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Implementation of Building Maintenance Management System in an Organization

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ABSTRACT

At present, most companies in Malaysia are still implementing the conventional method rather than implementing a modern omputerized system to manage the maintenance of building facilities and infrastructure [1]. The application of the conventional method is known as a paper-based report or a non-systematic computational database for facilities management. This research was conducted to study the issues faced by XYZ Bank Headquarter (HQ) employees with their current implementation of conventional methods of building maintenance management practices. An action research was applied in the study and an intervention was implemented to improve the existing traditional practice. The intervention conducted was implementing a Building Maintenance Management System (BMMS) to tackle the concerns that were faced by XYZ Bank HQ employees. Thereafter, the BMMS's effectiveness was measured and further analysed using a mixed-method research design where both quantitative and qualitative analysis were conducted in this study. A number of 35 respondents participated in this study and the data collected were evaluated using descriptive and thematic analysis. The finding showed that the BMMS implementation was effective as per rated by the respondents using Likert Scale survey questionnaire.

Keywords:
Building Maintenance Management system, computerization, building facilities, digital transformation

1. Introduction

At present, most companies in Malaysia are still implementing the conventional method rather than implementing a modern computerized system to manage the maintenance of building facilities and infrastructure [1]. The application of the conventional method is known as a paper-based report or a non-systematic computational database for facilities management. Implementation of the conventional approach provides ineffective and poorly structured maintenance management [2]. Therefore, this study explores how the existing building maintenance practices can be improved by implementing a Building Maintenance Management System (BMMS).

With the constantly evolving financial world, combined with rapid technology innovations, banks in Malaysia are moving towards the digital banking transformation which includes XYZ Bank. One of the many things to digitalize includes the building maintenance management practice.

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Currently, in XYZ Bank, building maintenance management practice is being done in the conventional method where complaints are being lodged and taken care of by using telephone, emails, and paper-based forms that need to be filled to file a complaint. Basically, all complaints and reports are being done manually, which this does not assimilate with the objective of banks to transform into digitalization.

Despite that, this current conventional practice is also unsystematic and has many flaws that caused so many issues in the department such as the delays in settling a complaint, the lost of track of the complaints received, the handling of complaints are delayed which all these and not limited to these issues, are affecting negatively to a lot of things which include the employees Key Performance Index (KPI), the bank's reputation, customer's satisfaction and so on.

Such things happened because of the traditional and manual practice that the bank is practicing is considered messy, unpractical and have many loopholes in handling it. The telephone or cell phone used for fault reports relies on the group involved in maintenance management. If one of the parties is not available, the notification of the defect cannot be made and must be reported again. In the meantime, the paper-based form requires the signature of the head of the department before being forwarded to the maintenance management team. This process would take a few days before the issue could be resolved. Complaints via email often create difficulties for the receiver due to the difficulties of receiving a message when the mailbox is occupied.

The implementation of conventional method provides ineffective and poorly organized maintenance management [3]. The conventional method must be improved for better maintenance of building and infrastructure, and to provide good environments. The technical and managerial defects are the main problems in the conventional method in maintenance management. Therefore, a Building Maintenance Management System (BMMS) is necessary to handle and manage the facilities defect and complaints of the building in a more appropriate, time saving and paperless manner.

2. Methodology

The methodology used to achieve the objective is by using a mixed-method approach. Mixed methods study is the style of research in which a researcher incorporates elements of qualitative and quantitative research approaches with a wide variety and breadth of understanding and corroboration [4].

For the first research objective, which is to determine the issues of the current building maintenance management practice, interviews and qualitative method is used to find out the comments and opinions of the employees of XYZ Bank staff. Three experienced XYZ Bank employees with different levels of positions were interviewed to investigate and understand more on the existing building maintenance management practice in the bank.

After the interview has been conducted and the issues the employees are facing were known and understood, the intervention to achieve the second research objective which is to implement the BMMS, was carefully planned and introduced to the bank.

