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PERFORMANCE OF LEGACY PROPRIETARY BILLING AND COLLECTION SYSTEM IN SAN PABLO CITY WATER DISTRICT: A BASIS FOR EFFICIENT IN-HOUSE SYSTEM DEVELOPMENT OF BILLING AND COLLECTION SYSTEM

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ABSTRACT

This study on the Performance of Legacy Proprietary Billing and Collection System in San Pablo City Water District was conducted using a descriptive method approach. This study hypothesized that there is no significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD for In-House System Development in the San Pablo City Water District. Using the descriptive research design, twenty (20) personnel of SPCWD, of which ten (10) from the Billing and Accounts Division of the Commercial Services Department as the authorized users of Billing Module, five (5) from the Treasury and Budget Division of Financial Management Department as authorized users of Collection Module, and five (5) from Information and Communication Technology Section of Office of the General Manager as the in-house system developers served as the respondents of the study. After the validity test of the experts, a self-constructed questionnaire was used as the main instrument to gather adequate data and information in this study to ensure they adequately represented the construct and administered the instrument to the selected respondents. The 4-Point Likert Scale and its Verbal Interpretation for Level of Performance were utilized to determine the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of user satisfaction, technical support, and scalability and the Level of Capability in terms of peopleware, hardware, software, and financial resources. Data were analyzed using descriptive and inferential statistical treatments such as weighted mean, standard deviation, and Pearson Product Movement Correlation Coefficient (r). Among the three indicators measuring the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD regarding user satisfaction, technical support and scalability was interpreted as "needs improvement." Four indicators measuring the Level of Capability of SPCWD for in-house System Development were found to be "very capable." These were peopleware, software, hardware, and financial resources. Therefore, the hypothesis stating that "there is no significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD for In-House System Development in San Pablo City Water District" was rejected. The following conclusions were drawn based on the findings: It suggests the necessity for refining user experience, enhancing technical support mechanisms, and ensuring scalability to accommodate future growth and demand. By addressing these areas, SPCWD can strive towards optimizing the performance of its billing and collection system, ultimately leading to higher levels of satisfaction and efficiency. Capability bodes well for SPCWD's ability to innovate, customize solutions, and address specific organizational needs through internal development efforts, fostering greater independence and flexibility in managing its technological infrastructure.; in-house system development allows SPCWD to create customized solutions tailored to its unique needs and operational requirements. This capability ensures that the software and hardware systems developed align closely with the organization's processes and workflows, potentially leading to improved efficiency and effectiveness.

OBJECTIVES

This study aimed to determine the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD as a basis for in-house development of the Billing and Collection System of SPCWD.

Specifically, it sought to answer the following questions:

1. What is the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of;
   1.1. User Satisfaction
   1.2. Technical Support
   1.3. Scalability
2. What is the level of capability of SPCWD for in-house system development in terms of;
   2.1. Peopleware
   2.2. Software
   2.3. Hardware
   2.4. Financial Resources

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3. Is there a significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD for in-house system development?
4. In view of the findings, what in-house system for billing and collection should be developed?

BACKGROUND

With its mission, "The San Pablo City Water District, A Corporation duly organized under PD 198 as amended, is tasked to contribute to the improvement of the quality of life of the residents of the San Pablo City by providing potable, adequate and affordable water supply in the entire city while remaining to be self-reliant and financially viable water district." Committed to delivering quality public service, the SPCWD acquired and implemented a computerized Billing and Collection System on 1995 from a private system provider.

The San Pablo City Water District is a government-owned utility responsible for providing water services to the residents of San Pablo City. Over the years, the Water District has used a legacy proprietary billing and collection system to manage its concessionaire accounts, meter readings, bill generation, and payment processing.

