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How can Self-Development Improve the Relationship between Human Error and Service Effectiveness in the Public Sector?

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Abstract

This study examines the role of self-development as a mediating variable for the relationship between human error and service effectiveness in the public sector. Lately, the public service sector has become a particular concern because the public feels it is still inadequate and meets expectations. This research was conducted at the trade office of South Sumatra Province, INDONESIA. The survey was conducted on 150 respondents who were taken at random simply. Data analysis techniques are carried out with a structural equation model (SEM) approach. The results showed that Human error negatively affected the effectiveness of services at the Southern Sumatra Regional Trade Office. The existence of employee self-development has weakened the relationship between Human Error and service effectiveness. Through self-development on employee personal factors, work experience, and taking advantage of opportunities in the environment can reduce the role of human error on service effectiveness. Management should provide support and recognition to employees who seek to develop themselves and improve the quality of service. This can motivate employees to continuously improve their performance and contribute positively to the organization's effectiveness. More skilled and confident employees tend to have a better ability to overcome or compensate for mistakes. Self-development can be crucial in building an organizational culture more open to learning and improvement. Employees encouraged to continue developing themselves tend to be more open to receiving constructive feedback and learning from their mistakes and those of others. This can create an environment where mistakes are seen as opportunities to grow and improve, not as signs of failure.

Keywords
Human error, service effectiveness, self-development

1. Introduction

Effective public service in the administration of a government is the key to success through public satisfaction and trust. Community satisfaction is the main focus in providing quality public services (Jensen & Bro, 2018; Torfing, 2019). Good public services can create public trust and satisfaction in accessing public services, thus creating a good relationship between the community and public service providers (Arundel et al., 2019; Torfing et al., 2019). Quality public services can also increase the credibility of the organization in the eyes of the public (Koliba et al., 2018). Organizations that provide good public services will be considered more professional and trusted so that people will

feel more comfortable and have high confidence in organizational performance (Agostino et al., 2021; Arundel et al., 2019; Yang, 2018). Good quality public services can also be the basis for organizations' decision-making in planning and managing public policies (Agostino et al., 2021; Schott & Ritz, 2018).

Service effectiveness is the ability to provide services that meet the goals of society and the organization simultaneously. Service effectiveness includes the ability to meet community needs promptly, provide solutions to community problems, and provide services that are following community expectations (Demir et al., 2021; Rita et al., 2019). Effective service can provide a positive image for the organization in the eyes of the community and the wider community (Pham et al., 2019; Solimun & Fernandes, 2018). This can increase the trust and reputation of the organization. This is because effective services can help organizations identify community needs and provide appropriate and effective solutions. The effectiveness of good public services is very important to increase community satisfaction and improve organizational performance (Berman et al., 2021; Osborne, 2018; Rasul & Rogger, 2018).

The development of technology and information has affected the way organizations provide services to society (Filgueiras et al., 2019; Jehan & Alahakoon, 2020; Mittal, 2020). Organizations can now use various tools and systems to speed up and facilitate service. Such as using online platforms and mobile applications to make it easier for people to make transactions or access information about the services provided (Larsson & Teigland, 2019; Leão & Canedo, 2018; Lindgren & Veenstra, 2018). In addition, the development of social media also has an impact on the way organizations provide services. Society now pays more attention to values such as sustainability and corporate social responsibility, so organizations must be able to tailor community services to match those values, (Sergi & Sari, 2021; Tangi et al., 2021). Digital literacy is needed for bureaucratic leaders to understand the technology used in decision-making, communication, and data management processes.

A lack of understanding of digital literacy can lead to human error in using digital devices and applications, such as data input errors, operational errors, or errors in making decisions based on incorrect or incomplete data. Human error can occur in various situations and contexts, both in daily life, work, and within the scope of the organization (Simpson & Horberry, 2018). Human error can have a major influence on service effectiveness. Human error can cause various kinds of problems in service, such as delays, defects in the products or services provided, and even accidents that threaten the safety of customers and employees (Paramanantham & Liyanage, 2023; Velmurugan et al., 2022). Non-compliance with established procedures or policies can also hurt service effectiveness. This can result in a decrease in the quality of the products or services provided and affect customer confidence in the company or organization concerned (Orhan et al., 2022; Velmurugan et al., 2022). In addition, human errors can also affect employee productivity and increase operational costs, especially if the errors require additional time and resources to be corrected. Therefore, controlling the risk of human error and increasing employee awareness and skills in following established procedures and policies are very important to improving service effectiveness (Chicu et al., 2019; Moraru et al., 2020)

The Expectancy-Confirmation Model theory states that customer satisfaction depends on the extent to which people's expectations of service are met or even exceeded when they use an organization's products or services, (Oliver, 1980). This theory states that consumer satisfaction depends on the extent to which a given product or service meets previous expectations and experiences. So, the higher the match between expectations and previous experiences with reality, the more likely consumers will be satisfied. The purpose of this study is to develop a model of service effectiveness based on human error and employee self-development in public service.

