

Development and Implementation of a Web-based Procurement Planning Management System

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Abstract

The paper discusses the development of a web-based procurement planning management system which aimed to make the conduct of the procurement planning process more systematic and efficient. The developed system includes the creation and consolidation of the Project Procurement Management Plan, automated generation of the Annual Procurement Plan and management, and monitoring of the procurement activities. The system enables the users a web-based creation and submission of the PPMP up to automatic consolidation of evaluated items for the preparation of the APP. The system was implemented in one of the State Universities and Colleges in the Philippines. The implementation of the said system resulted in an increase of 75%-time efficiency for the procurement planning activity. It also eliminated item duplication producing an accurate report and better monitoring of the procurement activities which resulted in greater customer satisfaction and budget management.

Keywords: *information system, planning system, procurement system, purchasing*

Introduction

Procurement is the acquisition of goods or services of an organization from suppliers at the right quantity, time, cost, and place (Jun-Wei & Lei-Jun, 2011)(de Araújo et al., 2017). For government agencies in the Philippines, the procurement activities should conform to rules set by Republic Act 9184 known as the “Government Procurement Reform Act,” which provides the modernization, standardization, and regulation of the procurement activities of all government institutions (GPPB, 2016; Official Gazette, 2016). All items to be bought by a procuring agency should be classified and be posted at the Philippine Government Electronic Procurement System (PhilGEPS) (<https://www.Philgeps.Gov.Ph/>, 2019).

Procurement planning is the first step in the procurement process. Procurement planning consists of the submission of the Project Procurement Management Plan (PPMP), which refers to the itemized list prepared by the head of each unit and offices. Afterward, there is an evaluation and consolidation of these PPMPs to the Agency Annual Procurement Plan (APP). The APP is a required document that the agency must prepare to reflect the necessary information on the entire procurement activities that the agency plans to undertake within a calendar year (DBM, 2010).

The usual practice for procuring agency is that every office/unit in that agency submits a hardcopy of their PPMP to a Procurement Unit. A committee is formed to evaluate the submitted PPMP forms and manually consolidates all evaluated items from PPMP to generate their APP using a spreadsheet. Due to numerous item requests with various descriptions and requirements, problems like duplication of items, wrong tagging of the category, non-inclusion to the consolidated APP arise. Also, the requesting office cannot monitor the items requested, whether it was approved or not, which usually leads to duplication of their request from the previous year.

An analysis of the design phase for a web-based procurement management system and completed implementation was developed to in pursuit of efficiency and effectiveness in the organization. It includes Purchase Request, Document Section Process, Supply Section Process and Billing Section Process as well as the overall management of supplier relationships to ensure continued customer service (Perera & Vidanagama, 2019)

One of the proposed model for e-procurement management system should provide framework for collaboration among sections within the organization. It should include approval of order request, inclusion

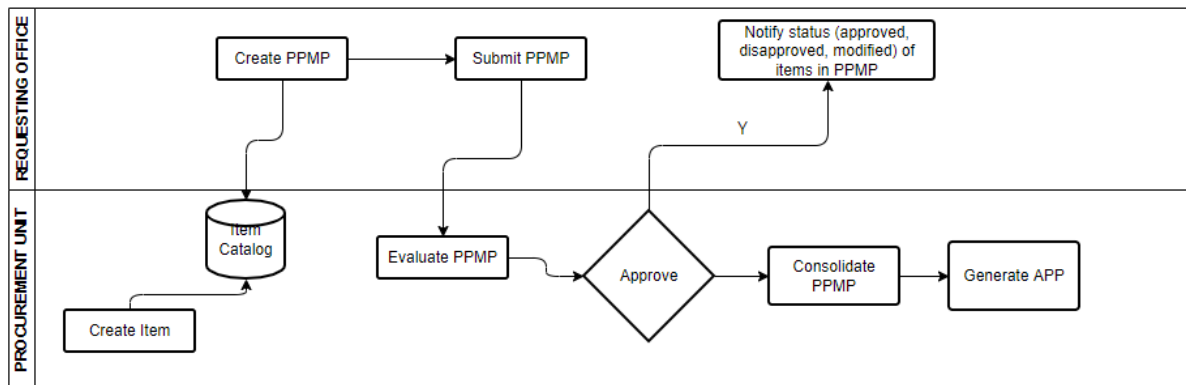


Figure 1 Flowchart of the system.

of procurement planning and contract management (Lemar, 2018). The research being presented in the paper will focus on the procurement planning phase.