However, the legacy system has started to exhibit limitations and challenges that hinder the Water District's billing and collection process. These limitations include insufficient technical support, lack of scalability, insufficient integration capabilities, and difficulty accommodating regulatory requirements that affects user satisfaction. Specifically, pursuant to Executive Order (EO) No. 170 dated 12 May 2022, "ADOPTION OF DIGITAL PAYMENTS FOR GOVERNMENT DISBURSEMENTS AND COLLECTIONS," SPCWD is obliged to implement online payment of water bills through various online payment platforms without integrating the billing and collection system directly to the system of third-party online payment platforms, causing for manual encoding of all online payment transactions to the billing and collection system that become additional task to the user of billing and collection system.

In 2019, the private system provider of the legacy billing and collection system informed SPCWD that limited technical support could only be accommodated through phone or online support due to health reasons and the unavailability of personnel. All system enhancements and new requirements may take time to accomplish.

Given the exhibited limitations of the billing and collection system and conditions of the private system provider, SPCWD is considering the possibility of developing an in-house system. The in-house development offers the potential to overcome the limitations of the legacy system and achieve greater operational efficiency, accuracy, and user satisfaction.

To embark on developing an in-house billing and collection system, it is crucial to conduct a comprehensive study that assesses the current legacy system, identifies its limitations, and determines the feasibility and benefits of developing an in-house system. The study aims to serve as the basis for decision-making and guide development.

By conducting this study, the SPCWD can gather valuable insights into the existing system, understand the requirements and objectives for the new system, assess the feasibility of in-house development, and identify potential benefits and challenges associated with the implementation. The findings of the study will provide a solid foundation for the development of an effective, customized, and scalable billing and collection system that caters to the unique needs of the Water District and supports its mission to contribute to the improvement of the quality of life of the residents of the San Pablo City by providing potable, adequate and affordable water supply in the entire city while remaining to be self-reliant and financially viable water district.

RESEARCH DESIGN

The study used a descriptive research method to describe the procedures and data flow of the Legacy Proprietary Billing and Collection System of SPCWD. Also, the descriptive method was used to evaluate the performance regarding user satisfaction, technical support, and scalability of the legacy billing and collection system. Furthermore, the descriptive method was used to evaluate the capability of SPCWD in terms of peopleware, software, hardware, and financial resources for in-house system development.

POPULATION AND SAMPLING

Purposive sampling, also known as judgmental, selective, or subjective sampling, is a form of non-probability sampling in which researchers rely on their judgment when choosing members of the population to participate in their surveys, Alchemer (2021). Specifically, expert sampling was used in the study, which involves selecting individuals with expertise using the legacy proprietary billing and collection system of SPCWD. Expert sampling was chosen to collect data from the knowledgeable personnel of SPCWD currently using the billing ang collection system. Also, SPCWD personnel involved in system development and maintenance were selected as respondents for the study.

The twenty (20) personnel of SPCWD, of which ten (10) are from the Billing and Accounts Division of the Commercial Services Department as the authorized users of the Billing Module, five (5) from the Treasury and Budget Division of the Financial Management Department as authorized users of Collection Module, and five (5) from Information and Communication Technology Section of Office of the General Manager as the in-house system developers will be utilized as respondents for the study.

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LEVEL OF PERFORMANCE OF THE LEGACY PROPRIETARY BILLING AND COLLECTION SYSTEM OF SPCWD

Table 3 presents the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD regarding user satisfaction.

Table 3. Level of Performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of User Satisfaction

Statements	Mean	SD	Verbal Interpretation
1. It has an overall positive performance rating.	2.55	0.67	Satisfactory
2. It provides the system's speed and efficiency.	2.40	0.80	Needs Improvement
3. It has met your expectations regarding accuracy in billing and collection processes.	2.35	0.79	Needs Improvement
4. It is user-friendly.	2.55	1.02	Satisfactory
5. It has navigation and menu options that are intuitive and easy to understand.	2.50	1.07	Needs Improvement
Overall Mean	**2.47**	**0.83**	**Needs Improvement**

The average weighted mean value of 2.47 with a standard deviation of 0.83 revealed that the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD regarding user satisfaction was interpreted as **"needs improvement."**

This implies room for enhancement or modification in the Legacy Proprietary Billing and Collection System to meet users' needs and expectations better. This could involve addressing specific issues highlighted in the assessment or implementing changes to enhance user experience.

