

Digital Transformation Of Building Permit Systems In Cabanatuan City: Assessing Implementation Challenges, Risk Mitigation, And Strategic Management For Enhanced Public Service Delivery

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ABSTRACT

Digital transformation has become an important strategy for improving efficiency, transparency, and public service delivery in government operations. However, many local government units in the Philippines continue to rely on manual building permit processing systems, resulting in delays, limited accessibility, coordination issues, and operational inefficiencies. This study assessed the proposed digital transformation of the building permit processing system in Cabanatuan City by examining implementation challenges, risk mitigation strategies, strategic management practices, and their relationship with public service delivery. The study employed a quantitative descriptive–correlational research design involving engineers, architects, contractors, developers, and local government personnel directly engaged in the building permit process. Data were gathered using a structured five-point Likert scale questionnaire and analyzed using weighted mean, standard deviation, Pearson product–moment correlation coefficient, and Analysis of Variance (ANOVA). The findings revealed that respondents generally agreed that the current permit processing system experiences challenges related to processing efficiency, accessibility, and coordination among offices. Respondents also agreed that digital transformation can support effective risk mitigation, strategic management, and enhanced public service delivery in terms of efficiency, transparency, accessibility, and client satisfaction. Overall, the findings suggest that the proposed digital transformation of the building permit processing system may contribute to more efficient transactions, improved coordination, enhanced transparency, and better overall public service delivery in Cabanatuan City.

Keywords: digital transformation, building permit system, public service delivery, strategic management, risk mitigation, local government units, service supply chain

INTRODUCTION

Digital transformation has become an important strategy for improving efficiency, transparency, and accessibility in public administration. Governments worldwide continue to adopt digital technologies to modernize operations, streamline workflows, and improve citizen-centered service delivery (Vial, 2019). Digital governance initiatives have demonstrated the potential in reducing bureaucratic delays, strengthening transparency, and enhancing organizational efficiency within public institutions (United Nations, 2022).

In the Philippines, the government continuously promotes digitalization programs to improve public service delivery and operational efficiency among local government units (LGUs). Republic Act No. 11032, also known as the Ease of Doing Business and Efficient Government Service Delivery Act of 2018, encourages government agencies to simplify procedures, reduce processing time, and adopt more efficient systems. Despite these initiatives, many LGUs still rely heavily on manual systems, particularly in the processing of building permits and construction-related transactions. According to Santos and Mendoza (2020), local government units continue to experience challenges related to limited technological infrastructure, organizational readiness,

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and operational inefficiencies during digital transformation initiatives.

In Cabanatuan City, the current building permit processing system remains largely dependent on manual procedures. Stakeholders involved in permit processing, including engineers, architects, contractors, developers, and citizens, frequently encounter delays in application processing, limited accessibility, difficulty in tracking applications, and inefficient coordination among offices. These operational inefficiencies may negatively affect project implementation timelines, workflow efficiency, and public satisfaction with government services.

Digital transformation offers potential solutions through the implementation of online application systems, automated workflows, centralized databases, digital payments, and real-time application tracking. According to Villanueva and Cruz (2022), digitalization in local government operations contributes to improved efficiency, transparency, and service accessibility. However, the transition from manual to digital systems also presents implementation challenges related to cybersecurity, data privacy, organizational preparedness, technical support, and resource allocation (National Institute of Standards and Technology, 2020).

From a supply chain and logistics perspective, the building permit processing system may also be viewed as a service supply chain involving the flow of documents, information, approvals, and coordination among interconnected government offices. Similar to traditional supply chains, efficient service delivery requires effective coordination, timely processing, and workflow integration. Ellram et al. (2004) emphasized that service supply chains focus on information flow, coordination, and process integration among service providers and stakeholders.

Although several studies discuss digital governance and public sector modernization, limited localized studies focus specifically on the digital transformation of building permit processing systems within Philippine local government units, particularly in Cabanatuan City. Furthermore, limited empirical studies examine the relationships among implementation challenges, risk mitigation, strategic

management, and public service delivery within the context of digital permit systems.

Therefore, this study aims to assess the proposed digital transformation of the building permit processing system in Cabanatuan City by examining implementation challenges, risk mitigation strategies, strategic management practices, and their relationship with public service delivery.