After the implementation of the BMMS, data was collected through both quantitative and qualitative methods to get feedbacks on the intervention. For quantitative method, survey questionnaire was distributed whereas for qualitative method, again online interviews were conducted. As for the analysis of the data, for quantitative results, it was analysed using SPSS where descriptive analysis were performed. Whereas for qualitative results, Thematic Analysis was conducted to transcript the interviews done.

The data analysis is basically performed to accomplish the third research objective which is to measure the effectiveness of the intervention which is the implementation of BMMS in XYZ Bank. To find out the effectiveness of the system implemented, the data collected were analysed and the results of between having a system-based to manage maintenance issues were compared to the previous conventional practices of managing building maintenance.

3. Results

3.1 Pre-Intervention – Qualitative Research Method

To achieve the first research objective which is to determine the issues of the current building maintenance management practice. An interview was conducted and thematic analysis is used to examine the common themes of the study interview.

3.1.1 Thematic Analysis

From the three interviews conducted, seven themes have emerged and are concluded as follows. The current practice to lodge complaints on facilities issue is not convenient to the employees as complaints are being made through emails, phone calls and Whatsapp Messenger apps. Employees need to access emails to lodge on complaints. Complaints are usually about facilities issues like maintenance which includes cleanliness, and general repairs. Using emails is time consuming and unsystematic as it will be hard to track back on the issues. Tracking is done manually same goes to checking the progress of the complaint lodged. The timeline of complaints depend on the scale of complaints. Smaller scale of complaints tend to resolve faster compared to large scale of complaints. Based on the interviews and analysis conducted, it is concluded that to improve the current practice is by implementing BMMS.

3.2 BMMS as the Intervention

The implementation of the BMMS was planned. The system was implemented by an outsourcing vendor who is well-experienced in providing not just a BMMS but also the whole Facilities Management (FM) context. The implementation process starts with holding a meeting with the outsourced vendor to explain on the issues XYZ Bank is facing. Based on the issues explained, the vendor suggested few product roadmap solutions to cater the issues encountered and upon agreement from both sides, the best solution was chosen to be implemented. BMMS is a cloud-based mobile applicated that is accessible to be download via iOS and Android.

3.3 Post-Intervention – Qualitative Research Method

The same people for the pre-intervention interview were interviewed again for post intervention study to get their feedbacks on the BMMS. Thematic analysis was used to analyze it and six themes have emerged from it as per concluded below.

The implementation of BMMS received mostly positive feedbacks. Users are satisfied with the system as they feel like this new system is more convenient compared to the previous practice practiced by the bank. The system can be accessed anywhere as the application is supported by both iOS and Android users. Users can directly upload photos and videos in the application. It is definitely more systematic where users can track back all the complaints and see the progress of the complaints being lodged on. Complaints can be lodged right away, and vendors will be notified immediately. This

can reduce the time to for an issue to resolve. So far, it is still too early to detect the drawbacks of the system.

3.4.1 Reliability Test of the Survey Questionnaire

For this action research, the survey questionnaire was developed, and reliability test was done to measure the consistency of items in the questionnaire. The results of Cronbach's alpha was generated using SPSS and summarized as per below:

Reliability Statistics

Cronbach's Alpha	N of Items
0.903	8

Fig. 1. Cronbach's Alpha Reliability Statistics

3.4.2 Descriptive Analysis of the Survey Questionnaire

Table 1
Average Number of Complaints in a Week

In a week, what is the average number of complaints

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once a	9	25.7	25.7	25.7
	Twice a	9	25.7	25.7	51.4
	Three times	7	20.0	20.0	71.4
	More than three times	10	28.6	28.6	100.0
	Total	35	100.0	100.0	

Table 2
Complaints are Attended within The Desired Timeline

Complaints are attended within the timeline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly	1	2.9	2.9	2.9
	2	4	11.4	11.4	14.3
	3	6	17.1	17.1	31.4
	4	20	57.1	57.1	88.6
	Strongly	4	11.4	11.4	100.0
	Total	35	100.0	100.0	

Referring to Table 2, it is shown than more than 50%, which is equivalent to 20 respondents, voted with the rating of 4, meaning that they agree, complaints are attended within the timeline after the implementation of BMMS.

