.92%	286
	Siauliai	9.24%	6.51%	235
	Taurage	3.21%	2.69%	97
	Vilnius	29.44%	31.28%	1,129
	Utena	4.44%	4.66%	168
	Klaipėda	11.65%	12.52%	452
	Alytus	4.80%	5.24%	189
	Kaunas	20.28%	20.23%	730
Marijampole	4.81%	4.38%	158	
Family size ⁽³⁾	1 person	28.30%	26.68%	963
	2 persons	25.90%	24.17%	872
	3 persons	18.60%	20.05%	724
	4 persons	18.10%	19.53%	705
	5 and more persons	9.10%	9.57%	345
Monthly income per family member, €	Up to 500	-	20.14%	727
	500–700	-	23.83%	860
	701–900	-	21.09%	761
	901–1200	-	18.29%	660
	1201 and above	-	16.65%	601
Type of services provided	Employment	-	5.93%	214
	Law enforcement	-	2.05%	74
	Real estate management	-	3.85%	139
	Public transport and communication	-	6.68%	241
	Tourism	-	8.23%	297
	Legal	-	1.03%	37
	Other	-	2.91%	105
	Culture and sports	-	10.67%	385

Table 6. Sample characteristics of public service users

Characteristics	Distribution		No of observations
	In population	In sample	
Business	-	6.43%	232
Health care	-	7.76%	280
Utilities and environmental management	-	8.06%	291
Education	-	14.10%	509
Social	-	10.17%	367
Fire protection and rescue	-	6.70%	242
Taxes administration	-	5.43%	196

Notes:

⁽¹⁾ 2022 statistics⁽²⁾ 2021 statistics⁽³⁾ 2019 statistics**Table 7.** Descriptive statistics of the items

Dimension	Item abbrev.	Average	95% C.I.	Std. dev.	Skewness	Kurtosis
Planning	P_1_SA	6.02	(5.92; 6.12)	1.03	-1.46	3.39
	P_2_GL	6.20	(6.12; 6.28)	0.77	-0.95	1.79
	P_3_PR	5.91	(5.81; 6.01)	1.04	-1.19	2.00
	P_4_EP	5.16	(5.00; 5.31)	1.59	-0.82	-0.02
	P_5_BR	5.66	(5.54; 5.77)	1.21	-1.30	2.25
	P_6_PM	5.96	(5.86; 6.06)	0.99	-1.18	1.81
Adaptation	A_1_RS	6.05	(5.96; 6.14)	0.92	-1.21	2.26
	A_2_SO	6.20	(6.11; 6.29)	0.89	-1.73	5.15
	A_3_OP	6.23	(6.15; 6.30)	0.80	-1.08	2.16
	A_4_SC	6.22	(6.14; 6.31)	0.87	-1.57	4.54
	A_5_QD	6.02	(5.93; 6.11)	0.88	-1.00	2.38
	A_6_OB	5.90	(5.81; 5.99)	0.92	-0.96	1.36
	A_7_IK	5.76	(5.67; 5.85)	0.90	-0.72	1.65
	A_8_TW	6.04	(5.96; 6.13)	0.85	-0.58	-0.08
	A_9_SR	4.76	(4.63; 4.90)	1.40	-0.48	-0.34
Enhanced Learning	EL_1_LL	6.14	(6.06; 6.23)	0.83	-0.82	0.46
	EL_2_TE	6.16	(6.07; 6.25)	0.90	-1.33	2.81
	EL_3_KM	5.36	(5.22; 5.50)	1.44	-0.99	0.61
	EL_4_FP	5.96	(5.85; 6.06)	1.04	-1.30	2.04
	EL_5_LM	5.98	(5.88; 6.08)	1.01	-1.37	2.98