It indicates that user satisfaction is integral to the success of billing and collection system as it directly influences overall organizational impact, as it is integral to the success of billing and collection system as it directly influences productivity, cost efficiency, employee morale, and overall organizational impact.

In addition, there are likely issues or deficiencies in the system that negatively impact user satisfaction, such as user navigation, efficiency, and accuracy in billing and collection processes.

This comprehensive approach highlights the interconnectedness of various elements in creating a satisfactory user experience, underscoring the importance of a holistic design approach. It offered a comprehensive exploration of the multifaceted factors impacting user satisfaction. Their research encompassed system performance, usability, user experience design, and customer support. Doll and Torkzadeh (2018).

Table 4 presents the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of technical support.

Table 4. Level of Performance of the Legacy Proprietary Billing andCollection System of SPCWD in terms of Technical Support

Statements	Mean	SD	Verbal Interpretation
1. It shows the responsiveness of service provider technical support.	2.30	0.90	Needs Improvement
2. It provides accessibility to technical support channels (e.g., helpdesk, email, phone).	2.30	0.78	Needs Improvement
3. It has the overall quality of technical support provided for the Legacy System.	2.35	0.85	Needs Improvement
Overall Mean	**2.32**	**0.83**	**Needs Improvement**

The average weighted mean value of 2.32 with a standard deviation of 0.83 revealed that the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD regarding technical support was interpreted as **"needs improvement."**

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This implies that technical support for the billing and collection system is insufficient. This can result in delays or ineffective resolution of issues reported by users.

Users may be facing challenges or issues related to technical assistance, which could impact their overall experience with the system.
It indicates that technical support is essential for maintaining the integrity, security, and functionality of billing and collection system. It shows that the overall quality of technical support provided for the Legacy System needs improvement.

Competent technical support can greatly improve customer satisfaction by resolving issues promptly and providing users with the assistance they need. It ensures the continuity of an efficient and effective billing and collection system.

It helps maintain positive relationships with system users and ensures the continuing enhancement of the system.
Thus, based on the study conducted by Limoncelli et al. (2016), this guidance is extended by providing a thorough guide to system and network administration, which encompasses vital aspects of technical support. Their work emphasizes essential practices, troubleshooting techniques, customer service skills, and effective team management. This holistic perspective ensures that technical support professionals are well-rounded in their expertise and capable of handling a wide array of challenges.

It is essential for maintaining the integrity, security, and functionality of billing and collection system, ultimately contributing to the overall success of SPCWD.

Table 5 presents the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of scalability.

Table 5. Level of Performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of Scalability

Statements	Mean	SD	Verbal Interpretation
1. Handling of increased data volume without significant performance degradation.	2.75	1.04	Satisfactory
2. Adding new features or modules to the system without major disruptions.	2.35	0.96	Needs Improvement
3. System customization to meet evolving business requirements (ex., Online Payment such as Gcash and Maya).	1.80	1.03	Needs Improvement
4. Integrating with other applications or systems (ex., Accounting System, Geographical Information System (GIS)).	1.80	1.03	Needs Improvement
Overall Mean	**2.18**	**0.95**	**Needs Improvement**

The average mean value of 2.18 with a standard deviation of 0.95 revealed that the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD regarding scalability was interpreted as **"needs improvement."**

It implies that the current scalability of the billing and collection system is considered insufficient or below expectations. This suggests that users may have concerns about the system's ability to handle new requirements or increased demands effectively.

It shows that scalability is a strategic aspect of a system that allows to adapt to changing requirements and conditions.
In this connection, Kozuch and Satyanarayanan (2013) emphasize the prescient wisdom of considering scalability right from the inception of system design. They advocate for the integration of components like load balancers, distributed databases, and microservices, which are integral to the architecture of scalable systems. Their approach reinforces the idea that scalability is not merely an afterthought but a fundamental aspect of system architecture.