2. METHODS

2.1 Research Design

This study employed a quantitative descriptive–correlational research design to assess the proposed digital transformation of the building permit processing system in Cabanatuan City and examine the relationships among implementation challenges, risk mitigation, strategic management, and public service delivery. The study also adopted a service supply chain perspective in analyzing workflow efficiency, coordination, and operational performance across multiple processing units.

2.2 Respondents

The respondents included stakeholders directly involved in the building permit process in Cabanatuan City, including civil engineers, architects, contractors, developers, and local government personnel. These participants provided both internal and external perspectives regarding system performance and public service delivery.

A purposive sampling technique was utilized to select individuals with relevant knowledge and direct experience in the building permit process. A total of 30 respondents participated in the study.

2.3 Instrument

The primary data gathering instrument was a structured questionnaire developed based on the objectives of the study and the review of related literature.

The questionnaire consisted of six parts: Part I – Respondent Profile, Part II – Implementation Challenges, Part III – Risk Mitigation, Part IV – Strategic Management, Part V – Public Service

Delivery, and Part VI – Recommendations. Each variable was measured using multiple indicators.

All items were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The questionnaire underwent reliability testing using Cronbach’s alpha to determine internal consistency. The instrument obtained a Cronbach’s alpha coefficient of 0.961, indicating excellent reliability and internal consistency.

2.4 Data Analysis

The collected data were analyzed using descriptive and inferential statistical techniques. Weighted mean and standard deviation were utilized to determine the level of implementation challenges, risk mitigation, strategic management, and public service delivery.

Pearson product–moment correlation coefficient (Pearson *r*) was used to determine significant relationships among the variables, while Analysis of Variance (ANOVA) was used to determine significant differences in responses when grouped according to respondent profile variables. All statistical analyses were conducted at a 0.05 level of significance.

2.5 Scope and Limitations

This study focuses on assessing the digital transformation of the building permit system in Cabanatuan City, Nueva Ecija, with emphasis on factors influencing public service delivery. It examines implementation challenges, risk mitigation strategies, and strategic management practices in relation to public service delivery.

The respondents include civil engineers, architects, contractors, developers, and local government personnel directly involved in the building permit process. Data were collected using a structured questionnaire with a five-point Likert scale.

The study is limited to respondents’ perceptions and does not involve the actual implementation or technical evaluation of a digital system. The findings were based solely on survey responses and statistical analysis. Furthermore, the results may not be

generalized to other local government units due to differences in systems, policies, and resources.

The study also interprets the building permit process within the context of service supply chain management, focusing on process flow, coordination, and system performance.

2.6 Ethical Considerations

Ethical standards were strictly observed throughout the conduct of the study. Participation was voluntary, and informed consent was obtained prior to data collection. The confidentiality and anonymity of the respondents were ensured at all times. All data were treated with strict confidentiality and used solely for academic purposes. This study complies with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173).

3. RESULTS AND DISCUSSION

This section presents the analysis and interpretation of data gathered from the respondents regarding the proposed digital transformation of the building permit processing system in Cabanatuan City. The data were analyzed using weighted mean and standard deviation to determine the respondents’ level of agreement regarding implementation challenges, risk mitigation, strategic management, and public service delivery.

The following scale was used in interpreting the computed weighted mean:

Scale	Range	Interpretation
5	4.21–5.00	Strongly Agree
4	3.41–4.20	Agree
3	2.61–3.40	Neutral
2	1.81–2.60	Disagree
1	1.00–1.80	Strongly Disagree

3.1 Implementation Challenges

3.1.1 Processing Efficiency

Statement	Mean	SD	Interpretation
The current permit processing system experiences delays in application processing.	3.43	1.15	Agree
Processing time in the current permit processing system is longer compared to digitalized systems.	3.67	1.14	Agree
Overall Mean	3.55	1.15	Agree

Table 1 presents the respondents’ assessment of processing efficiency in the current permit processing system.

The respondents agreed that the current permit processing system experiences delays and longer processing time compared to digitalized systems, with an overall mean of 3.55. This indicates that inefficiencies are evident in the existing manual process. The relatively moderate standard deviation values indicate that the respondents generally shared

similar perceptions regarding processing delays and inefficiencies.

