Entrepreneur's assessment on e-governance implementation of a Philippine countryside municipality: The mediating effect of perceived trust

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Abstract

This study aims to explore entrepreneurs' assessment of e-governance implementation in a Philippine countryside municipality and investigates the mediating effect of perceived trust. The researcher utilized a cross-sectional research design among the 302 registered entrepreneurs in the locality. Findings revealed that entrepreneurs perceived moderately high e-governance implementation in terms of perceived usefulness, service quality, satisfaction level, and perceived trust. Findings also showed that perceived trust mediated the perceived usefulness, satisfaction level, and service quality and satisfaction level relationships. With the interconnectedness of these variables, policymakers and administrators may optimize those services that largely influence the constituents' confidence in the implementation of e-governance.

Keywords: e-governance, integrated business permit and licensing system, technology adoption, rural entrepreneurs, countryside municipality

JEL Classification Codes: O15, L26, O33, C43

1. Introduction

The Philippines is experiencing a digital revolution with a strong emphasis on e-governance. Traditional services are transformed into efficient, transparent, and accessible online processes (Bajar, 2020). This digital transformation simplifies the bureaucratic process, brings information within easy reach of everybody, and makes services available even in the most remote areas (Abales et al., 2023). Banking on the best global digital practices, the government is building trust, improving service delivery, and making this country competitive for the future (Chen et al., 2021). Most importantly, all these are supposed to enhance the quality of life for all its people.

Measuring the effectiveness of e-governance implementation is crucial as it enables adjustments and improvements (Suri, 2022). By tracking metrics like service usage, citizen satisfaction, and efficiency gains, policymakers can pinpoint shortcomings and refine their e-governance approach (Nawafleh & Khasawneh, 2024). Similarly, measuring impact helps build trust. Demonstrating tangible improvements, such as faster processing times or increased access for remote communities, fosters public confidence in digital initiatives (Wilson & Tewdwr-Jones, 2022). Moreover, the data collected serves as a valuable benchmark for other governments through global conversation on effective e-governance implementation by sharing successful strategies and highlighting potential pitfalls (Akpan-Obong et al., 2023; Manoharan et al., 2021).

Effectiveness in implementing e-governance has particularly been a focus for most researchers (Suri, 2022). Much research work has delved into the details regarding the measurement of it. Researchers have used various methodologies to examine the impact of e-governance on diverse dimensions, such as perceived usefulness, perceived trust, service quality, and satisfaction level (Bhuvana & Vasantha, 2021). The success of e-government services mainly depends on the individual users, so understanding the critical determinants in determining the use of e-government services is important (Sharma, 2015). The acceptance of e-government services is determined by individuals' attitudes towards use, social pressures, and perceptions about the services, the technology, and the services (Susanto & Aljoza, 2015). Many studies used perceived ease of use and perceived usefulness as the primary factor in individuals' decision and intention to use e-government services (Hamid et al., 2016; Mensah, 2019; Tahar et al., 2020; Sijabat, 2020).

Despite utilizing these measurement variables across various studies, a critical gap still needs to be found in understanding their interplay, particularly within rural settings (Vassilakopoulou & Hustad, 2023). While existing research offers valuable insights into individual variables like perceived ease of use, perceived usefulness, perceived trust, service quality, and satisfaction level, a deeper examination of how these factors interact and influence each other in e-governance implementation is necessary (Alkraiji, 2021). The reason is that rural areas have a unique socio-economic status, face infrastructural bottlenecks, and exhibit vast differences in the level of digital literacy that can affect proper success with initiative implementation (Cattaneo et al., 2022). A study on the interactivity of these variables in a rural setup will establish better insights into how e-governance can be tailored to serve rural communities better and bridge the digital divide.

With this gap, the impact felt in rural municipalities due to e-governance still needs to be discovered. The present study examines the e-governance implementation of a Philippine countryside municipality and the mediating effect of perceived trust from the purview of rural entrepreneurs. The study explores how rural entrepreneurs perceive and interact with e-governance systems. Moreover, it contributes to the general discussion on e-governance in developing countries, particularly at the local or countryside level. The importance of trust as a mediating factor has been contributed to by supplementing the increasing bank of knowledge on trust in digital government services. It can inform future research and policy discussions on building and maintaining user confidence in e-governance systems, fostering greater acceptance and adoption.

