SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 6 | June 2023 - Peer Reviewed Journal

ASSESSMENT ON THE OPERATIONS OF SINILOAN WATER DISTRICT'S DIVISIONS: BASIS FOR THE PROPOSED REENGINEERING AND RATIONALIZATION OF SINILOAN WATER DISTRICT

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ABSTRACT
This study aimed to evaluate and assess the current state and conditions of the operational and administrative processes in the administrative and finance, commercial services, and engineering operations divisions of Siniloan Water District (SIWADI), and to determine if the status would be improved if the characteristics of a good process are exhibited by the processes in the three divisions mentioned. Analysis revealed that there are processes in all of the three divisions that can be greatly improved in terms of their robustness, cost-efficiency, being controlled and error-proofed, and being communicated, by adopting computerization, as most of them are still being executed manually. Although adopting the cloud computing technology is not rational at this time due to its expensive price because of the current business settings and market environment of the area of operations of Siniloan Water District (SIWADI), clearly define and document standard operating procedures (SOPs) for all critical processes. This ensures consistency and reduces the chances of errors caused by ambiguity or misinterpretation. Create a flowchart for all of the processes within the agency. By mapping out the steps involved in each process and visualizing them in a flowchart. It is recommended that all stakeholders be involved in the process to ensure accuracy and to receive feedback that could significantly benefit the agency and streamline the operations. Additionally, the agency should subscribe to cloud computing when it has become available at an affordable price.
KEYWORDS: *Assessment of operations, Reengineering, Business Process Improvement*

INTRODUCTION

Presidential Decree No. 198, also known as the "Provincial Water Utilities Act of 1973" declared by then President Marcos Sr., is the National Policy that favors and authorizes the local control of operation of a water system through the establishment and administration of water districts particularly to advance the water utility services in each locality. It was later amended by Presidential Decree No. 768, No. 1479, and Republic Act 9286.

Although Siniloan Water District (SIWADI) started without functioning infrastructure, offices, and employees after it was turned over to the Municipal Government of Siniloan by the National Waterworks and Sewerage Authority as a failed water supply system, it was able to establish itself as a water district through the Sangguniang Bayan Resolution (No. 19) in January of 1989. The management was then able to improve and expand its operations over the years by implementing Interim Improvement Project (IIP) through the assistance of the Local Water Utilities Administration (LWUA).

After decades of operation, SIWADI is have served thousands of concessionaires from over 200 service connections since 1989. The water district now also owns its office and no longer renting. Came with this improvement and expansion are processes that, as stated by Grint and Willcocks (2007), are successful during the past operations of the business, but may no longer suitable to the current times.

The primary purpose of this study is to assess the operational and administrative processes of the three (3) divisions of SIWADI. The processes were evaluated to determine if they are simple, robust, documented, controlled, communicated, and error-proofed. According to Piatt (2012), these characteristics constitute a desirable process. Afterwards, the evaluation will then form part of the proposal for reengineering and rationalization of SIWADI

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MATERIALS AND METHODS

This research was conducted based on the Business Process Improvement (BPI) methodologies. These are management approach that enabled the researcher to analyze and identify parts of the processes that can be improved or removed to streamline the operations and enhance the overall operational performance of Siniloan Water District (SiWaDi).

The Business Process Management (BPM) methodology was employed by the researcher. This type of process improvement methodology helped the researcher analyze the current operations of Siniloan Water District and identified processes that are causing delays or inefficiencies in, or that can be improved to enhance the overall business performance (Laoyan, 2021) of SIWADI.

Each process was evaluated based on any or all of the following eight characteristics: simple; robust; documented; controlled; communicated; error-proofed, that defines a good process (Piatt, 2012), cost-efficient, and customer-centric.

The evaluation conducted was particular to the following processes:

1. Administrative and Finance:
   - 1.1 Issuance of Service Connection Materials
   - 1.2 Request for Employee Records
   - 1.3 Application for Leave of Absence
   - 1.4 Request for Monetization of Leave Credits
   - 1.5 Disbursements
   - 1.6 Request to Cash Advance from Petty Cash Fund
   - 1.7 Reimbursement of Expenses from Petty Cash Fund
   - 1.8 Purchase Request for Goods (Items, Supplies and Materials) Through Public Bidding
   - 1.9 Purchase Request for Goods (Items, Supplies and Materials) Through Open Canvass
   - 1.10 Request and Issuance of Inventory Items
2. Commercial Services:
   - 2.1 Paying Off Water Bill and Connection Arrears
   - 2.2 Paying Off Water Bill and Connection to GCash
   - 2.3 Request for Change of Account Name
   - 2.4 Applying for Senior Citizen (Sc) Discount
3. Engineering and Operations:
   - 3.1 Applying for New Service Connection
   - 3.2 Applying for Service Reconnection
   - 3.3 Request for Repair
   - 3.4 Request for Transfer of Service Line and Water Meter