The development of a web-based procurement planning management system aims to help the Procurement Unit in Philippine government agencies in automating the creation and consolidation of PPMP to APP for proper evaluation and monitoring. Many organizations have already used information systems to shift their processes from manual to computerized process (Alkhalifah & Ansari, 2016; Bomfim et al., 2014; Fong & Yan, 2009; Relucio & Dela Cruz, 2020).

Likewise, the procurement planning management system will also ease the preparation of the documents and forms needed for government procurement. The use of information systems, especially for developing countries (Ndou, 2017), has proven to have improved not only business activity but also process efficiency (Zhao et al., 2015). The development of such system will help an organization reduce the amount of paperwork generated from the traditional method (Relucio & Dela Cruz, 2020)(Relucio, 2020)(Adebayo & Evans, 2015).

The research can be used as a benchmark for other government agencies in the Philippines for automating their procurement planning process.

Materials and Methods

Analysis

The flowchart of the Procurement Management System is shown above.

For the requesting office to create the PPMP, items requested should be created and stored in the Item Catalog which is maintained by the Procurement Unit, making it easier for the searching and selection of items.

All PPMPs submitted by the offices are then evaluated by the committee. The evaluation process includes approving individual line-item request, disapproving line-item request and also modifying the quantity being requested. After the evaluation, requesting office are notified of the status of the items they requested. When the PPMP of all requesting offices are evaluated, the system automatically summarized consolidates and generates all the items which becomes the APP of the agency.

Design

The study used Development design to undertake the study. The study used Waterfall Development Methodology which is a linear model and is very simple to implement (Saxena & Upadhyay, 2016). It includes system, requirements, initial and detailed design, implementation, testing, operations, and maintenance. Waterfall methodology is suitable for small software project (Saeed et al., 2019).

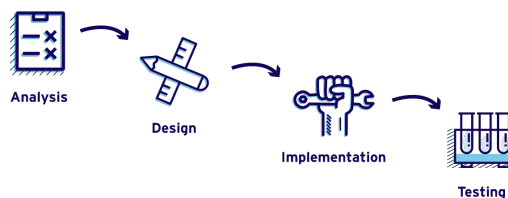


Figure 2 Waterfall Development Methodology

During the development part, the researcher used the following software requirements: Visual Studio 2015, ASP.Net C# for front-end, Blazor Framework, ASP Net Core for back-end, CSHTML, SQL Server 2016 for database, and Crystal Report 13 for report generation.