2. Theoretical and conceptual framework

The united theory of acceptance and use of technology model (UTAUT) (Venkatesh et al., 2003) is a widely used framework in information systems research, combining elements from the expectancy-value theory (Eccles-Parsons et al., 1983) and the technology acceptance model (Davis, 1989). It identifies key factors influencing technology adoption, including performance expectancy (belief in the technology's ability to help achieve goals), effort expectancy (perceived ease of using the technology), social influence (perception of important others' approval), facilitating conditions (availability of support), perceived usefulness (benefits), and perceived trust (reliability and security).

An important aspect of the UTAUT model is its acknowledgment of trust's indirect influence on technology adoption. Trust can impact a person's decision to use technology by enhancing perceptions of its usefulness and service quality (Alkraiji & Ameen, 2022).

Moreover, the model recognizes contributions from other theories, such as the expectancy-value theory and the technology acceptance model, represented through arrows pointing to the UTAUT constructs (see Figure 1). This comprehensive approach helps understand technology adoption in various contexts, including e-governance systems, mobile apps, and enterprise software.

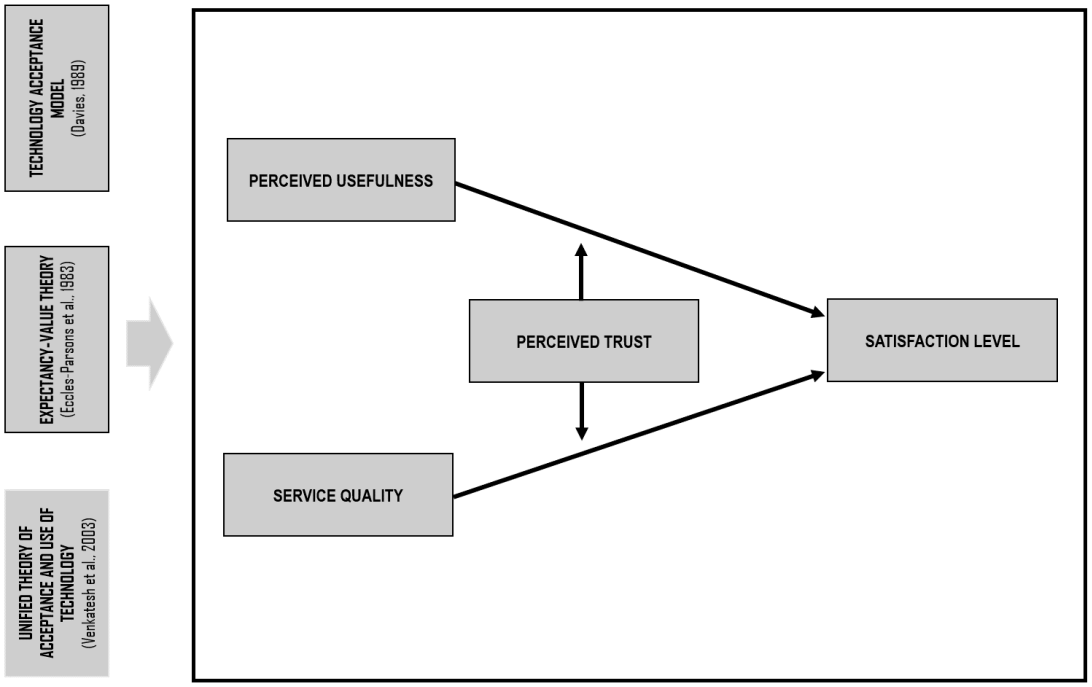

Figure 1. Framework of the study

Meanwhile, the technology acceptance model (TAM) can also provide a theoretical basis for understanding the factors influencing the adoption and use of e-governance systems in rural areas (Mohammad Ebrahimzadeh Sepasgozar et al., 2020). TAM suggests that perceived usefulness and ease of use are key determinants of user acceptance and adoption of technology (Chen & Aklikokou, 2020). Applying this framework to the context of rural e-governance implementation can help identify strategies for enhancing the perceived usefulness and ease of use of e-governance systems among rural users (Bhuvana & Vasantha, 2021). Moreover, exploring the role of social capital and trust in e-governance adoption can provide insights into how trust is formed and maintained in rural communities, influencing their willingness to engage with e-governance initiatives (Gupta et al., 2021).