RESULTS AND DISCUSSIONS

Process Status

Table 1. Summary of Status

Division	Process									
	A	B	C	D	E	F	G	H	I	J
Administrative & Finance	3.31	3.60	3.63	3.23	3.11	3.31	3.37	3.20	3.34	3.06
Commercial Services	4.40	3.74	4.37	4.66	-	-	-	-	-	-
Engineering & Operations	3.50	3.57	3.61	3.89	-	-	-	-	-	-

The Administrative and Finance Process A ("Issuance of Service Connection Materials") process' status achieved an overall mean of 3.31 which means "Neither agree nor disagree". Based on the data, the areas that can be improved on are in the updating of records in real-time, and the reduction of the execution time. Adopting computerization and similar technology will greatly improve these aspects of the process and will significantly reduce the execution time of the process (Rivers, 2014; Munday, 2019).

Process B or the Request for Employee Records of the Administrative and Finance division had an overall process mean of 3.60, "Agree". This indicates that the respondents agreed that in general, the process is good. However, based on the data, the execution

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time of the process needs to be improved as this aspect received low ratings from the respondents. Adopting the use of technology will make this process much better in terms of efficiency (BEM, 216; Indeed, 2021).

The Administrative and Finance Process A ("Request for Leave of Absence") has an overall process mean of 3.63 which also means "Agree". Although this indicates that the respondents agreed that in general, the process displays the characteristics of a good process, the data show that the execution time of this process is somewhat too long and must be improved. In view of this, and based on the response from the respondents, automation through computerization will enhance the recordkeeping aspect of this process, and significantly reduce its execution time. Longer execution time causes additional time and cost to the company, so it must be improved in terms of cost-efficiency (Saunders, 2016;Kiisel, 2016).

The Administrative and Finance Process D ("Request for Monetization of Leave of Credits") on the other hand, had an overall process mean of 3.23, which was equivalent to "Neither/Nor Agree". The data show there are several aspects of this process that can be improved to elevate its status. The main step that can be taken is computerization. This process is not automated based on the answers of the respondents. Utilizing the use of computers and making the system automated will help in the full utilization of employees since the number of employees that will be required to execute or perform this process will be reduced significantly. Records will be able to be updated real-time, and the execution time will be reduced to minimum (Breeden & Howe, 2019; Saunders, 2016).

The Administrative and Finance Process E or Disbursements, also had an interpretation of "Neither/Nor Agree" for its overall process mean of 3.11. The data show this process has a very short execution time. The areas for improvement are in process automation since this process is not automated, updating of records in real-time, and clarity on the level of who are needed to be involved in this process as the responses from the respondents suggest these aspects are not clear. As can be seen from the data, computerization of the disbursement process will increase the accuracy or the process (Rivers, 2014; Munday, 2019).

Similarly, Process F ("Request Cash Advance from Petty Cash Funds") of the Administrative and Finance division achieved an overall process mean of 3.31 equivalent to "Neither/Nor Agree". There are also several areas of this process that can be improved to elevate its status. As with the previous processes, automation through computerization will result to significant improvement in the process. Accuracy of the calculation and recordkeeping are two of the important aspects that will benefit, the number of employees and other resources will be greatly reduced when a computerized system is adopted (Rivers, 2014; Munday, 2019).

The Administrative and Finance Process G or the "Reimbursement of Expenses from Petty Cash Funds" process, had achieved an overall process mean of 3.37 which means "Neither/Nor Agree". The data showed that this process is taking longer time to be processed. The respondents also indicated that this process is not automated. Again, computerization will improve the process' record keeping and execution time significantly. These are the areas that will elevate the status of this process when improved (Indeed, 2022; York, 2022).