Table 8. Continued

Dimension	Item abbrev.	Average	95% C.I.	Std. dev.	Skewness	Kurtosis
	EL_6_AC	6.24	(6.17; 6.32)	0.73	-0.69	0.06
	EL_7_RQ	6.10	(6.02; 6.18)	0.82	-0.90	0.98
	EL_8_II	6.20	(6.11; 6.28)	0.87	-1.02	0.71
	EL_9_GE	6.42	(6.33; 6.51)	0.91	-1.93	4.51
	EL_10_EA	6.21	(6.12; 6.29)	0.85	-1.12	1.39
Reliability	SQ_1_RELI	5.68	(5.61; 5.76)	0.73	-0.69	0.53
Responsiveness	SQ_2_RESP	5.61	(5.54; 5.68)	0.71	-0.47	-0.02
Competence	SQ_3_COMP	5.78	(5.71; 5.85)	0.74	-0.77	0.33
Access	SQ_4_ACCE	5.65	(5.58; 5.73)	0.77	-0.76	0.50
Courtesy	SQ_5_COUR	5.81	(5.74; 5.89)	0.74	-0.66	0.24
Communication	SQ_6_COMM	5.63	(5.55; 5.70)	0.72	-0.55	0.09
Credibility	SQ_7_CRED	5.78	(5.71; 5.85)	0.73	-0.57	-0.04
Security	SQ_8_SECU	5.48	(5.41; 5.55)	0.72	-0.53	0.62
Understanding	SQ_9_UNDE	5.76	(5.69; 5.83)	0.69	-0.67	0.32
Tangibles	SQ_10_TANG	6.16	(6.09; 6.22)	0.64	-1.22	1.47
Adaptation	A_1_RS	6.05	(5.96; 6.14)	0.92	-1.21	2.26
	A_2_SO	6.20	(6.11; 6.29)	0.89	-1.73	5.15
	A_3_OP	6.23	(6.15; 6.30)	0.80	-1.08	2.16
	A_4_SC	6.22	(6.14; 6.31)	0.87	-1.57	4.54
	A_5_QD	6.02	(5.93; 6.11)	0.88	-1.00	2.38
	A_6_OB	5.90	(5.81; 5.99)	0.92	-0.96	1.36
	A_7_IK	5.76	(5.67; 5.85)	0.90	-0.72	1.65
	A_8_TW	6.04	(5.96; 6.13)	0.85	-0.58	-0.08
	A_9_SR	4.76	(4.63; 4.90)	1.40	-0.48	-0.34
Enhanced Learning	EL_1_LL	6.14	(6.06; 6.23)	0.83	-0.82	0.46
	EL_2_TE	6.16	(6.07; 6.25)	0.90	-1.33	2.81
	EL_3_KM	5.36	(5.22; 5.50)	1.44	-0.99	0.61
	EL_4_FP	5.96	(5.85; 6.06)	1.04	-1.30	2.04
	EL_5_LM	5.98	(5.88; 6.08)	1.01	-1.37	2.98
	EL_6_AC	6.24	(6.17; 6.32)	0.73	-0.69	0.06
	EL_7_RQ	6.10	(6.02; 6.18)	0.82	-0.90	0.98
	EL_8_II	6.20	(6.11; 6.28)	0.87	-1.02	0.71

Table 9. Continued

Dimension	Item abbrev.	Average	95% C.I.	Std. dev.	Skewness	Kurtosis
	EL_9_GE	6.42	(6.33; 6.51)	0.91	-1.93	4.51
	EL_10_EA	6.21	(6.12; 6.29)	0.85	-1.12	1.39
Reliability	SQ_1_RELI	5.68	(5.61; 5.76)	0.73	-0.69	0.53
Responsiveness	SQ_2_RESP	5.61	(5.54; 5.68)	0.71	-0.47	-0.02
Competence	SQ_3_COMP	5.78	(5.71; 5.85)	0.74	-0.77	0.33
Access	SQ_4_ACCE	5.65	(5.58; 5.73)	0.77	-0.76	0.50
Courtesy	SQ_5_COUR	5.81	(5.74; 5.89)	0.74	-0.66	0.24
Communication	SQ_6_COMM	5.63	(5.55; 5.70)	0.72	-0.55	0.09
Credibility	SQ_7_CRED	5.78	(5.71; 5.85)	0.73	-0.57	-0.04
Security	SQ_8_SECU	5.48	(5.41; 5.55)	0.72	-0.53	0.62
Understanding	SQ_9_UNDE	5.76	(5.69; 5.83)	0.69	-0.67	0.32
Tangibles	SQ_10_TANG	6.16	(6.09; 6.22)	0.64	-1.22	1.47

Table 10. Goodness-of-fit statistic

Indices	Abbrev.	Threshold value
The ratio between chi-squared (χ^2) and degree of freedom (df)	CMIN/DF	<3.0
Comparative fit index	CFI	>0.9
Tucker–Lewis index	TLI	>0.9
Root mean square error of approximation	RMSEA	<0.08

Table 11. Cronbach's alpha

Group of items	Number of items	Cronbach's alpha
Planning	6	0.853
Adaptation	9	0.854
Enhanced Learning	10	0.884
Total	25	0.940
Service Quality	10	0.968