2. Literature Review

The relationship between human error variables and service effectiveness has a significant impact in a variety of contexts. Human error, especially related to information processing, communication, or the performance of tasks, can reduce the quality of service, (Rasmussen, 1983). This kind of mistake can cause harm to customers and damage service effectiveness. In addition, human error also creates uncertainty and customer anxiety about service reliability. According to Simpson & Horberry (2018), Human error can also be an opportunity for improvement. Organizations can learn from such mistakes and implement necessary changes in processes, training, or supervision to prevent similar mistakes in the future. With education, training, good supervision, and the use of advanced technology, organizations can reduce the risk of human error that can interfere with service effectiveness, while stimulating improvement and innovation, (Orhan et al., 2022). Therefore, careful management of human error variables is an important step in an effort to improve service effectiveness, Chicu et al., 2019).

Self-development variables can play an important role in moderating the effect of human error on service effectiveness in an organizational context. When individuals actively develop themselves, they can gain better knowledge, skills, and awareness of the potential for human error and ways to avoid it, (Aboalshamat et al., 2015).. This includes training, supervision, increased discernment, stress management, and the ability to use past experiences as learning. In addition, self-development can also help bureaucratic leaders in understanding the needs and expectations of the community in the services provided, (Demir et al., 2021; Ojogiwa, 2021; Shimengah, 2018).

Self-development can also influence organizational culture by promoting identification, reporting, and learning from mistakes. Thus, individual self-development is an important factor in creating an environment that supports service effectiveness and reduces the negative impact of human error, (Maslow, 1970). Organizations that encourage and support individual self-development in this regard have a greater opportunity to improve the effectiveness of their services and provide more reliable services to customers.

3. Methods

The scope of this study is to examine how human error affects service effectiveness with self-development as a moderation variable. This study used a research design that is causality. This type of design aims to see the causal relationship between the variables studied, where one variable affects other variables, in this case the author analyzes the effect of human error on service effectiveness with self-development as a moderation variable.

Data analysis conducted to test this study was by *the Partial Least Square* (PLS) method. The PLS method was chosen based on previous research and it was considered that in this study there were two latent variables with *formative indicators.*The model used in this study is a model of causality or influence relationship. To test the hypothesis proposed in this study, the analytical technique used is SEM or *Structural Equation Modelling* which is operated through the SMART-PLS program (Gunarto, 2018).

4. Data Collection

Data collection techniques in research consist of two methods, namely the distribution of questionnaires directly and questionnaires through Google form links. The distribution of questionnaires is directly carried out to the State Civil Apparatus (ASN) within the South Sumatra Regional Trade Office, while the distribution through the Google Form Link questionnaire is carried out to ASNs who cannot be reached directly such as in Jambi, Bengkulu, Bangka Belitung Islands and Lampung. By using these two methods, researchers hope to obtain complete and representative data on various aspects that are the focus of research. In addition, the use of integrated data collection techniques such as this is also expected to optimize the quality and accuracy of the data obtained, so that the resulting research results can be more valid and scientifically accountable. The total population in this study is 425 civil servants in the South Sumatra Provincial Trade Office. The number of samples in this study was 200 respondents who were taken randomly simply. Research instruments are developed based on operational definitions in Table 1.

