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RESEARCH ARTICLE – BUSINESS MANAGEMENT

Effect of Organization Agility and Service Quality on Organization Performance Through IT Infrastructure Flexibility

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Abstract

In this study, the effects of organization speed, service quality, and the flexibility of IT infrastructure on the success of a group of public and private universities and colleges in Diyala city were studied. The current study has a practical goal and is a detailed poll when it comes to gathering data. A questionnaire was used to get the information. It was put together by looking at books and doing research in the area. The statistical group that was looked at was made up of 384 workers and clients of Diyala University in Iraq. Using Cochran's sample size method, 384 people were chosen as a statistical sample. The method for picking people was random stratification. In this study, organization speed and service quality were looked at as independent factors, organization success as a dependent variable, and IT infrastructure flexibility as an intermediate variable. Cronbach's alpha was used to measure the truth of both form and content and to figure out how reliable something was. When structural equation modelling was used in the Lisrel software system, the results showed that the speed and service quality of the organization has a good effect on the success of the organization, with the flexibility of the IT infrastructure playing a mediating role.

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Keywords: Organization agility, service quality, organization performance, IT infrastructure flexibility

1. Introduction

To keep up with the ever-changing demands of the market and the constant threats posed by competitors, businesses need the capacity to adapt quickly and make necessary modifications [1, 2]. To improve its performance [3, 4], the company requires a flexible IT infrastructure that allows for rapid response and the development of high-quality services.
Following are some of the gaps that this study aimed to fill. While it is true that agile organizations and high-quality services help them maintain a competitive edge, research on the correlation between this concept and the adaptability of IT infrastructure has been scant [5, 6]. Second, the impact of service quality on agility in organizations has been underappreciated in the literature [7, 8].

Statement of the problem: In favourable circumstances, the company's lightness and the quality of its services can be generated. Information technology infrastructure is the basis on which the characteristics of organizational response capacity and service quality can rest. Looking at the relationship between organizational agility, quality of service and its positive effects on performance, it is clear that these two factors must be considered strategic assets, organizational responsiveness and service quality. The company's success may suffer if the service's lightness and quality are penetrated.

The importance of this study comes by filling in some gaps in the literature by proposing a structural equation model to analyze the relationship between organizational agility and service quality as they relate to the adaptability of IT infrastructure and the performance of Diyala Universities in Iraq. Moreover, this paper collects new regulations and procedures along with reviewing the current administrative operations to increase the lightness of the regulatory movement and increase the university's performance. This paper may help in increasing the quality of educational services.
First, there has been a meteoric rise in the number of students who might eventually become the sector's central pillar. In light of this, it became clear how much power there was in fostering organizational agility, which could be used to create institutions that could adapt quickly to a variety of challenges. Second, Diyala Universities needed agility, service quality, and IT infrastructure to improve their performance [9] since

their internal driver was weak in a sluggish business environment. Section 2 of the article covers the background reading and hypothesis formation, the methodology, the results, and the conclusion.
This paper provides the theoretical and practical case studies applied at Diyala Universities. In other words, there are practical consequences for this study and academy. To start, it sheds light on the interaction between the lightness of the regulatory movement, the quality of service, and the main resources. Search results act as a reminder for C-SUITE executives that the infrastructure of information technology is not only a valuable platform. This study provided decision-makers with a useful tool for making prioritized choices by using an importance-performance matrix analysis, which measures how each construct affects a target construct.

2. Theoretical background

2.1. Organizational Agility (OA)

Agility in business is described as "the capacity to recognize and rapidly respond to opportunities and threats in the marketplace" [10]. According to the systems theory, (1) everything in the universe is made up of other things, (2) those objects have attributes, and (3) those properties are always represented by values. To broaden the scope of systems theory, it was claimed that "some system properties may be properties of their components but with new values" and that "other system properties are new in the sense that no individual component possesses them in isolation." The latter are known as emergent characteristics of the system. Both the individual parts and their connections to one another define the worth of emergent features. Relationships between individuals and between cultures are examples of fundamental aspects that the agility paradigm touches on. As a result, enough organizational agility necessitates a company-wide culture of change. Continuous innovation is more likely to occur in organizations with high levels of organizational agility [11]. To meet the needs of their customers and take advantage of new opportunities in the market, agile businesses can move swiftly [12].
H1. Organizational Agility (OA) has a significant positive effect on IT infrastructure flexibility (IIF) among public and private universities