Level of Capability of SPCWD for an In-house System Development

Table 6 presents the SPCWD's level of capability for in-house system development in terms of peopleware.

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Table 6. Level of Capability of SPCWD for an In-house System Development in terms of Peopleware

Statements	Mean	SD	Verbal Interpretation
1. The IT team at SPCWD possesses the necessary technical skills and knowledge for system development.	3.70	0.46	Very Capable
2. There is a dedicated team responsible for software development and maintenance.	3.75	0.43	Very Capable
3. SPCWD provides ongoing training opportunities for staff to enhance their technical skills.	3.60	0.49	Very Capable
4. Communication channels within the organization facilitates effective information sharing.	3.75	0.43	Very Capable
5. SPCWD demonstrates a willingness to adopt and adapt to new technologies.	3.95	0.22	Very Capable
Weighted Mean	**3.75**	**0.34**	**Very Capable**

The average weighted mean value of 3.75 with a standard deviation of 0.34 revealed that the level of capability of SPCWD for in-house system development in terms of peopleware was interpreted as **"very capable."**

It implies that SPCWD may have a highly skilled and experienced team of developers who possess the necessary technical expertise and domain knowledge to develop and implement the billing and collection system effectively.

Also, it suggests that personnel of SPCWD can led to high-performing
teams capable of delivering successful software solutions that meet the organizational needs.

SPCWD employs effective project management practices to plan, execute, and monitor development. This includes setting realistic goals, allocating resources efficiently, managing timelines and budgets, and addressing potential risks proactively.

SPCWD system development personnel possess the necessary technical skills and knowledge for system development.

SPCWD has a dedicated team responsible for software development and maintenance.

SPCWD provides ongoing training opportunities for staff to enhance their technical skills.

SPCWD has a communication channel within the organization to facilitate effective information sharing.

SPCWD are willing to adopt and adapt to new technologies. It boosts a culture of innovation by nurturing an environment where personnel empowered to experiment, take risks, and think outside the box without fear of failure.

This has been stressed by the research findings of Maag (2019), which address the integration of peopleware practices and tools in the software development process. This research discusses strategies for aligning human aspects with technical practices. It emphasizes the importance of harmonizing human and technical factors for optimal development outcomes.

Table 7 presents the SPCWD's level of capability for in-house system development in terms of software.

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Table 7. Level of Capability of SPCWD for an in-house System Development in terms of Software

Statements	Mean	SD	Verbal Interpretation
1. SPCWD employs modern and appropriate development tools and platforms for system development.	3.70	0.46	Very Capable
2. The development team follows established coding standards and best practices.	3.65	0.48	Very Capable
3. Code reviews and quality assurance processes are in place to ensure adherence to best practices.	3.45	0.50	Very Capable
4. SPCWD uses version control systems to manage code changes and revisions.	3.50	0.50	Very Capable
5. Comprehensive documentation is maintained for software projects, including code, architecture, and user guides.	3.50	0.50	Very Capable
6. SPCWD has robust testing processes, including unit testing, integration testing, and user acceptance testing.	3.70	0.46	Very Capable
7. SPCWD implements security best practices in software development to protect against vulnerabilities and breaches.	3.60	0.49	Very Capable
Weighted Mean	**3.59**	**0.42**	**Very Capable**

The average weighted mean value of 3.59 with a standard deviation of 0.42 revealed that the level of capability of SPCWD for in-house system development in terms of software was interpreted as **"very capable."**

It implies that the in-house development team can tailor the software precisely to the unique needs and requirements of SPCWD. This customization ensures that the software aligns perfectly with the organization's workflows and processes, maximizing efficiency and effectiveness.

By developing software in-house, SPCWD has full control over the development process, allowing them to prioritize tasks, manage resources, and adapt quickly to changing requirements. In-house development can be cost-effective in the long run compared to purchasing off-the-shelf solutions or outsourcing development to external vendors. While initial development costs may be higher, SPCWD can save money on licensing fees and ongoing support costs over time.