Table 1. Operational Research Variables

Variable	Dimension		Indicator	Item Questioner
Human Error **(HE)** errors or accidental actions committed by humans that can result in a negative impact on the performance of the system or organization, (Strauch, 2017)	HE01	Information processing errors	1. Data accuracy	1
			2. Understanding instructions	2
			3. Risk understanding	3
	HE02	Behavior and attitude	1. Carelessness	4
			2. Care for procedures	5
			3. Negligence in verification	6
	HE03	Stress and fatigue	1. Sleep disorders	7
			2. Emotional tension	8
			3. Decreased concentration	9

Variable	Dimension		Indicator	Item Questioner
	HE04	Working environment	1. Noise	10
			2. Visual disturbances	11
			3. Excessive wktu pressure	12
Self-Development Improve (SDI) An employee's efforts in meeting his needs for self-actualization (Robbins et al., 2021)	SDI01	Personal Factors	1. Interest	1
			2. Level-level,	2
			3. Talent, and	3
			4. Personality	4
	SDI02	Work experience	1. Technical skills	5
			2. interpersonal.	6,7
	SDI03	Environmental factors	1. Lingkungan sosial,	8
			2. budaya,	9
			3. organisasi	10
Service Effectiveness (SE) The ability of employees to produce a service output as expected (Mathis & Jackson, 2018)	SE01	Quality of service	1. Conformity of needs with customer expectations	1
			2. Reliability	2
			3. Security	3
	SE02	Customer satisfaction	1. Customer satisfaction level	4
			2. Customer loyalty level	5
			3. customer recommendation rate	6
	SE03	Service efficiency	1. Service Time	7
			2. service fee	8
			3. Resources used	9

Source: developed from various references, 2023

5. Results and Discussion

5.1. Characteristics of Respondents

The respondents participating in the study consisted of 200 respondents, classified by gender, age, and education. The majority of respondents were men as many as 130 people (65%). The age range of 31-40 years is 46 people (43%) with an average undergraduate education of 108 people (54%).

5.2. Measurement Model Analysis Results

The first step in structural model equation analysis (SEM) involves exploring the measurement model, also known as the outer model in the context of Partial Least Squares (PLS). This step is applied first because it can describe specifically the relationship between the latent variable and the observable variable respectively. One of the initial results obtained from this outer model is an assessment of construct validity and reliability.

Analysis of measurement models in this study uses the first-order construct (FOC) or low-order construct (LOC) method, which is a modeling method where constructs are reflected or formed by indicators. The results of the formation of the initial model on the measurement model are shown in Figure 1.