The Administrative and Finance Process H or the "Requests for Goods (Items, Supplies, Materials) Through Public Bidding" process also achieved an interpretation of "Neither/Nor Agree" for its overall process mean of 3.20. The aspects that can be improved to elevate the status of this process are process automation, the number of employees needed to execute this process, and the creation and dissemination of the process flow chart to make employees aware of the steps required to perform this process. Computerization will greatly improve these aspects. Since the company has an existing website, it can be utilized in the conduct of public bidding, electronic bidding makes it secure, accurate, and fast (Industrial Trainer, n.d.; Anderson & Vreeland, 2013).

Process I or the "Purchase Requests for Goods (Items, Supplies, Materials) Through Open Canvass" process of the Administrative and Finance division also achieved an interpretation of "Neither/Nor Agree" for its overall process mean of 3.34. It is very apparent based on the data gathered from the respondents' answers that computerization is a very important factor I the improvement of this and other processes. The number of employees to execute this process is part of the aspects that can be improved. If the process is computerized, it will be partially or fully automated and information about the process can be easily accessible to any employee that may be required to execute this process (Tallyfy, n.d.; Brinto, 2020).

The Administrative and Finance Process J ("Request for Issuance of Inventory Items") also has an interpretation of "Neither/Nor Agree" for its overall process mean of 3.06. The data revealed there are several areas that must be improved to elevate the status of this process. The primary area that must be worked on is automation. Computerizing this process will provide the authorized personnel easy access to related information and records pertaining to this process. An existing inventory management system may be adopted to significantly improve this process (Gaines, 2020; Were, 2021).

Process A or the "Paying of Water Bill and Connection Arrears" process of the Commercial Services division had an overall process mean 4.40 which was equivalent to "Strongly Agree". The data gathered indicate that this process displays the characteristics of a good process. This process does not improvement at the moment, although enhancement to the existing system will still result to a more efficient process (D'Heur, 2018; Munday, 2019).

The Commercial Services Process B ("Paying of Water Bill and Connection Arrears to GCash") on the other hand achieved an overall process mean of 3.74 that had an interpretation of "Agree". One area for improvement in this process is in updating the records

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since in real-time since the payments are received from third party (GCash). Improvement on the execution time is also beneficial for the elevation of the status of this process (Schiesser, 2012; Riant Data, 2021).

The Commercial Services Process C or the "Request for Change of Account Name" process had an overall process mean of 4.37 equivalent to "Strongly Agree". In view of this process, the data show that this process is good, except for a low mean (3.60) for the statement about automation. This process can be automated through computerization (Rivers, 2014; Munday, 2019).

Commercial services Process D ("Application for Senior Citizen Discount") achieved an overall process mean of 4.66 which has an interpretation of "Strongly Agree". Based on the data gathered, the aspect that can be improved is the execution time since the respondents agree that the execution time of this process is long (Rivers, 2014; Munday, 2019).

Process A or the Applying for New Service Connection process of the Engineering and Operations division achieved an overall process mean of 3.50 which is equivalent to "Agree". Data of the findings indicate the areas of updating records in real-time, process automation, and the number of employees required to perform this process, as the areas where improvement can be beneficial to the overall status of the process (Indeed, 2021; BEM, 2016).

Engineering and Operations Process B ("Applying for Service Reconnection") has an overall process mean of 3.57 which also means "Agree". Similar to the previous process, some areas can be improved to elevate the status of this process. The particular areas that can be improved are real-time updating of records, number of employees required for execution, and in automation (Kiisel, 2016; Talbert, 2020; Porteous, 2019).

Engineering and Operations Process C or the "Request for Repair" process has an overall process mean of 3.61, also means "Agree". Process automation is an area where improvement can be made that will significantly help the process. Making the records digitized will enable them to be maintained properly and for a longer period of time (Boyle, 2020; Spratling, n.d.).

Engineering and Operations Process D or the "Request for Transfer of Service Line and Water Meter" process with an overall process mean of 3.89 also means "Agree". The overall mean and the mean of each statement show that the status of the process is currently good (Donaldson, 2022; Piatt, 2012).