The findings suggest that digital transformation may help improve the efficiency of permit processing by reducing delays and streamlining transactions.

3.1.2 System Accessibility

Statement	Mean	SD	Interpretation
Applicants experience difficulty in tracking the status of permit applications.	3.77	0.76	Agree
The current permit processing system lacks accessibility and convenience for users.	3.70	1.00	Agree
Overall Mean	3.74	0.88	Agree

Table 2 presents the respondents’ assessment of system accessibility.

The respondents agreed that the current system has accessibility limitations, particularly in tracking application status and providing convenience to users. The overall mean of 3.74 indicates that accessibility remains one of the challenges in the existing permit processing system.

The low standard deviation values imply that the responses were relatively consistent among respondents. This finding highlights the need for a more accessible and user-friendly digital platform that can provide real-time monitoring and easier access to permit services.

3.1.3 Coordination Among Offices

Statement	Mean	SD	Interpretation
There is poor coordination among offices involved in permit processing.	3.57	1.02	Agree
Data sharing between departments is inefficient.	3.57	1.02	Agree
Integration among systems used by different offices is limited.	3.63	0.98	Agree
Overall Mean	3.59	1.01	Agree

Table 3 presents the respondents’ assessment of coordination among offices involved in permit processing.

The respondents agreed that coordination and integration among offices remain limited within the current permit processing system. The overall mean of 3.59 indicates that interdepartmental coordination issues contribute to inefficiencies in permit processing.

The findings suggest that implementing a digitalized permit system may improve information sharing and coordination among concerned offices and departments.

3.2 Risk Mitigation

3.2.1 Data Security and Privacy

Statement	Mean	SD	Interpretation
Cybersecurity measures can be implemented to protect digital records.	3.70	1.07	Agree
Data privacy policies can be strictly enforced in the digital system.	3.67	1.11	Agree
Overall Mean	3.69	1.09	Agree

Table 4 presents the respondents’ assessment of data security and privacy.

The respondents agreed that cybersecurity measures and data privacy policies can be implemented effectively within a digital permit processing system. The overall mean of 3.69 indicates confidence in the ability of digital systems to maintain security and privacy.

mechanisms and data privacy policies to ensure the protection of sensitive records and information.

This further implies that maintaining data security and privacy is essential in building public trust and ensuring the successful adoption of digital permit processing systems.

These findings suggest that digital transformation initiatives should incorporate strong cybersecurity

3.2.2 System Reliability

Statement	Mean	SD	Interpretation
Backup systems can be utilized during system failures.	3.47	1.23	Agree
Contingency plans can be established for system downtime.	3.53	1.28	Agree
Overall Mean	3.50	1.26	Agree

Table 5 presents the respondents’ assessment of system reliability.

The respondents agreed that backup systems and contingency plans are necessary to maintain system reliability during failures or interruptions. The overall mean of 3.50 indicates positive perceptions regarding the capability of digital systems to manage operational risks.

However, the relatively higher standard deviation values indicate varied responses among participants, suggesting that some respondents may still have concerns regarding system reliability and continuity.

3.2.3 Risk Preparedness

Statement	Mean	SD	Interpretation
Personnel can receive adequate training on digital systems.	3.57	1.09	Agree
Technical support can be readily available when needed.	3.53	1.23	Agree
Regular system evaluations can be conducted to improve performance.	3.50	1.15	Agree
Overall Mean	3.53	1.16	Agree

Table 6 presents the respondents’ assessment of risk preparedness.

The respondents agreed that training, technical support, and system evaluations are essential in preparing organizations for digital transformation. The overall mean of 3.53 indicates positive perceptions regarding organizational readiness and risk preparedness.

The findings emphasize the importance of capacity-building programs, continuous technical support, and regular system monitoring to ensure effective implementation of digital transformation initiatives.

3.3 Strategic Management

3.3.1 Planning

Statement	Mean	SD	Interpretation
Clear plans can be established for digital transformation implementation.	3.70	1.00	Agree
Long-term strategies can be established for system improvement.	3.63	1.08	Agree
Overall Mean	3.67	1.04	Agree

Table 7 presents the respondents’ assessment of planning for digital transformation.