3. Literature review

3.1 E-governance implementation in rural areas

E-governance implementation in rural areas presents unique challenges and opportunities, particularly in developing countries like the Philippines (Abales et al., 2023). Understanding these dynamics is crucial for effective rural municipal public service delivery and governance (Legaspi & Marigza, 2021). One of the key challenges is the need for adequate infrastructure, including internet connectivity and technological resources, which are essential for e-governance initiatives to function effectively (Abdulnabi, 2024). Limited internet access in rural areas can hinder the adoption of e-governance platforms and services, limiting their reach and impact on local communities (Patnaik & Dixit, 2023). Moreover, the availability of human resources with the necessary skills and knowledge to manage and maintain e-governance systems is often limited in rural settings, posing a barrier to successful implementation (Abdulnabi, 2024).

Despite these challenges, there are also significant opportunities associated with e-governance implementation in rural areas. E-governance can potentially improve the efficiency and transparency of government services, making them more accessible and responsive to the needs of rural communities (Batool et al., 2021). Case studies and best practices from other countries and regions can provide valuable insights into successful strategies for overcoming challenges and maximizing the benefits of e-governance in rural settings (Ullah et al., 2021). For example, community engagement and participatory approaches can play a crucial role in ensuring that e-governance initiatives are inclusive and responsive to the needs of local communities (Michael, 2023).

3.2 Perceived trust in e-governance

Perceived trust in e-governance systems is a critical factor influencing such initiatives' adoption and success (Saleh & Alyaseen, 2021). Understanding how trust is formed, maintained, and influenced by various factors is essential for policymakers and implementers to design effective e-governance strategies (Pandey, 2023). Empirical studies have shown that trust in e-governance is influenced by factors such as the system's transparency, reliability, and accountability (Hartanto et al., 2021).

The importance of user perceptions and experiences can shape trust in e-governance (Pandey, 2023). A user's previous interactions with e-governance systems and their perceptions of the system's responsiveness to their needs can significantly impact their trust in the system (Saleh & Alyaseen, 2021). Social influence and peer recommendations

in shaping trust in e-governance must be considered (Kompella, 2020). Studies have shown that users are more likely to trust e-governance systems if they see others in their social network using and endorsing the system (Hartanto et al., 2021).

Furthermore, the role of trust in shaping user behavior and attitudes towards e-governance initiatives is crucial (Naik et al., 2021). High levels of trust can lead to increased user engagement, participation, and satisfaction with e-governance services (Pandey, 2023). Conversely, low levels of trust can lead to skepticism, disengagement, and even resistance to e-governance initiatives (Li, 2021). Understanding these dynamics is essential for policymakers and implementers to design interventions that build and maintain user trust.

4. Methodology

The research utilized a cross-sectional design to assess the factors that impact entrepreneurs' adoption of integrated business permits and licensing systems (iBPLS) implemented by a countryside municipality in the Philippines. 302 out of 498 registered businesses participated in the survey. This study used a self-designed survey questionnaire consisting of two sections. The initial section identifies the socio-demographic traits of the entrepreneurs. The next section evaluates the degree of acceptance in iBPLS by considering perceived usefulness, service quality, satisfaction level, and perceived trust. The Likert scale was used to rate every indicator in every variable. The researchers validated the questionnaire through pilot testing to determine its internal consistency and reliability. The Cronbach alpha findings indicated an acceptable range of 0.875 to 0.905. The research used descriptive analysis such as weighted mean, frequency, and percentage. The researchers also utilized Pearson r to assess the correlation between the variables and mediation analysis to ascertain the impact of perceived trust on the relationship between service quality and satisfaction, as well as perceived usefulness and satisfaction.

5. Results

5.1 Respondent's socio-demographic characteristics

Table 1 shows the respondent's characteristics. Most respondents were women (72.18%) between 31 and 50, married (60.27%), and college-educated (35.76%). Most companies were in wholesale and retail trade (75.83%), had less than 3 million pesos in assets, and employed more than ten people (95.70%). The entrepreneurial experience was varied, slightly favoring those with 3-5 years of experience. Social media (44.37%) was the most common way to access the internet, followed by email (11.92%), with most families earning less than 10,000 pesos monthly (63.91%).

Table 1. Description of the respondent's socio-demographic characteristics.