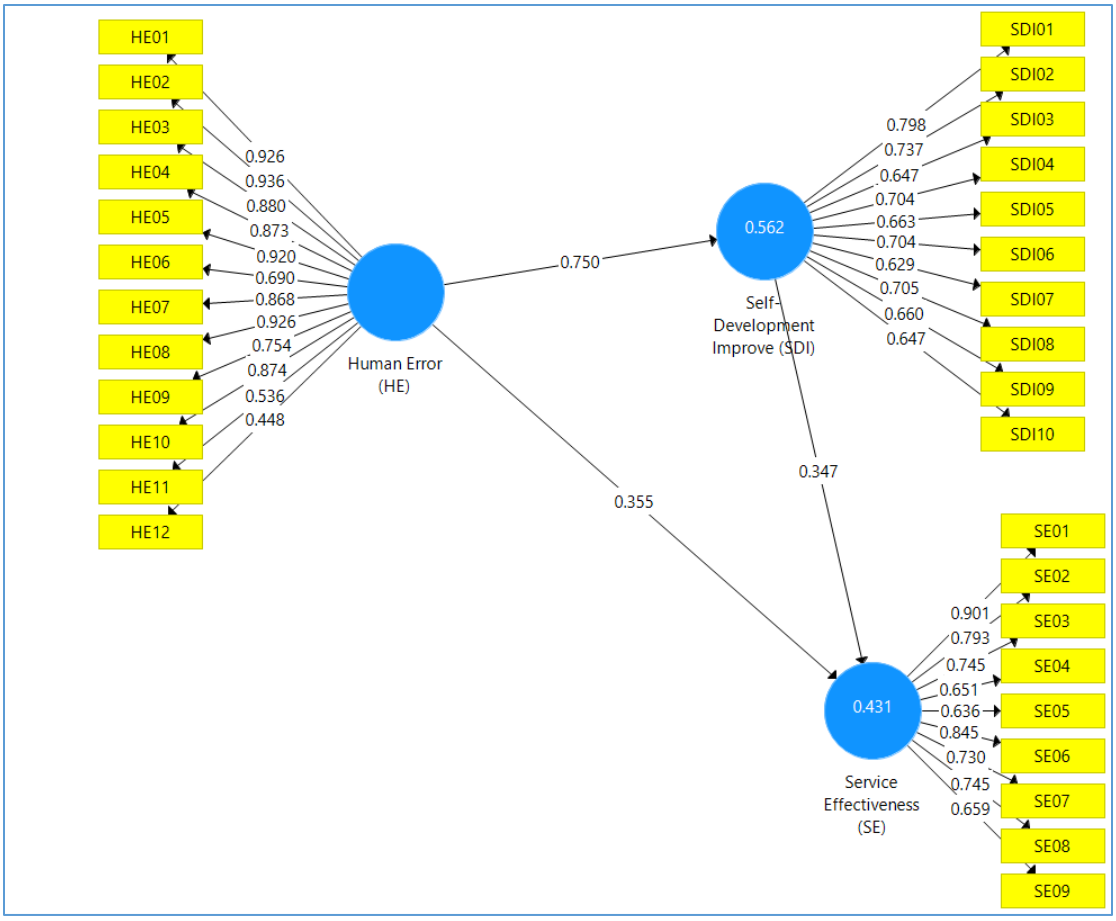

Figure 1. Initial Measurement Model

The initial measurement model in *lower order* describes manifest variables that correlate with the construct (*outer loading*) as shown in Table 2.

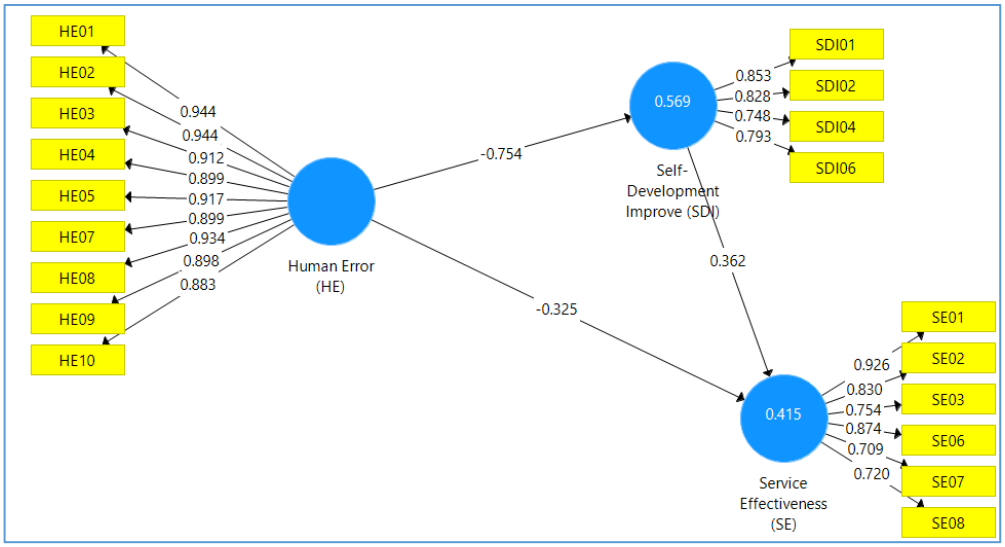

Figure 2. Measurement Model Revision

Table 2 Outer *Loading Values* of Initial Measurement Model

Indikator	Human Error (HE)	Self-Development Improve (SDI)	Service Effectiveness (SE)	Note
HE01	0.926			Valid
HE02	0.936			Valid
HE03	0.880			Valid
HE04	0.873			Valid
HE05	0.920			Valid
HE06	0.690			Not Valid
HE07	0.868			Valid
HE08	0.926			Valid
HE09	0.754			Valid
HE10	0.874			Valid
HE11	0.536			Not Valid
HE12	0.448			Not Valid
SDI01		0.798		Valid
SDI02		0.737		Valid
SDI03		0.647		Not Valid
SDI04		0.704		Valid
SDI05		0.663		Not Valid
SDI06		0.704		Valid
SDI07		0.629		Not Valid
SDI08		0.705		Valid
SDI09		0.660		Not Valid
SDI10		0.647		Not Valid
SE01			0.901	Valid
SE02			0.793	Valid
SE03			0.745	Valid
SE04			0.651	Not Valid
SE05			0.636	Not Valid
SE06			0.845	Valid
SE07			0.730	Valid
SE08			0.745	Valid
SE09			0.659	Not Valid

Based on Table 2 it can be seen that *the outer loading* on each variable still has an invalid indicator because the *outer loading value* <0.7. The revision of the Measurement Model is carried out through an iteration process by eliminating invalid indicators, and the final model is obtained as shown in Figure 2.