The respondents agreed that strategic planning and long-term strategies are important for successful digital transformation. The overall mean of 3.67 indicates that respondents recognize the value of proper planning in implementing digital permit systems.

This finding suggests that local government units should formulate comprehensive implementation plans and long-term strategies to support sustainable digital transformation.

3.4 Public Service Delivery

3.4.1 Service Efficiency

Statement	Mean	SD	Interpretation
A digital permit system can improve efficiency in public service delivery.	3.73	1.02	Agree
A digital permit system can reduce processing time for permit applications.	3.77	0.94	Agree
Overall Mean	3.75	0.98	Agree

Table 8 presents the respondents’ assessment of service efficiency.

The respondents agreed that a digital permit system can improve efficiency and reduce processing time in public service delivery. The overall mean of 3.75 indicates positive perceptions regarding the capability of digital transformation to streamline permit processing operations.

The relatively low standard deviation values indicate consistent responses among respondents. The findings suggest that digital transformation may contribute to faster and more responsive government services.

3.4.2 Transparency

Statement	Mean	SD	Interpretation
A digital permit system can promote transparency in permit processing.	3.80	0.88	Agree
Applicants can easily track the status of their applications through a digital system.	3.83	0.83	Agree
Overall Mean	3.82	0.86	Agree

Table 9 presents the respondents’ assessment of transparency in the permit processing system.

The respondents agreed that digital transformation can improve transparency and monitoring within the permit processing system. The overall mean of 3.82 indicates that respondents believe digital platforms can provide more transparent and trackable permit transactions.

The findings imply that digital systems may strengthen accountability and improve communication between government offices and applicants.

3.4.3 Accessibility

Statement	Mean	SD	Interpretation
Services can be easily accessible through digital platforms.	3.73	0.98	Agree
The digital system can be user-friendly for stakeholders.	3.67	1.03	Agree
A digital permit system can improve overall satisfaction with services.	3.77	0.94	Agree
Overall Mean	3.72	0.98	Agree

Table 10 presents the respondents’ assessment of accessibility and client satisfaction in public service delivery.

The respondents agreed that digital platforms can improve accessibility and user satisfaction in permit processing services. The overall mean of 3.72 indicates that digital transformation may help make government services more convenient and user-friendly.

The results suggest that implementing a digital permit processing system may enhance accessibility, improve user experience, and increase overall public satisfaction with government service delivery.

3.5 Correlation Analysis

Variable Pair	Pearson r	p-value	Interpretation
Implementation Challenges ↔ Public Service Delivery	0.05	0.792	Very Weak Positive, Not Significant

Risk Mitigation ↔ Public Service Delivery	0.87	< .01	Very Strong Positive, Significant
Strategic Management ↔ Public Service Delivery	0.87	< .01	Very Strong Positive, Significant

The analysis revealed a very weak positive and not statistically significant relationship between implementation challenges and public service delivery ($r = 0.05$, $p = 0.792$). This indicates that implementation challenges have minimal influence on public service delivery based on the perceptions of the respondents.

On the other hand, risk mitigation demonstrated a very strong positive and statistically significant relationship with public service delivery ($r = 0.87$, $p < .01$). This suggests that effective cybersecurity measures, system reliability, technical support, and organizational preparedness significantly contribute to improving the effectiveness of public service delivery within the proposed digital permit processing system.

Similarly, strategic management exhibited a very strong positive and statistically significant relationship with public service delivery ($r = 0.87$, $p < .01$). This indicates that strategic planning, leadership support, and proper resource allocation play important roles in supporting successful digital transformation initiatives and improving public service delivery.

The findings imply that strengthening organizational preparedness, strategic management practices, and risk mitigation strategies may significantly enhance the effectiveness of digital transformation initiatives in local government operations.

3.6 Analysis of Variance

Profile Variable	F-value	p-value	Interpretation
Profession	2.00	0.138	Not Significant
Years of Experience	2.86	0.056	Not Significant

The analysis of variance revealed no statistically significant difference in the responses of the participants when grouped according to profession ($F = 2.00$, $p = 0.138$). This indicates that respondents from different professional backgrounds generally share similar perceptions regarding the proposed digital transformation of the building permit processing system and its impact on public service delivery.