Socio-demographic characteristics	**Frequency** n=302	**Percentage**
Gender		
Male	84	27.82
Female	218	72.18
Age (*in years*)		
21-30	38	12.58
31-40	71	23.51
41-50	73	24.18
51-60	69	22.85
60 above	51	16.88
Highest educational attainment		
Elementary undergraduate	25	8.28
Elementary graduate	18	5.96
High school undergraduate	34	11.26
High school graduate	65	21.52
Vocational undergraduate	6	1.99
Vocational graduate	4	1.33
College undergraduate	40	13.25
College graduate	108	35.76
Post-baccalaureate graduate	2	0.65
Marital status		
Single	112	37.09
Married	182	60.27
Separated	5	1.66
Annulled	3	0.98
Asset size (*in Philippine pesos*)		
Less than 3,000,000	302	100.00
Employment size (*number of employees*)		
Less than 10	289	95.70
10-99	11	3.64
100-199	2	0.66
Industry type (*multiple responses*)		
Wholesale and retail trade	229	75.83
Manufacturing	1	0.33
Repair of motor vehicles and motorcycles	11	3.64
Financial and insurance activities	8	2.65
Accommodation and food service	17	5.63
Other service activities	12	3.97
Other industry sectors	25	8.28
Entrepreneurial experience (*in years*)		
Less than 2	57	18.87
3-5	88	29.14
6-10	62	20.53
More than 10	95	31.46

Table 1. (Continued) Description of the respondent's socio-demographic characteristics.

Socio-demographic characteristics	Frequency n=302	Percentage
Monthly family income (*in Philippine pesos)*		
Below 10,000	193	63.91
10,000-20,000	44	14.57
21,000-30,000	23	7.62
31,000-40,000	5	1.66
41,000-50,000	10	3.31
51,000-60,000	2	0.67
61,000-70,000	8	2.65
Above 70,000	17	5.63
Internet usage (*multiple responses*)		
Email communication	36	11.92
Online sales and e-commerce	8	2.65
Research and information gathering	10	3.31
Accessing government services and information	5	1.66
Online banking and financial transactions	17	5.63
Social media	134	44.37
Online marketing	15	4.97
Others	108	35.76

5.2 Entrepreneurs' assessment of e-governance implementation

Table 2 provides descriptive statistics of the entrepreneurs' assessment of e-governance implementation, including the mean, standard deviation, and qualitative description for each variable. The descriptive statistics suggest that, on average, entrepreneurs have moderately high perceptions of the usefulness, service quality, satisfaction, and trust in e-governance implementation. These findings indicate a generally positive assessment of e-governance among the entrepreneurs in the study.

Table 2. Descriptive statistics of the entrepreneurs' assessment on e-governance implementation.

Variables	Mean	Std. Deviation	Description
Perceived usefulness	4.021	.752	Moderately high
Service quality	4.010	.774	Moderately high
Satisfaction level	3.955	.804	Moderately high
Perceived trust	4.003	.766	Moderately high

Note: *1.00-1.79-Very low; 1.80-2.59-Low; 2.60-3.39-Average; 3.40-4.19-Moderately high; 4.20-5.00-Very high*

Table 3 presents correlation statistics of the entrepreneurs' assessment of e-governance implementation, showing the relationships between different variables. The table indicates strong positive correlations between the various aspects of entrepreneurs' assessment of e-governance implementation, including perceived usefulness, service quality, satisfaction level, and perceived trust. These correlations suggest that a positive evaluation in one aspect is also associated with positive assessments in other elements.

Table 3. Correlation statistics of the entrepreneurs' assessment on e-governance implementation.

Variables	**1**	**2**	**3**	**4**
Perceived usefulness	-			
Service quality	.832***	-		
Satisfaction level	.788***	.885***	-	
Perceived trust	.820***	.863***	.842***	-

Note: * *p<.05; ** p<.01; *** p<.001;* ^{ns} *not significant*

5.3 Mediation analysis using perceived trust as a mediator between service quality and satisfaction level on e-governance implementation

Table 4 explains how perceived trust influences the relationship between service quality and satisfaction level among entrepreneurs. The percentage of mediation provided in the table (30.1%) indicates that perceived trust accounts for approximately 30% of the total effect of service quality on satisfaction level. While service quality directly impacts satisfaction level, a significant portion of this impact is mediated by the level of trust entrepreneurs have in the e-governance system. The study emphasizes the role of perceived trust in linking service quality to the satisfaction level of entrepreneurs in e-governance implementation.