2.2. Service Quality (SQ)

One definition of service quality (SERVQUAL) is "the extent to which customers' expectations about a service are met by the service they receive" [13]. Longitudinal assessments of customers' perceived opinions on services, staff participation, dedication to the end products and services, strategic effort to acquire a competitive advantage, and the value of the creation are what many studies mean when they talk about service quality [14,15,13, 16]. Priyo et al. [17] define SERVQUAL as “the management of the quality required to meet the expectations of customers.” It’s a group of advantages enjoyed by consumers as a result of a heightened focus on service terms, product quality, and customer status that makes it easier to make purchases. The CARTER model and the SERVQUAL model have both seen extensive application in the context of service quality assessment [18, 15]. In [19, 20], Parasuraman et al. introduced and refined the SERVQUAL model. However, the CARTER model was created by Othman and Owen [21]. Several aspects of service quality measurement are where the SERVQUAL and CARTER models diverge. In contrast to the CARTER model’s definition of just five dimensions, which is in full conformity with the SERVQUAL model, the SERVQUAL model employs five dimensions: tangibles, empathy, assurance, dependability, and responsiveness. Customer happiness and service quality in Sweden were measured using the SERVQUAL methodology by Fornell [22]. A company’s service quality may be described via the lens of the SERVQUAL model’s five criteria. Tangibles, empathy, assurance, dependability, and responsiveness have all been proven to have substantial effects on consumer loyalty in the past. All the things you can touch and see, such as the bank’s furnishings, fixtures, and equipment, as well as the cleanliness, personal appearance, and general atmosphere [23, 21]. Empathy is the ability to understand a client’s perspective and respond to their needs with compassion and the highest quality of service. The employee’s capacity to instil confidence and trust in their customers is shown by their assurance [21]. Clients may always rely on your services when they are reliable. To be responsive is to be able to and willing to provide assistance and services to consumers based on their specific requirements [24, 25].
H2. Service Quality (SQ) has a significant positive effect on IT infrastructure flexibility (IIF) among the public and private universities

2.3. IT infrastructure flexibility (IIF)

An organization’s IT infrastructure is the interconnected system of computers, networks, and other technology that allows it to conduct its day-to-day operations and develop new products and services [26]. An IT infrastructure may include any combination of platform technology (including hardware and operating systems), network and communications technology, and data and data management systems (Duncan, 1995). The elasticity of a company’s IT setup is quantified by the IIF [25]. According to [24], an IIF is an information technology framework that allows for the creation, testing, and rollout of a wide variety of business applications and the dissemination of data to any part of an organization or the outside world. The four tenets of IIF are “connectivity,” “compatibility,” “modularity,” and “IT people expertise” [26, 27].
H3. IT infrastructure flexibility (IIF) has a significant positive effect on organizational performance (OP) among public and private universities

2.4. Organizational Performance (OP):

Despite the various terms used to describe it, most studies treat the performance of businesses and other organizations as a composite of financial and non-financial indicators. For instance, [28] evaluated businesses using two metrics: financial and market success. Market performance and operational performance are two distinct dimensions that have been used to assess a company’s success in the past [29, 30]. According to the literature, operational performance relates to a company’s productivity (such as profits and return on investment) [31, 32], whereas market performance reflects the real results of a commercial organization (such as market share and new markets).
H4. IT infrastructure flexibility (IIF) mediates the association between Organizational Agility (OA) and *Service Quality (SQ)* on the Organizational Performance (OP) of the public and private universities.

3. Research methodology

The quantitative data for this research were gathered via a cross-sectional survey of accredited institutions in Diyala, Iraq. This study's population comprised public and private university students and staff. The statistical population of the research is the employees and students of the private university of Diyala in Iraq, whose number is unknown, and according to Cochran's formula, with an error rate of 5%, it is considered 384 people. Figure 1 below shows the suggested relationship between the determinants of the research.