It was pointed out that the findings of Perry and Wolf (2014) present a roadmap for software architecture research, outlining key areas of focus and emerging trends in the field. This provides a structured approach to advancing research in software architecture, guiding future developments in the discipline.

Table 8 presents the level of capability of SPCWD for in-house system development in terms of hardware.

Table 8. Level of Capability of SPCWD for an in-house System Development in terms of Hardware

Statements	Mean	SD	Verbal Interpretation
1. SPCWD has hardware infrastructure to support in-house system development.	3.95	0.22	Very Capable
2. Hardware resources (e.g., servers and workstations) are regularly updated and maintained.	3.60	0.49	Very Capable
3. The hardware components are compatible with the software and applications used for development.	3.60	0.49	Very Capable
4. SPCWD conducts capacity planning to ensure that hardware resources meet the demands of system development.	3.85	0.36	Very Capable

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5. SPCWD has redundancy measures to prevent single points of failure in the hardware infrastructure.	3.65	0.48	Very Capable
6. SPCWD implements physical security measures to protect hardware resources from unauthorized access or damage.	3.70	0.46	Very Capable
Weighted Mean	**3.73**	**0.34**	**Very Capable**

The average weighted mean value of 3.73 with a standard deviation of 0.34 revealed that the level of capability of SPCWD for in-house system development in terms of hardware was interpreted as **"very capable."**

This implies that SPCWD's in-house hardware capability allows it to scale its infrastructure according to changing demands and growth requirements. The organization can adapt hardware configurations to accommodate increased workloads, new software features, or evolving technologies, ensuring scalability and flexibility.

SPCWD can maintain stringent quality control standards throughout the hardware development process. This includes rigorous testing, validation, and performance optimization to ensure that hardware components meet reliability, security, and efficiency criteria.

Also, SPCWD implements physical security measures to protect hardware resources from unauthorized access or damage, redundancy measures to prevent single points of failure, and hardware resources are regularly updated and maintained to support in-house system development.

Koushanfar and Devadas (2014) delve into using hardware-based data representations for security purposes. They explore the potential benefits and challenges of employing specialized hardware for data protection, providing insights into a promising approach to enhance security measures.

Overall, SPCWD's capability in in-house hardware development enables the organization to optimize its infrastructure, integrate seamlessly with software systems, achieve cost efficiency, leverage technical expertise, ensure scalability and flexibility, maintain quality assurance, and manage risks effectively. These factors contribute to successfully deploying and operating hardware solutions that support SPCWD's mission and objectives.

Table 9 presents the SPCWD's level of capability for in-house system development in terms of financial resources.

Table 9. Level of Capability of SPCWD for an in-house System Development in terms of Financial Resources

Statements	Mean	SD	Verbal Interpretation
1. The organization allocates a sufficient budget for in-house system development projects.	3.60	0.58	Very Capable
2. SPCWD invests in technology resources (e.g., software licenses and hardware upgrades) to support system development.	3.55	0.59	Very Capable
3. Financial resources are allocated for staff training and development in the context of system development.	3.60	0.58	Very Capable
Weighted Mean	**3.58**	**0.55**	**Very Capable**

The average weighted mean value of 3.58 with a standard deviation of 0. revealed that the level of capability of SPCWD for in-house system development in terms of financial resources was interpreted as **"very capable."**

It implies that SPCWD allocates financial resources strategically, prioritizing investments in technology and system development to support its core business objectives. This ensures that adequate funding is available for in-house development projects.

SPCWD allocates financial resources for staff training and development in the context of system development.
Developing systems in-house can be cost-effective in the long run compared to purchasing off-the-shelf solutions or outsourcing development to external vendors. By leveraging

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internal resources and expertise, SPCWD can avoid licensing fees, vendor lock-in, and ongoing support costs associated with third-party solutions.