Table 12. Model goodness-of-fit statistics

Statistics	Value
CMIN/DF	2.460
CFI	0.919
TLI	0.909
RMSEA	0.060

Table 13. Maximum likelihood estimates of covariances and regression weights

	Whole sample	Head manager's characteristics							
		Gender				Education			
		Male	Female	Bachelor's	Master's	Micro	Small	Medium	Large
Covariance									
Planning↔Adaptation	0.367***	0.423***	0.316***	0.349***	0.350***	0.488**	0.313***	0.366***	0.233***
Standardized Regression weights									
Enhanced Learning ↔Adaptation	0.904***	0.911***	0.892***	0.935***	0.904***	0.871***	0.898***	0.925***	0.915***
Service Quality↔Enhanced Learning	0.106**	0.153**	0.044	-0.040	0.166***	0.111	0.086	0.048	0.324**
P_1_SA↔Planning	0.730***	0.729***	0.736***	0.602***	0.751***	0.851***	0.621***	0.738***	0.851***
P_2_GL↔Planning	0.687***	0.723***	0.653***	0.562***	0.702***	0.791***	0.566***	0.742***	0.663***
P_3_PR↔Planning	0.736***	0.713***	0.768***	0.752***	0.754***	0.862***	0.713***	0.722***	0.693***
P_4_EP↔Planning	0.705***	0.776***	0.623***	0.596***	0.745***	0.582***	0.696***	0.757***	0.592***
P_5_BR↔Planning	0.715***	0.735***	0.686***	0.634***	0.739***	0.679***	0.705***	0.710***	0.650***
P_6_PM↔Planning	0.750***	0.741***	0.756***	0.706***	0.777***	0.807***	0.686***	0.767***	0.657***
A_1_RS↔Adaptation	0.637***	0.642***	0.633***	0.551***	0.644***	0.592***	0.557***	0.741***	0.488***
A_2_SO↔Adaptation	0.623***	0.576***	0.683***	0.714***	0.573***	0.697***	0.619***	0.621***	0.471***
A_3_OP↔Adaptation	0.635***	0.650***	0.630***	0.536***	0.651***	0.731***	0.458***	0.719***	0.757***
A_4_SC↔Adaptation	0.727***	0.715***	0.744***	0.804***	0.703***	0.770***	0.742***	0.680***	0.848***
A_5_QD↔Adaptation	0.752***	0.739***	0.768***	0.787***	0.731***	0.871***	0.744***	0.712***	0.699***
A_6_OB↔Adaptation	0.708***	0.726***	0.677***	0.831***	0.671***	0.743***	0.738***	0.648***	0.730***
A_7_IK↔Adaptation	0.756***	0.790***	0.718***	0.781***	0.753***	0.690***	0.800***	0.746***	0.802***
A_8_TW↔Adaptation	0.659***	0.699***	0.609***	0.600***	0.665***	0.737***	0.558***	0.661***	0.802***
A_9_SR↔Adaptation	0.403***	0.380***	0.461***	0.240**	0.465***	0.367***	0.440***	0.410***	0.255
EL_1_LL↔Enhanced Learning	0.724***	0.784***	0.641***	0.569***	0.756***	0.726***	0.679***	0.770***	0.638***
EL_2_TE↔Enhanced Learning	0.747***	0.721***	0.775***	0.767***	0.742***	0.825***	0.788***	0.628***	0.863***
EL_3_KM↔Enhanced Learning	0.546***	0.655***	0.421***	0.475***	0.558***	0.257*	0.610***	0.640***	0.545***

Table 14. Continued

	Whole sample	Head manager's characteristics							
		Gender		Education		Organization size			
		Male	Female	Bachelor's	Master's	Micro	Small	Medium	Large
EL_4_FP←Enhanced Learning	0.619***	0.653***	0.580***	0.553***	0.627***	0.573***	0.599***	0.650***	0.615***
EL_5_LM←Enhanced Learning	0.720***	0.674***	0.779***	0.693***	0.719***	0.791***	0.711***	0.707***	0.691***
EL_6_AC←Enhanced Learning	0.709***	0.728***	0.671***	0.566***	0.747***	0.629***	0.637***	0.776***	0.799***
EL_7_RQ←Enhanced Learning	0.817***	0.828***	0.793***	0.827***	0.810***	0.835***	0.808***	0.825***	0.787***
EL_8_II←Enhanced Learning	0.665***	0.663***	0.664***	0.429***	0.719***	0.657***	0.630***	0.676***	0.719***
EL_9_GE←Enhanced Learning	0.533***	0.541***	0.535***	0.553***	0.529***	0.635***	0.513***	0.540***	0.474***
EL_10_EA←Enhanced Learning	0.739***	0.710***	0.784***	0.819***	0.719***	0.730***	0.730***	0.795***	0.618***
SQ_1_RELI←Service Quality	0.897***	0.904***	0.887***	0.902***	0.903***	0.882***	0.874***	0.917***	0.894***
SQ_2_RESP←Service Quality	0.919***	0.920***	0.920***	0.878***	0.940***	0.921***	0.907***	0.925***	0.923***
SQ_3_COMP←Service Quality	0.938***	0.937***	0.938***	0.938***	0.941***	0.947***	0.924***	0.950***	0.934***
SQ_4_ACCE←Service Quality	0.906***	0.919***	0.893***	0.834***	0.924***	0.895***	0.866***	0.930***	0.925***
SQ_5_COUR←Service Quality	0.934***	0.920***	0.947***	0.892***	0.940***	0.953***	0.924***	0.940***	0.925***
SQ_6_COMM←Service Quality	0.919***	0.911***	0.928***	0.890***	0.922***	0.904***	0.924***	0.922***	0.907***
SQ_7_CRED←Service Quality	0.918***	0.928***	0.909***	0.880***	0.922***	0.908***	0.922***	0.916***	0.938***
SQ_8_SECU←Service Quality	0.793***	0.764***	0.827***	0.735***	0.802***	0.849***	0.797***	0.786***	0.751***
SQ_9_UNDE←Service Quality	0.803***	0.794***	0.816***	0.842***	0.785***	0.848***	0.834***	0.786***	0.772***
SQ_10_TANG←Service Quality	0.626***	0.604***	0.650***	0.520***	0.626***	0.599***	0.722***	0.602***	0.585***
Number of observations	401	208	193	78	294	61	124	168	48

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 1. Structural equation modeling (Model)