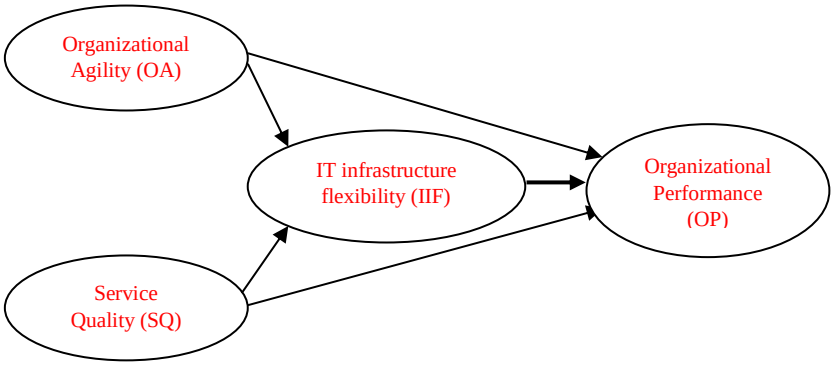

Fig. 1. Outer model loadings and cross-loadings. Retrieved Yasir, M., et al. (2021) & Chen, X. F., & Siau, K. (2020)

4. Research instruments

This study involved universities in Diyala province: a public university named Diyala University, two private colleges named "Elyrmouk" and "Messian", 15 technical colleges and two teacher training institutes.
The questionnaire was adapted from those of previous research with some necessary tweaks. For both private and public schools in Diyala, OA explains the structure and dynamics of the many internal and external connections that make up the institution. The five-item OA measurement tool was adapted from research by [32].
With the knowledge obtained via SQ, a university is better equipped to raise its service quality and seize market possibilities. Six items from the study by [34] were utilized for this study with slight alterations to meet the scope of this research.
Instant Approval and Feedback (IIF) is creating immediate engagement with present and prospective students and workers via sharing images, videos, teasers, etc. Three items from the research by [35] were taken with slight adjustments to meet the scope of this study to gauge the adaptability of IT infrastructure.
For both public and private schools in Diyala, OP details the structure and dynamics of the many internal and external interactions that make up the institution. Nine items were used from **[**33**]** 's research on assessing organizational performance, with some alterations made to match the scope of this study.

5. Data analysis methods

Because this study was exploratory, a PLS estimate was used to explain as much of the variation in the dependent constructs of the structural equation model as possible. Following the suggestions in [36] for PLS models, the results of this study are given as follows:

- Indicator reliability (Loadings of 0.70 on standardized indicators are common; 0.40 is acceptable for experimental research);
- Composite reliability (CR) and Cronbach's alpha (both values should be more than 0.70) to assess internal consistency dependability;
- - Convergent validity is assessed by checking if the average variance extracted (AVE) is equal to or greater than 0.50. - Discriminant validity is evaluated by examining cross-loadings.
- Effect size, or f 2, (0.02 for weak, 0.15 for intermediate, and 0.35 for strong); and estimates of the path coefficient.

6. Questionnaire analysis and results

6.1. Demographic characteristics

79% of the respondents are male and 21% are female. On the other hand, 3.5% of the respondents have an associate's degree and lower, 59% have a bachelor's degree, 37% have a master's degree, and 0.5% have a doctoral degree. Of the total respondents, 5% are between 20 to 30 years old, 86% are 36 to 50 years old, and 9% are 51 and above years old; in terms of experience, 5% of the respondents are less than ten years, 65% are between 10-20 years, 31% are between 21-30 years, and 0.5% are more than 30 years.