Table 4. Mediation estimates caused by perceived trust on the service quality and satisfaction level relationship.

Effects	*B*	*SE*	*z*-value	*p*-value	*%* Mediation
Direct	.642	.052	12.324	<.001	69.9
Indirect	.277	.046	6.031	<.001	30.1
Total	.919	.028	32.960	<.001	100.0

Table 5 presents the path estimates among the three variables—perceived trust, satisfaction level, and service quality. The path estimate for perceived trust and satisfaction level is 0.324, indicating that perceived trust has a positive and significant

effect on satisfaction (p<.001). It suggests that when entrepreneurs perceive higher levels of trust in the e-governance system, their satisfaction with the system also tends to increase. Meanwhile, the path estimate for service quality and satisfaction level is 0.642, indicating a strong positive effect of service quality on satisfaction (p<.001). It implies that higher perceived service quality leads to higher satisfaction among entrepreneurs with the e-governance system.

Table 5. Path estimates among the three variables.

			B	*SE*	*z*-value	*p*-value
Perceived trust	—	Satisfaction level	.324	.053	6.159	<.001
Service quality	—	Satisfaction level	.642	.052	12.324	<.001
Service quality	—	Perceived trust	.854	.029	29.742	<.001

On the other hand, the path estimate for service quality and perceived trust is 0.854, indicating a strong positive effect of service quality on perceived trust (p<.001). It suggests that when entrepreneurs perceive the e-governance system as high quality, they trust it more. These path estimates highlight the importance of perceived trust and service quality in influencing entrepreneurs' satisfaction with e-governance implementation. Higher levels of perceived trust and service quality are associated with higher satisfaction levels, indicating that efforts to improve these aspects of e-governance can lead to more positive outcomes for entrepreneurs.

5.4 Mediation analysis using perceived trust as a mediator between perceived usefulness and satisfaction level on e-governance implementation

Table 6 presents mediation estimates indicating the role of perceived trust in mediating the relationship between perceived usefulness and satisfaction level among entrepreneurs using e-governance. These findings suggest that while perceived usefulness directly influences satisfaction levels, perceived trust also plays a crucial role in enhancing this relationship. Improving perceived usefulness and trust in e-governance systems can lead to higher satisfaction levels among entrepreneurs.

Table 6. Mediation estimates caused by perceived trust on the perceived usefulness and satisfaction level relationship.

Effects	*B*	*SE*	*z*-value	*p*-value	% Mediation
Direct	.319	.055	5.802	<.001	37.8
Indirect	.524	.050	10.540	<.001	62.2
Total	.843	.038	22.273	<.001	100.0

Table 7 presents the path estimates among the three variables—perceived trust, satisfaction level, and perceived usefulness—highlighting their relationships. The path estimate for the relationship between the perceived trust and satisfaction level is 0.628, indicating a strong positive effect of perceived trust on satisfaction ($p<.001$). It suggests that when entrepreneurs perceive higher levels of trust in the e-governance system, their satisfaction with the system also tends to increase. On the other hand, the path estimate for the perceived usefulness and satisfaction relationship is 0.319, indicating a positive effect of perceived usefulness on satisfaction level ($p<.001$). It suggests that when entrepreneurs perceive the e-governance system to be useful, their satisfaction with the system tends to increase, although the effect is not as strong as perceived trust.

Table 7. Path estimates among the three variables.

			B	*SE*	*z*-value	*p*-value
Perceived trust	—	Satisfaction level	.628	.054	11.634	<.001
Perceived usefulness	—	Satisfaction level	.319	.055	5.802	<.001
Perceived usefulness	—	Perceived trust	.835	.034	24.895	<.001

Meanwhile, the path estimate for the perceived usefulness and perceived trust is 0.835, indicating a strong positive effect of perceived usefulness on perceived trust ($p<.001$). It suggests that when entrepreneurs perceive the e-governance system as useful, they trust it more. These path estimates highlight the importance of perceived trust and usefulness in influencing entrepreneurs' satisfaction with e-governance implementation. Higher levels of perceived trust and usefulness are associated with higher satisfaction levels, indicating that efforts to improve these aspects of e-governance can lead to more positive outcomes for entrepreneurs.