SPCWD views in-house system development as a long-term investment in the organization's future. By building custom solutions tailored to its specific needs, SPCWD can realize significant returns on investment over time, including increased operational efficiency, improved customer satisfaction, and competitive advantage.

In this regard, Oluseye and Diugwu (2020) analyze how internal and external financial resources influence innovative performance, considering the moderating effects of firm size and age. This research offers a nuanced understanding of how financial resources interact with organizational characteristics to drive innovation.

SPCWD's capability in in-house system development in terms of financial resources stems from its strategic budget allocation, cost savings, efficient resource utilization, risk management practices, long-term investment perspective, strategic partnerships, financial stability, and rigorous cost-benefit analysis. These factors enable SPCWD to fund and sustain in-house development efforts that effectively support its mission and strategic objectives.

Table 10 presents the significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD as the basis for the in-house development of the Billing and Collection System of SPCWD.

Table 10. Significant Relationship of the Level of Performance of the Legacy Proprietary Billing and Collection System and the Level of Capability for In-House System Development of SPCWD

Variables	Overall Mean	df	Computed r-value	Remarks
Performance of the Legacy Proprietary Billing and Collection System	2.43	18	-0.54	*Significant*
Capability of SPCWD for in-house Development	3.66			

The table further revealed that the computed r-value -0.54 is beyond the critical r- r-value ±0.44, at a 0.05 significance level with 18 degrees of freedom. Therefore, the hypothesis stating that "*there is no significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD for In-House System Development in San Pablo City Water District"* is rejected.

It can be concluded that there is a negative correlation between the performance of the legacy proprietary billing and collection system and the capability for in-house system development at SPCWD. The legacy proprietary system performance in user satisfaction, technical support, and scalability required improvement. In contrast, the level of capability for SPCWD's in-house system development is perceived to be very high. There is a greater impetus for SPCWD to develop an in-house billing and collection system to address shortcomings and innovate solutions internally.

With an In-house System Development, SPCWD will retain full control over the entire development process, from conception to implementation. This control enables the organization to prioritize development efforts based on its strategic goals and address critical areas for improvement more effectively.

In-house system development offers SPCWD the flexibility to adapt quickly to changing requirements, emerging technologies, and evolving industry standards. This agility allows the organization to respond promptly to user feedback, incorporate new features, and make necessary adjustments to enhance system performance and usability.

By leveraging internal resources and expertise, SPCWD can avoid ongoing licensing fees, vendor lock-in, and other hidden expenses associated with external solutions.

In-house system development fosters knowledge retention and skill development among SPCWD staff. By actively participating in the development process, employees gain valuable experience, deepen their understanding of system architecture and functionality, and enhance their technical competencies, ultimately contributing to improved system performance and support capabilities. It ensures system development efforts align closely with SPCWD's organizational goals, mission, and values.

In the study of Da Silva (2014), where he systematically reviews and comprehensively explores various facets of software development sourcing by examining the factors that influence sourcing decisions and evaluating the impact of different sourcing strategies on project outcomes, the findings provide valuable guidance for organizations navigating software development projects.

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In-house system development is crucial in driving performance improvement for SPCWD by providing tailored solutions, control over the development process, flexibility and adaptability, cost-efficiency, knowledge control and continuous improvement, and strategic differentiation.

Leveraging its existing capability in in-house development, SPCWD can effectively address performance gaps and deliver solutions that meet its stakeholders' evolving needs while remaining a self-reliant and financially viable water district.

Further, this study recommends the In-house System Development program as a basis for an efficient billing and collection system for SPCWD.

SUMMARY

This study was conducted to examine the existing Legacy Proprietary Billing and Collection System in SPCWD and propose an innovative solution. This study aimed to enhance the billing and collection processes' operational efficiency and user satisfaction levels.