6.2. Reliability and validity analysis

The criteria for determining the trustworthiness of this research are listed in Table 1. Cronbach's alpha, composite reliability, and the average variance extracted (AVE) are all examples of such measures.
All indicators exhibit Cronbach's alpha values above 0.7, which indicates their high level of dependability. All indicators are considered credible because their Dillon-Goldstein's rho values exceed 0.7. An item can be considered dependable if its composite dependability score is greater than 0.7. Table 1 demonstrates that all AVE values for the constructs exceeded 0.50, indicating satisfactory convergent validity. This meets the required threshold for statistical significance. In this research, the variance inflation factors (VIF) were examined, and it was found that all values were less than 3.3. This indicates that multi-collinearity was not a significant concern [37]**.**

An indicator was considered to have high discriminant validity if more than 0.7 was loaded onto its outside components. In addition, the sum of a structure's cross-loadings should be less than the loading. It is OK to load components at a value of 0.5 if the AVE is more than that. Discriminant validity is shown by the fact that all indicator loadings in Table 2 are more than 0.7 and also exceed the total of the cross-loadings. Discriminant validity at the conceptual level is evaluated using the Fornell and Larcker criteria. Its failure to identify a lack of discriminant validity is shown by the Fornell-Larcker criterion in Table 2. The method of producing de-attenuated concept scores is also comparable to that of computing the heterotrait-monotrait ratio (HTMT), a metric for gauging the degree to which two constructs correlate. This study concludes that all constructs meet the criteria mentioned above, and there is no evidence of a loss of discriminant validity at the 0.9 level.

Table 1 Reliability and validity

Variables	**Items**	**Mean**	**SD**	**CA**	**DG rho**	**CR**	**AVE**	**VIF**
Organization agility	5	3.131	1.121	0.811	0.861	0.848	0.851	1.218
Service quality	6	3.742	0.868	0.790	0.895	0.893	0.675	1.191
Organization performance	9	3.602	0.880	0.735	0.990	0.822	0.872	1.001
IT infrastructure flexibility	5	3.247	0.845	0.721	0.827	0.981	0.811	-

Notes: SD stands for "standard deviation"; CA stands for "Cronbach's alpha"; DG rho stands for "Dillon-Goldstein's rho"; CR stands for "composite reliability"; AVE stands for "average variance extracted"; VIF stands for "variance inflation factors."

Table 2 Outer model loadings and cross-loadings

Items/variables	**OA**	**SQ**	**OP**	**IIF**	**Manufacturing SMEs 141**
OA – Item 1	0.862	1.121			
OA – Item 2	0.931	0.868			
OA – Item 3	0.774	0.880			
OA – Item 4	0.745	0.845			
OA – Item 5		0.819			
SQ – Item 1		0.787			
SQ – Item 2		0.742			
SQ – Item 3		0.724			
SQ – Item 4		0.865			
SQ – Item 5		0.943			
SQ – Item 6			0.867		
OP – Item 1			0.925		
OP – Item 2			0.736		
OP – Item 3			0.871		
OP – Item 4			0.869		
OP – Item 5			0.873		
OP – Item 6			0.735		
OP – Item 7			0.834		
OP – Item 8			0.967		
OP – Item 9				0.866	
IIF – Item 1				0.912	
IIF – Item 2				0.747	
IIF – Item 3				0.763	
IIF – Item 4				0.971	
Fonell – Larcher crilerion					
Organization agility	0.914				
Service quality	0.722	0.811			
Organization performance	0.566	0.627	0.844		
IT infrastructure flexibility	0.451	0.561	0.648	0.916	
Heterotrait – Monotrait Ratio (HTMT)					
Organization agility	-				
Service quality	0.473	-			
Organization performance	0.555	0.485	-		
IT infrastructure flexibility	0.410	0.385	0.347	-	

Notes: OA = Organization agility; SQ = service quality; OP = Organization Performance; IIF = IT infrastructure flexibility;
Source: Author's data analysis

6.3. Structural model

Positive path coefficients between organizational agility and IT infrastructure flexibility are statistically significant at the chosen significance level of 5%. This means that a college's organizational flexibility greatly and favourably contributes to the adaptability of its IT infrastructure using the development and use of databases that facilitate the effective administration of resources. The positive path coefficients between service quality and IT infrastructure flexibility are also statistically significant at the 5% significance level. This exemplifies how the agility of their IT infrastructure considerably aids in raising customer satisfaction with the services they get. In conclusion, the positive and statistically significant (at the 5% level) path coefficients between an adaptive IT infrastructure and an organization's success. This study indicates that having a flexible and reliable IT infrastructure has a significant and positive effect on business success. There was a wide variety of effect sizes (f 2) for the variables influencing IT infrastructure flexibility and IT infrastructure flexibility's influence on organizational performance across Diyala-Iraqi institutions. This study's findings indicate a positive and statistically significant (p 0.05) effect of organizational agility on organizational performance, with the moderating function of IT infrastructure adaptability. Figure 1 and Table 3 show that the partially mediating effect of IT infrastructure accounts for the positive and considerable (p 0.05) indirect impacts of service quality on organizational performance at public and private universities and colleges in Diyala.