Use-Case Design

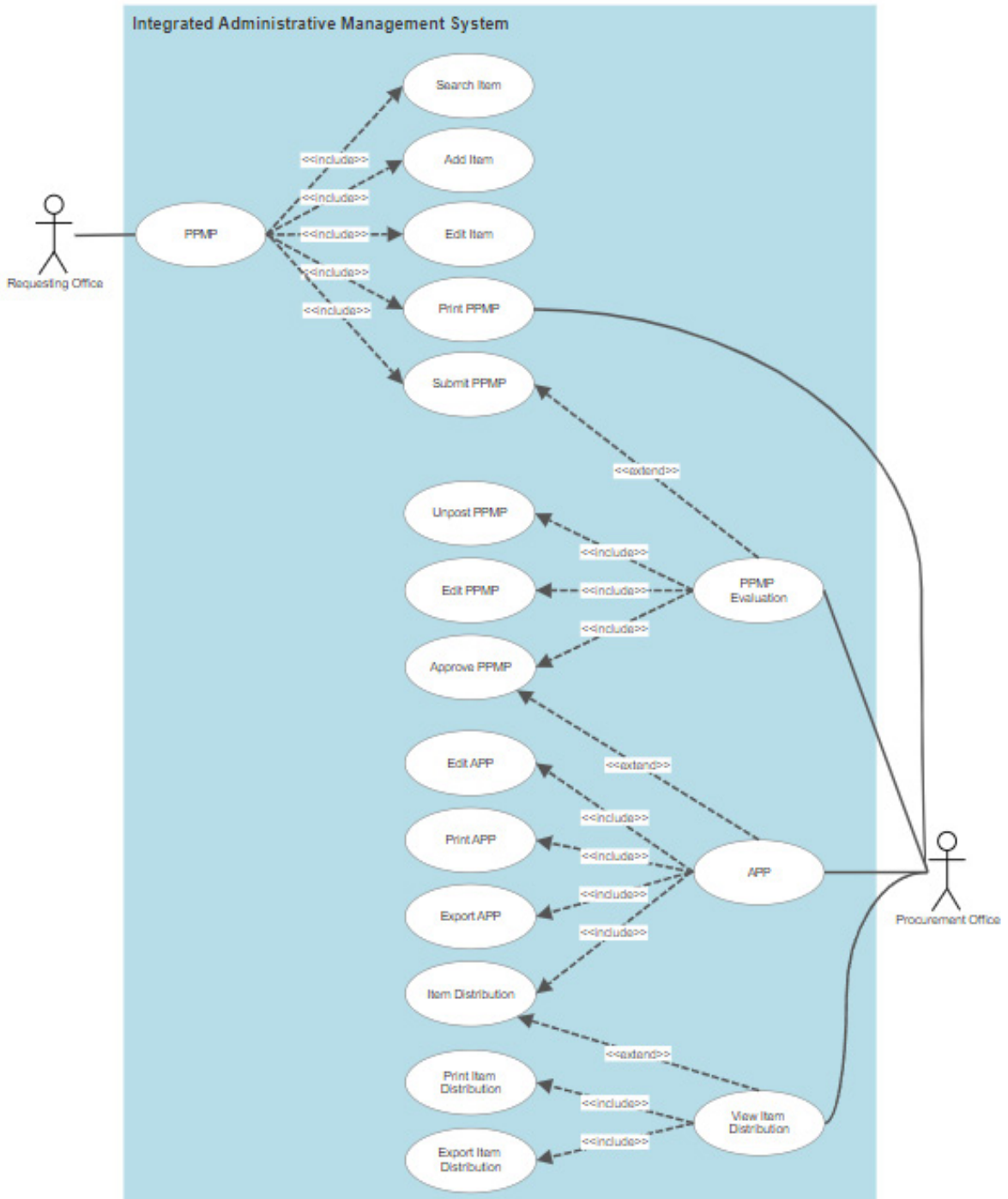


Figure 3 Use-case Diagram of User Requirement

Entity Relationship Diagram

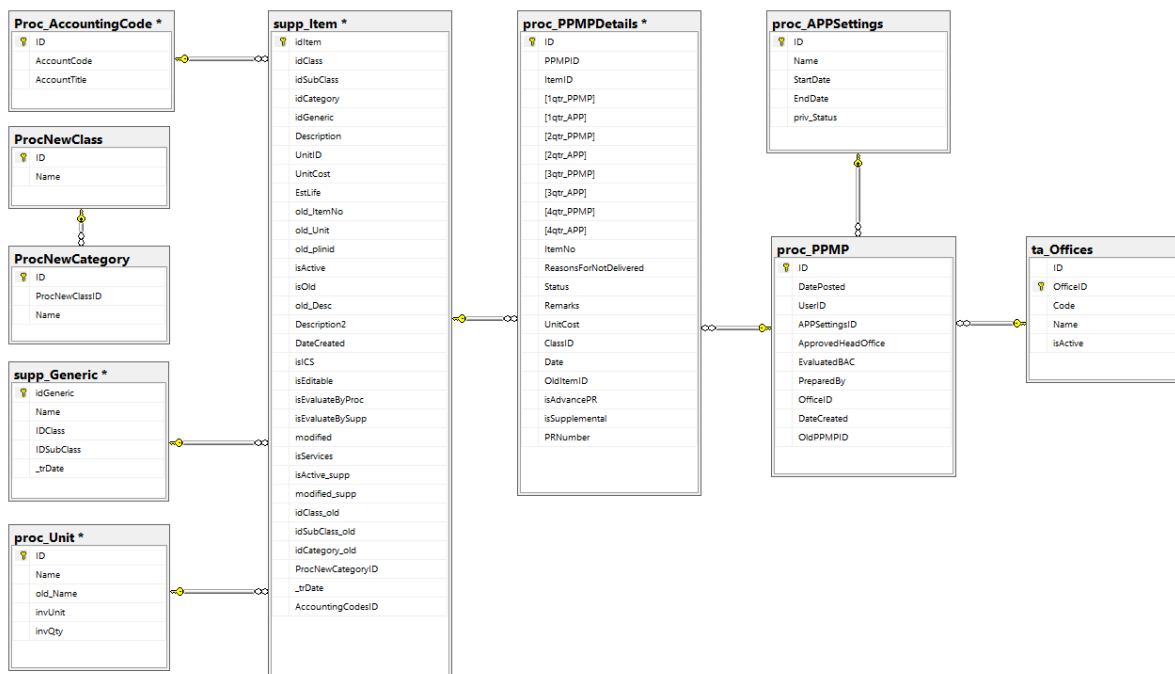


Figure 4 Entity-Relationship of the System

The use-case diagram shown in Figure 3 and ER Diagram in Figure 4 show the process of how the requesting office and Procurement unit interact with the developed application. The developed web-based procurement planning management system allows searching of item, adding item to PPMP, submission and approval of PPMP and printing and exporting of APP which also includes information on item distribution.

Implementation

The developed Procurement Management System was implemented and tested at Tarlac State University (TSU) (Tarlac State University, 2022), one of the State Universities and Colleges (SUCs) in the Philippines, which envisions to be a premier University in the Asia-Pacific region.

Evaluation

The system was evaluated by the 15 end-users using the ISO (international Standard Organization) 9126 software evaluation questionnaire which provides a generic definition of software quality based on functionality, efficiency, reliability, and usability (Budiman et al., 2018)(Corvera et al., 2020).

To determine that the system was able to satisfy the requirements, the following scale also known as Likert's Scale was used by IT experts and end users in rating the system. Pilot testing and trial runs was conducted to let the respondents in rating the system