Table 2. Summary of Process (Administrative and Finance Division)

Summary of Process Characteristics for Admin & Finance Division

	Characteristic							
Process	**Simplicity**	**Cost-Efficiency**	**Customer-centricness**	**Robustness**	**Documentation**	**Control**	**Communication**	**Error-proof**
A	3.47	4.00	4.00	3.27	2.80	3.67	3.20	2.67
B	3.47	3.07	-	3.20	3.07	3.60	3.27	3.40
C	3.53	2.47	-	1.87	2.53	4.00	3.33	2.90
D	3.20	2.33	-	1.87	3.53	3.87	3.50	2.53
E	3.47	3.33	-	3.60	3.47	3.53	3.20	3.20
F	4.00	3.33	--	2.93	3.60	3.60	3.80	3.47
G	4.00	3.33	-	3.53	3.73	3.20	3.20	3.20
H	3.87	4.13	-	2.93	3.60	3.33	3.00	3.60
I	3.67	2.53	-	3.20	3.87	3.73	2.80	3.33
J	3.47	3.20	-	2.40	3.67	3.60	3.80	3.40

Among the processes in the administrative and finance division, only processes B & C (Request for Employee Records and Request for Leave of Absence) got the mean value interpretation of "Agree", indicating that the rest of the ten processes have the most improvements needed to elevate the level of their status to being good, as not all of the characteristics of a good process are exhibited fully. The primary areas that can be improved are process execution (which is mostly manual), process execution time, and the number of manpower required to execute the process; this is because based on the answers of the respondents, the number of employees in executing certain processes is uncertain.

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Volume: 8 | Issue: 6 | June 2023 - Peer Reviewed Journal

Simplicity, control, and customer-centricity are the primary characteristics exhibited by the processes in this division in terms of status. These processes require improvements in order for the other characteristics to be exhibited fully.

Table 4. Summary of Process (Commercial Services Division)
Summary of Process Characteristics for Commercial Services Division

	Characteristic							
Process	**Simplicity**	**Cost-Efficiency**	**Customer-centeredness**	**Robustness**	**Documentation**	**Control**	**Communication**	**Error-proof**
A	4.73	4.00	4.70	4.67	5.00	3.87	4.80	4.20
B	4.00	3.67	3.95	4.60	4.60	4.47	4.13	3.93
C	4.60	4.60	4.65	3.60	4.60	3.93	4.67	3.80
D	4.53	4.50	0.00	3.87	4.73	4.47	4.80	4.80

The findings that the only process that requires improvement to elevate the status of the processes in the commercial services division is "Paying of Water Bill and Connection Arrears to GCash". This is in the area of execution time, which is somehow taking longer period of time since the payment pass through a third party that SIWADI does not have control over the system. Although the rest of the processes have achieved higher mean values, there are still areas or aspects that can be improved particularly the mode of process execution since some, if not most, of the processes are performed manually and can be improved by computerization.

Based on the data gathered from the answers of the respondents, all of the processes in this division exhibit the characteristics of a good process, as each of the characteristic achieved a mean value interpretation of "Agree". This is because most, if not all, of the processes are partially or fully computerized

Table 5. Summary of Process (Engineering & Operations Division)
Summary of Process Characteristics for Engineering and Operations Division

	Characteristic							
Process	**Simplicity**	**Cost-Efficiency**	**Customer-centricness**	**Robustness**	**Documentation**	**Control**	**Communication**	**Error-proof**
A	3.75	3.92	3.88	3.58	3.83	3.75	4.00	3.92
B	3.58	4.08	4.19	4.00	4.08	3.92	4.33	4.00
C	4.00	4.08	4.13	4.13	4.08	3.75	4.08	4.08
D	3.75	3.94	4.38	3.92	4.08	4.08	4.25	4.00

The data showed that although all of the divisions' processes achieved a mean value of more than 3.40 (the minimum value to achieve a value interpretation of "Agree"), all of them require improvements in one or a couple of areas, and like in the other divisions, the aspects of improvement are in computerization and execution time.

Similar to the commercial services division, the processes of engineering & operations divisions are also exhibiting the characteristics of a good process, as they also achieved a mean value interpretation of "Agree" indicating that most, if not all of the processes are also computerized.

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Table 6. Correlation of Process Characteristics with Status

Characteristic	*R*	*P*	Strength of correlation
Simplicity	.57	<.001	Moderate
Cost-efficiency	.60	<.001	Moderate
Customer-centricity	.62	<.001	Moderate
Robustness	.50	<.001	Moderate
Documentation	.71	<.001	High
Controlled	.62	<.001	Moderate
Communicated	.76	<.001	High
Error-proofness	.65	<.001	Moderate

Note. No assumption violation of bivariate normality was found, Pearson r was used. Rows were extracted from the different processes of every division.