6. Discussion and implications

This section delves into the implications of the study's findings, exploring their significance within the broader context. By examining the results through various lenses, this section aims to uncover practical applications, inform future research directions, and provide insights for policymakers and practitioners.

First, entrepreneurs' moderately high perceptions of e-governance offer a promising sign for businesses and governments. Their positive views suggest they continue using and adopting e-governance services, potentially leading to smoother business operations. Additionally, research shows that high trust in e-governance can translate to a broader

trust in government institutions (Hartanto et al., 2021; Pandey, 2023; Akpan-Obong et al., 2023). This positive perception can catalyze further innovation and investment in e-governance (Lyulyov et al., 2024). Entrepreneurs who experience efficient e-governance services are more likely to support initiatives and invest in solutions that improve the system. Policymakers can leverage these findings to justify and guide investments in e-governance infrastructure and services. By improving service quality and meeting entrepreneurs' needs, governments can create an environment that fosters business growth and strengthens the economy.

Second, strong positive correlations paint a clear picture of how entrepreneurs view different aspects of e-governance, like its usefulness, service quality, satisfaction level, and perceived trust. It suggests that entrepreneurs must systematically evaluate these aspects rather than forming a holistic impression of the entire system. This interconnectedness highlights the critical role of trust. High trust acts as a multiplier, amplifying the positive effects of good service quality and perceived usefulness (Korbi & Boussaidi, 2023; Pandey, 2023). Conversely, a lack of trust can magnify even minor issues (Alkraiji & Ameen, 2022). Policymakers and implementers should consider these findings when designing e-governance initiatives, focusing on improving one aspect, such as service quality, to positively influence other elements and enhance the overall user experience.

Third, user satisfaction in e-governance hinges on two intertwined aspects: service quality and trust. High-quality services, like efficient interfaces, accurate information, and timely responses, directly contribute to satisfaction (AlBalushi, 2021). However, trust acts as a booster. Users who trust the system and the government behind it are more likely to ignore minor inconveniences (Adeodato & Pournouri, 2020). Building trust requires transparency about data practices and security measures, along with responsive channels for user feedback (Hesselman et al., 2020). The key is recognizing the synergy between these factors. A user-friendly system with clear communication fosters trust, leading to greater satisfaction (Pandey, 2023). Conversely, a trustworthy system can overcome minor service issues. By taking a holistic approach that tackles service quality and trust-building, e-governance systems can create a powerful combination that maximizes user satisfaction and fosters a more engaged citizenry.

Lastly, for e-governance to truly thrive, entrepreneurs' satisfaction is key. The study highlights the importance of perceived usefulness and trust. By improving user interfaces and functionalities, e-governance systems can become more valuable and relevant to

entrepreneurs, directly boosting satisfaction (Sharma et al., 2021). Building confidence through transparent communication and reliable services strengthens the system's credibility, leading to higher satisfaction (Alkraiji & Ameen, 2022). Policymakers should prioritize strategies that enhance usefulness and trust, maximizing user satisfaction and ensuring the effectiveness of e-governance initiatives.

7. Conclusions and recommendations

The results of the study show that entrepreneurs are largely satisfied with the adoption of e-governance systems. The research also uncovered a substantial mediating impact of perceived trust. It implies that the level of trust entrepreneurs have influences satisfaction levels in the e-governance system, which is influenced by service quality and perceived usefulness. These results agree with well-known theoretical frameworks like the unified theory of acceptance and use of technology, expectancy-value theory, and the technology acceptance model. These theories underscore the critical importance of these factors in deciding the uptake and approval of technological innovations.

Moreover, this paper advances the following strategies that both government agencies and entrepreneurs can implement to maximize the benefits of e-governance systems and enhance overall satisfaction:

1. Government agencies should prioritize enhancing service quality to maintain high levels of entrepreneur satisfaction. Continual assessment and improvement of response time, accuracy, accessibility, and user-friendliness are crucial. Building trust through transparency, clear communication, and data security is equally important as it amplifies the positive impact of service quality on satisfaction. Moreover, measuring perceived usefulness and leveraging trust as a mediator can guide service enhancements and new development.
2. Entrepreneurs should actively utilize e-governance services to streamline business processes and improve efficiency. Providing feedback on the system is essential for its improvement. Developing trust in the system through experience can contribute to overall satisfaction. By taking advantage of e-governance services and providing constructive input, entrepreneurs can contribute to the system's growth and effectiveness.

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