The revised measurement model in *lower order* describes manifest variables that correlate with constructs (*outer loading*) as in Table 3.

Table .3 Revision of Outer Loading Values

Indicator	Human Error (HE)	Self-Development Improve (SDI)	Service Effectiveness (SE)	Note
HE01	0.944			Valid
HE02	0.944			Valid
HE03	0.912			Valid
HE04	0.899			Valid
HE05	0.917			Valid
HE07	0.899			Valid
HE08	0.934			Valid
HE09	0.898			Valid
HE10	0.883			Valid
SDI01		0.853		Valid
SDI02		0.828		Valid
SDI04		0.748		Valid
SDI06		0.793		Valid
SE01			0.926	Valid
SE02			0.830	Valid
SE03			0.754	Valid
SE06			0.874	Valid
SE07			0.709	Valid
SE08			0.720	Valid

The results of the revision of the measurement model on each variable are able to produce validity and reliability parameter values that meet the *rule of thumb*. All *outer loading values* in the manifest variable to the construct, as well as the *outer loading* construct value are above 0.7, and produce reliable construct values. The AVE and CR values produced in each variable's construct are also above 0.7 for AVE and above 0.5 for CR, so it can be said that the convergent validity of all variables and their manifestations is fulfilled as shown in Table 4.

Table 4 Reliability Values

Variable	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)	Note
Human Error (HE)	0.968	0.972	0.973	0.800	Reliable
Self-Development Improve (SDI)	0.821	0.841	0.881	0.650	Reliable
Service Effectiveness (SE)	0.894	0.931	0.917	0.650	Reliable

Based on the outer *model measurement* on the revised latent variables, it can be concluded that all constructs of revised variables are valid and reliable.

5.3. Results of Structural Model Analysis

The structural model is carried out by *bootstrapping steps* on SmartPLS after the measurement model is declared valid and reliable. The result of the formation of the structural model is obtained as in Figure 3.