Specifically, it sought to answer the following research questions. 1. What is the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD in terms of 1.1. User Satisfaction, 1.2. Technical Support, and 1.3. Scalability. 2. What is the level of capability of SPCWD for in-house system development in terms of 2.1. Peopleware, 2.2. Software, 2.3. Hardware, and 2.4. Financial Resources. 3. Is there a significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD for in-house system development?

The study used descriptive research methods to describe the procedures and data flow of the Legacy Proprietary Billing and Collection System of SPCWD. Descriptive methods were also used to evaluate the performance regarding user satisfaction, technical support, and scalability of the legacy billing and collection system. Furthermore, descriptive methods were used to evaluate the capability of SPCWD in terms of peopleware, software, hardware, and financial resources for in-house system development.

The average weighted mean value of 2.32 with a standard deviation of 0.87 revealed that the level of performance of the Legacy Proprietary Billing and Collection System of SPCWD regarding user satisfaction, technical support and scalability was interpreted as “needs improvement.”
The average weighted mean value of 3.63 with a standard deviation of 0.41 revealed that the level of capability of SPCWD for in-house system development in terms of peopleware, software, hardware and financial resources was interpreted as “very capable.”

The results further revealed that the computed r-value -0.54 is beyond the critical r- r-value ±0.44, at a 0.05 level of significance with 18 degrees of freedom.

Therefore, the hypothesis stating that “there is no significant relationship between the level of performance of the Legacy Proprietary Billing and Collection System and the level of capability of SPCWD for In-House System Development in San Pablo City Water District” was rejected.

CONCLUSIONS

Based on the findings of the study, the following conclusions are made:

1. The researcher found out there are areas within the system that require attention and enhancement to meet users' expectations and requirements better. It suggests the necessity for refining user experience, enhancing technical support mechanisms, and ensuring scalability to accommodate future growth and demand. By addressing these areas, SPCWD can strive towards optimizing the performance of its billing and collection system, ultimately leading to higher levels
levels of satisfaction and efficiency.

2. The researcher discovered that SPCWD possesses the necessary human resources, software tools, hardware infrastructure, and financial resources to develop in-house systems effectively. The high score indicates the organization's strong foundation and readiness to undertake and successfully execute system development projects. This capability bodes well for SPCWD's ability to innovate, customize solutions, and address specific organizational needs through internal development efforts, fostering greater independence and flexibility in managing its technological infrastructure.

3. It can be concluded that in-house system development allows SPCWD to create customized solutions tailored to its unique needs and operational requirements. This capability ensures that the software and hardware systems developed align closely with the organization's processes and workflows, potentially leading to improved efficiency and effectiveness.

RECOMMENDATIONS

Based on the findings made and conclusions drawn, the following recommendations were implied:

1. Foster open communication channels with stakeholders, including end-users, management, and IT personnel. Solicit feedback and input from stakeholders throughout the enhancement process to ensure alignment with their needs and expectations. Implement a ticketing system to manage technical support queries efficiently. Document system architecture and technical support procedures. Regularly conduct performance testing and capacity planning to anticipate scalability needs.

By implementing these recommendations, SPCWD can effectively address the identified areas for improvement within the billing and collection system, leading to enhanced user satisfaction, operational efficiency, and long-term sustainability.

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2. Regularly update IT personnel training through formal and informal training programs. Also, the budget for future systems development and enhancements should continue to be aligned with evolving needs.

Through this, SPCWD can further enhance its capability for in-house system development, enabling the organization to customize solutions and address specific organizational needs effectively. This will ultimately contribute to greater independence, flexibility, and efficiency in managing the organization's technological infrastructure.

3. Establish processes for system maintenance, support, and enhancement of in-house systems post-deployment. Monitor system performance and user feedback to identify areas for optimization and improvement.

Aligning with this recommendation, SPCWD can leverage its capability for in-house system development to create tailored solutions that enhance operational efficiency, effectiveness, and user satisfaction. This approach ensures that software and hardware systems closely align with organizational processes and workflows, ultimately driving improvements in overall performance and outcomes as future researchers can carry out.

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