Table 3 Reliability and validity

Associations	**Beta**	**t value**	**Significance**	**CI-Min**	**CI-Max**	f^2	**Decision**
OA → IIF	0.709	11.74	0.000	0.304	0.523	0.216	Accepted
SQ → IIF	0.764	10.96	0.000	0.209	0.376	0.115	Accepted
IIF → OP	0.987	15.52	0.000	0.217	0.402	0.116	Accepted
The mediating effect of ADVE							
OA → IIF → OP	0.513	8.237	0.000	0.089	0.167	Partial	
SQ → IIF → OP	0.541	9.463	0.000	0.064	0.126	mediation	
						Partial	
						mediation	

6.4. Importance- Performance matrix analysis

Table 4 shows that the most important factor in determining IT infrastructure flexibility at public and private institutions in Diyala was Organization agility (0.709), followed by Service Quality (0.764). Diyala University's organizational performance is best explained by the adaptability of its IT infrastructure (0.987%), followed by the quality of its services (0.764%), and finally, its agility (0.709%). The best performance (72.29 points) is found in the area of IT infrastructure network flexibility, followed by service quality (70.14) and Organization agility (69.71 points).

Table 4. Performance and total effects (Source: Author's data analysis)

Target construct Variables	**Consumer engagement**		**Performance**	
	Total effect	Performance	Total effect	Performance
Organization agility	0.709	69.91	0.513	69.71
Service quality	0.764	71.91	0.541	70.14
IT infrastructure flexibility	-	-	0.587	72.29

7. Conclusion

7.1 Practical Implications

There are practical consequences of this study as well as academic ones. It sheds light on the interplay between organizational agility and service quality, two key resources. Under favourable circumstances, a company's agility and the quality of its services may generate value. IT infrastructure is the foundation upon which organizational responsiveness and service quality qualities may rest. According to the results of this research, companies that want to maximize their organizational agility should prioritize the development of a versatile IT infrastructure. Given the correlation between organizational agility and service quality and their positive effects on performance, it's clear that these two factors should be considered strategic assets. A company's success may suffer if its agility and service quality are compromised. The research results serve as a reminder to C-suite executives that IT infrastructure is not only a valuable platform that helps enable internal and external communication and the present and future applications of the organization but also a strategic component that can contribute to the organization's performance. To fully use IT to improve organizational performance, executives are recommended to pay attention to a variety of aspects of IT infrastructure, such as IT infrastructure flexibility.

- Compilation of new regulations and procedures and a revision of the existing administrative processes to increase the university's organizational agility and performance.
- Compilation of different criteria for the academic evaluation of students
- Compilation of training programs and building capacity in university employees
- Compilation of updating programs for university professors
- Applying hardware and software systems to form appropriate databases and use them to produce the necessary information to measure performance and increase organizational agility in the university.
- Increasing the quality of educational services by making education more practical and accompanying the industry

7.2 Limitations of this Study and Future Research

In the current study, only cross-sectional data was used, while the use of cross-sectional data cannot properly show the effect of agility and service quality on the performance of public and private universities. The considered relationships between the variables in the present study have been examined only in the city of Diyala, Iraq, making it difficult to generalize the results to other cities.
The connection between business intelligence and the success of an organization is an important topic for future study. Quantifying the elements influencing university success using qualitative techniques. It is important to study how consumer agility, operational agility, and organizational performance are affected by knowledge transmission and application.

Nomenclature	**Items**
IT	Infrastructure
OA	Organization agility
IIF	IT infrastructure flexibility
SQ	Service Quality
OP	Organizational performance
CR	Composite reliability
AVE	
VIF	Average variance extracted
HTML	
	Variance inflation factors
	Heterotrait-monotrait

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