All the correlation coefficients are statistically significant at 05 level of significance. Also, all correlation coefficients are positive implying that as each level of process characteristic increases (the process is exhibited), there is an improvement in the status of the process.

The simplicity of the process is moderately correlated with its status and this correlation is statistically significant, r=.57, p<.001. The cost-efficiency of the process is moderately correlated with its status and this correlation is statistically significant, r=.60, p<.001. The customer-centricity of the process is moderately correlated with its status and this correlation is statistically significant, r=.62, p<.001. The robustness of the process is moderately correlated with its status and this correlation is statistically significant, r=.50, p<.001. The documentation of the process is highly correlated with its status and this correlation is statistically significant, r=.71, p<.001. The process being controlled is moderately correlated with its status and this correlation is statistically significant, r=.62, p<.001. The process being communicated is highly correlated with its status and this correlation is statistically significant, r=.76, p<.001. The process being error-proofed is moderately correlated with its status and this correlation is statistically significant, r=.65, p<.001.

After all these findings, it can be clearly inferred that improving the processes to exhibit the characteristics of a good process will elevate the status of the processes in each of the administrative and finance, commercial services, and the operations and engineering divisions. Conversely, improving the status will improve the characteristics of the processes.

CONCLUSIONS

It can be concluded that the current administrative and operational processes of the three divisions of Siniloan Water District (SIWADI) have not yet adapted fully to the use of technological tools available to businesses today, as many of the said processes are still performed manually.

It was also shown that computerization of most of the processes will highly enhance the company's operations. Cloud computing is the best solution to add robustness to the operation, while automation will ensure proper and safe record keeping of the processes' information and will keep the system running smoothly 24/7.

It can be concluded that as each level of process characteristic increases, the status of the process improves. This suggests that the process characteristics are important factors that contribute to the overall performance of the process.

RECOMMENDATIONS

Siniloan Water District has already received proposals for adapting to the cloud computing technology. However, the expense-to-benefit ratio of the proposal showed that the expense will outweigh the benefits at this time since this technology is still expensive in this area as there is not much competition among providers of similar services, and because most of the businesses in Siniloan have not adapted yet to the said technology. These reasons therefore make it irrational to adapt to such technology given the current business settings and market situation in SIWADI's area of operation.

Thus, it is recommended:

1. That SIWADI may consider using email as a primary mode of communication. Email offers a number of benefits, including speed, efficiency, and the ability to document and track communication. Additionally, email can be accessed remotely, making it a useful tool for remote work or distributed teams. The use of email in work has been shown to increase productivity, reduce misunderstandings, and facilitate collaboration. Therefore, SIWADI can provide training to employees on how to effectively use email as a communication tool, and establish guidelines on when email is appropriate to use.

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2. That administrative can connect all their computers to a local network (LAN) that will interconnect the divisions with specific privileges for each access, thereby making the transfer of documents instantaneous, secure, and without human intervention. Removing human intervention as much as possible will reduce or totally avoid the possibility of tampering.
3. For operations that require real-time updates, a simple program may be developed with a sole purpose of sending reports to a particular mobile number through the use of an inexpensive DATA SIM Card and mobile device that can be easily carried by hand. This is particularly useful in disconnection operations so the list of accounts for disconnection is always updated.
4. The office's operations maybe benchmarked against industry best practices and comparable organizations. They have to identify the areas where they may be falling behind and then implement relevant strategies to improve cost efficiency. Networking with peers and participating in industry forums can provide valuable insights and ideas.
5. That the standard operating procedures (SOPs) for all critical processes be clearly defined and documented. This ensures consistency and reduces the chances of errors caused by ambiguity or misinterpretation. A flowchart for all of the processes within the agency should be created and the steps involved in each process and should be mapped out in the flowchart. It is recommended that all stakeholders be involved in the process to ensure accuracy and to receive feedback that could significantly benefit the agency and streamline the operations.
6. Afterwards, training or lectures should be made for implementation and dissemination of the procedures and flow of the process to create much communicated processes.
7. Consider engaging external consultants or experts with experience in process optimization and simplification within the water industry. They can provide fresh perspectives and valuable insights to identify areas of improvement and recommend specific strategies to simplify complex processes.

The foregoing are initial recommendations. It is possible that if adopted, better ways of improvement will show up and prices may become cheaper in the future. It is therefore advised to expect such occurrence and adapt accordingly.

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SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 6 | June 2023 - Peer Reviewed Journal

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