Table 3
The Efficiency of BMMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	8.6	8.6	8.6
	3	5	14.3	14.3	22.9
	4	12	34.3	34.3	57.1
	Strongly	15	42.9	42.9	100.0
	Total	35	100.0	100.0	

Looking at Table 3, 15 respondents, which is almost half of the respondents, strongly agreed with the rate of 5, that complaints are resolved faster compared to the previous practice which is before the implementation of BMMS. Followed by 12 respondents who agrees that by implementing BMMS, complaints are resolved faster as referred to the traditional manual practice that they are using previously. Summing up both ratings, it shows that more than 70% agree with the statement stated.

Table 4
The Convenience of BMMS
The system is user friendly & convenient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	4	11.4	11.4	11.4
	4	17	48.6	48.6	60.0
	Strongly	14	40.0	40.0	100.0
	Total	35	100.0	100.0	

Table 5
BMMS as a Convenient Channel
It is convenient that there is a proper channel to lodge complaints now

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	5	14.3	14.3	14.3
	4	9	25.7	25.7	40.0
	Strongly	21	60.0	60.0	100.0
	Total	35	100.0	100.0	

Almost 90% of the respondent feels that the system is user friendly and convenient. The lowest rating for this question is 3 that is consists of 11.4% from the total percentage of votes. This indicated that 4 feels neutral when using the system. Table 5 is referred. 60% of the respondents agreed that it is very convenient for the users to lodge complaints now due to there is a proper channel to lodge complaints which is BMMS application that is accessible anywhere through either iOS or Android.

Table 6
Systematic Tracking of BMMS

All reported complaints and incidents are being tracked systematically

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	3	8.6	8.6	8.6
	4	18	51.4	51.4	60.0
	Strongly	14	40.0	40.0	100.0
	Total	35	100.0	100.0	

Table 7
Checking Complaints Status

I can easily check the status of complaints that I lodged

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	3	8.6	8.6	8.6
	4	11	31.4	31.4	40.0
	Strongly	21	60.0	60.0	100.0
	Total	35	100.0	100.0	

91.4 per cent voted that they strongly agree and agree with 40 per cent and 51.4 per cent of votes respectively that the complaints are now being tracked systematically, whereas 91.4% strongly agree and agree with the number of respondents of 21 and 11 respectively that they can now track their progress of complaints easily using this new implemented BMMS.

Table 8
Overall Rating of BMMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	4	11.4	11.4	11.4
	4	14	40.0	40.0	51.4
	Excellent	17	48.6	48.6	100.0
	Total	35	100.0	100.0	

To conclude the questionnaire, we can observed that almost 90 per cent of the respondents rated the BMMS system as excellent and good with the number of per cent of 48.6 and 40 respectively. This show that users are so far satisfied with the implementation of the new system as they are rating it high.

4. Conclusions

Before the implementation of BMMS, based on the interviews conducted and thematic analysis constructed, it was found that according to the interviewees, the conventional method is unsystematic and inconvenient.

Both results of the interview and survey showed that the intervention of the implementation of BMMS is effective towards the XYZ Bank employees. All of the interviewees agree that the system

brings many advantages to the organization. The building maintenance management is more systematic and is being handled in a more productive way. BMMS helps to increase work efficiency. Ultimately, interviewees agreed that the implementation of BMMS brings benefit to the organization.

90 per cent of the respondents rated the BMMS system as excellent and good with the number of per cent of 48.6 and 40 respectively. This show that users are so far satisfied with the implementation of the new system as they are rating it high and the system is an effective intervention.

BMMS evidently reduces problems through its for managing maintenance identification, assessing, planning and execution of the building maintenance effectively in the site location. Essentially, the BMMS has the potential to transform cloud services of facilities management into one of the most sophisticated technologies in the organization.

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