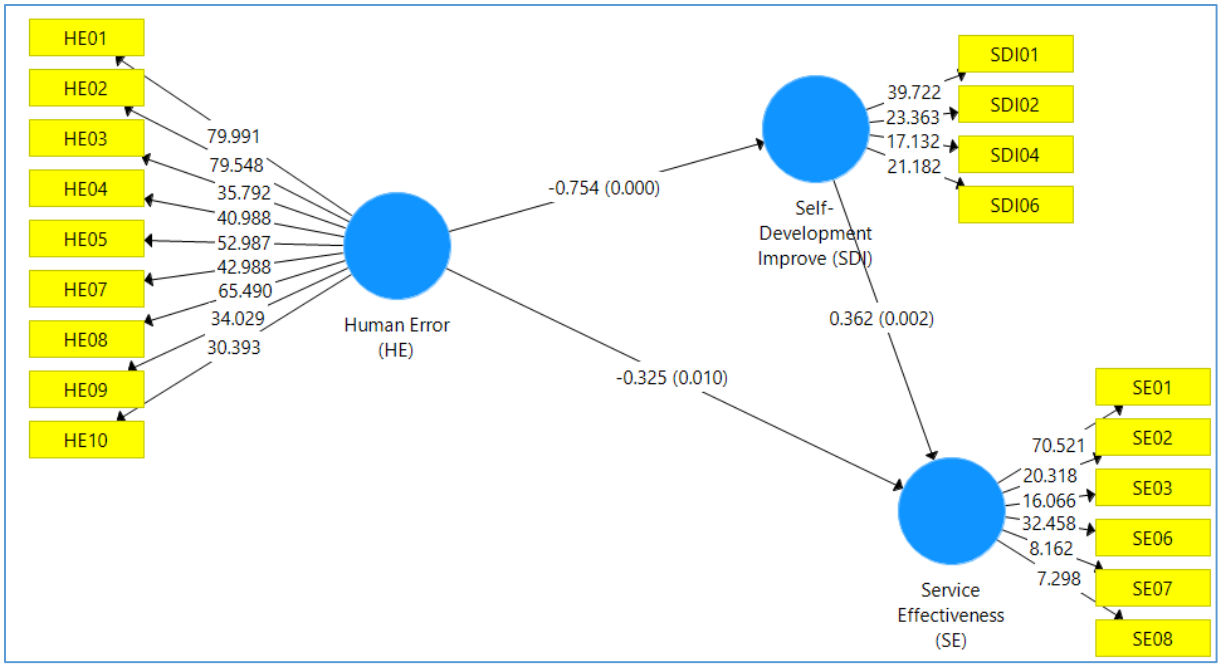

Figure 3. Structural Model

Figure 3 shows the relationship that occurs between exogenous and endogenous latent variables. The values displayed are the size of the path coefficients in each relationship which shows the magnitude of the direct influence of exogenous variables on endogenous variables. In the formation of this full model, the outer value of the model is indicated by the t-value. While the inner model is shown from the path coefficient value and p-value (in parentheses). In summary, the test results of the model are shown in Table 5.

Table 5. Nilai Path Coefficients, T-statistics, P-value

Direct Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Human Error (HE) -> Self-Development Improve (SDI)	-0.754	-0.753	0.041	18.325	0.000
Human Error (HE) -> Service Effectiveness (SE)	-0.325	-0.323	0.125	2.591	0.010
Self-Development Improve (SDI) -> Service Effectiveness (SE)	0.362	0.365	0.118	3.066	0.002
Indirect Relationships	**Original Sample (O)**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Human Error (HE) -> Service Effectiveness (SE) through Self-Development Improve (SDI)	-0.273	-0.277	0.096	2.840	0.005

Table 5 provides a fairly clear picture of the relationship between Human Error (HE), Self-Development Improve (SDI), and Service Effectiveness (SE). H1 shows the negative effect of Human error (HE) on Self-Development Improve (SDI), statistically significant because the value of p-p is less than 0.05. Human Error can be considered as

a major obstacle in the process of individual self-development. As human error increases, individuals' ability to improve themselves is significantly affected. This suggests that efforts to reduce human error can potentially increase the level of personal progress and development (Moraru et al., 2020; Paramanantham & Liyanage, 2023).

H2 shows the negative effect of Human error (HE) on Service Effectiveness (SE), statistically significant because the p-value is less than 0.05. This illustrates that human error not only affects the personal development of individuals, but also directly affects the effectiveness of the service as a whole. In this context, human error can be considered as a hindrance to organizations in achieving their goal of providing effective services to customers or stakeholders (Maisuri & Rusdi, 2021; Orhan et al., 2022).

H3 shows a positive effect of Self-Development Improve (SDI) on Service Effectiveness (SE), statistically significant because the value-p is less than 0.05. This suggests that efforts to improve the personal development of individuals directly contribute to the improvement of the effectiveness of services. In other words, the higher the level of self-development of individuals, the more effective services they can provide (Kohlström, 2022; Lyons & Bandura, 2019).

H4 shows the indirect effect of Human error on Service Effectiveness (SE) through Self-Development Improve (SDI), statistically significant because the value of p-p is less than 0.05. This means that higher human error will reduce Self-Development Improve and ultimately will also reduce service effectiveness. Humanerror not only affects the effectiveness of services directly, but also through their influence on individual personal development. It highlights the importance of addressing the problem of human error not only as a direct obstacle to service effectiveness, but also as a factor affecting individuals' ability to thrive and deliver better services.

Overall, the results of this study underscore the importance of understanding and managing human error in the context of self-development and service effectiveness. By identifying complex relationships between these variables, organizations can take more effective steps to improve overall individual and organizational performance.
The managerial implications of this research can provide valuable guidance for organizations in managing human error, improving individual self-development, and improving the effectiveness of their services. Organizations need to pay special attention to employee development to reduce the negative impact of human error. Structured training and development programs can help raise awareness of human error, refine skills, and improve an individual's ability to manage stress and pressure that can lead to human error. By paying attention to these managerial implications, organizations can take concrete steps to reduce human error, improve individual self-development, and improve overall service effectiveness. This will not only help improve the performance of the organization, but also increase customer or community satisfaction.

6. Conclusion

This study confirms a significant relationship between Human Error (HE), Self-Development Improve (SDI), and Service Effectiveness (SE). The findings suggest that human error has a negative impact on an individual's self-development and overall service effectiveness. However, improvements in individual self-development can offset the negative effects of human error and increase service effectiveness. The managerial implications of the study highlight the importance of focusing on employee development, risk management, improving service effectiveness, performance measurement, and the establishment of an organizational culture that supports growth and learning. By paying attention to these findings, organizations can take concrete steps to improve performance and achieve their goals more effectively.

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Biographies

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