Similarly, no statistically significant difference was found in the responses when grouped according to years of experience ($F = 2.86$, $p = 0.056$). This suggests that the perceptions of respondents regarding implementation challenges, risk mitigation, strategic management, and public service delivery are generally consistent regardless of their professional experience.

The findings suggest that stakeholders involved in the building permit process have relatively similar perspectives regarding the importance of digital transformation initiatives in improving government service delivery and operational efficiency.

Summary of Findings

The findings indicated that respondents generally agreed that the current building permit processing system in Cabanatuan City experiences implementation challenges related to processing efficiency, accessibility, and coordination among offices. Respondents also agreed that digital transformation can support effective risk mitigation, strategic management, and improved public service delivery.

The study further revealed that risk mitigation and strategic management demonstrated very strong positive and statistically significant relationships with public service delivery. These findings indicate that cybersecurity measures, organizational preparedness, technical support, strategic planning, and resource allocation play important roles in supporting successful digital transformation initiatives within local government operations.

Overall, the findings suggest that the proposed digital transformation of the building permit processing system may improve efficiency, transparency, accessibility, coordination, and overall public service delivery in Cabanatuan City.

CONCLUSIONS AND RECOMMENDATIONS

4. CONCLUSIONS

The study concluded that the current building permit processing system in Cabanatuan City experiences operational challenges related to processing efficiency, accessibility, and coordination among offices. The findings further revealed that risk mitigation strategies and strategic management practices significantly contribute to improved public service delivery within the proposed digital permit processing system.

The study further indicated that digital transformation may enhance efficiency, transparency, accessibility, coordination, and client satisfaction in government service delivery. Effective strategic planning, cybersecurity protection, organizational preparedness, technical support, and resource allocation were identified as essential components in supporting successful digital transformation initiatives within local government operations.

Overall, the proposed digital transformation of the building permit processing system may contribute to faster transactions, improved workflow coordination, and more responsive public service delivery in Cabanatuan City.

a. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. The City Government of Cabanatuan should consider implementing a digitalized building permit processing system to improve efficiency, transparency, and accessibility of public services.
2. A centralized online platform for permit application, document submission, payment processing, and application tracking should be developed to reduce delays and improve coordination among offices.
3. Strong cybersecurity measures, data privacy protocols, backup systems, and contingency plans should be established to ensure the reliability and security of digital records and transactions.
4. Regular training programs and technical support should be provided to employees and personnel involved in permit processing to strengthen digital competencies and organizational readiness.
5. Adequate financial resources, technological infrastructure, and manpower should be allocated to support the successful implementation of digital transformation initiatives.
6. Future researchers may conduct similar studies involving other local government units or larger sample sizes to further validate and generalize the findings of the study.
7. Future studies may also incorporate system development, usability testing, or economic feasibility analysis to further evaluate the effectiveness of digital permit processing systems in public administration.

Respondents' Recommendations

The respondents provided several recommendations to improve the building permit processing system in Cabanatuan City. Most respondents recommended the implementation of a fully digitalized permit processing system that would allow online submission of requirements, real-time application tracking, digital payments, and online approval processing.

Many respondents emphasized the need to reduce processing time by establishing clear timelines, simplifying procedures, minimizing unnecessary

steps, and implementing a centralized “one-stop-shop” system. Respondents also suggested improving coordination among offices and departments involved in permit processing to eliminate bottlenecks and delays.

Several respondents highlighted the importance of transparency by allowing applicants to monitor the status of their applications in real time and by clearly publishing requirements, procedures, and approval updates. Respondents also recommended stronger cybersecurity measures, digital signatures, and secure online systems to protect records and prevent falsification.

Moreover, respondents suggested providing adequate personnel training, improving customer support services, strengthening internet connectivity, and allocating sufficient manpower to support the implementation of digital transformation initiatives.

Overall, the respondents supported the modernization and digitalization of the building permit processing system to improve efficiency, transparency, accessibility, coordination, and overall public service delivery in Cabanatuan City.

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