Table 1 Likert's Scale

Mean Value	Weight	Verbal Interpretation
4.51 – 5.00	5	Outstanding
3.51 – 4.50	4	Very Satisfactory
2.51 – 3.50	3	Satisfactory
1.51 – 2.50	2	Good
1.00 – 1.50	1	Poor

Results and Discussion

The Procurement system can be easily accessed by the users simply by using a web-browser. The major module in the system includes PPMP Creation and Evaluation and Consolidation of PPMP to APP.

Creation and Evaluation of Procurement

Back
/ ppmp details

PPMP DETAILS

Item Description

Item :

Technical Specifications:

Class :

Category :

UOM :

Price :

1st qtr. :

2nd qtr. :

3rd qtr. :

4th qtr. :

Save
Clear

ANNUAL PROCUREMENT PLAN (APP) 2023 / Total Items : 54 / [Print Preview](#)

Category Name	Description	Unit	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	Unit Cost	Total Cost	
Hardware Supplies and Materials	CABLE TIE, Nylon, Black 150mm x 3.6mm 100pcs/bag	bag	0	50	0	0	50	202.00	10,100.00	
	CABLE TIE, Nylon, Black 250mm x 3.6mm 100pcs/bag	bag	0	50	0	0	50	452.00	22,600.00	
	CABLE TIE, Nylon, Black 300mm x 3.6mm 100pcs/bag	bag	0	50	0	0	50	492.00	24,600.00	
IT Consumables	CMOS BATTERY, CR2032 3V CMOS Battery	unit	0	20	0	0	20	50.00	1,000.00	
	INK BOTTLE, Genuine EPSON 008, Black for Epson L15150	bottle(s)	0	3	0	0	3	860.00	2,580.00	
	INK BOTTLE, Genuine EPSON 008, Cyan, for Epson L15150	bottle(s)	0	2	0	0	2	860.00	1,720.00	
	INK BOTTLE, Genuine EPSON 008, Magenta, for Epson L15150	bottle(s)	0	2	0	0	2	860.00	1,720.00	
	INK BOTTLE, Genuine EPSON 008, Yellow, for Epson L15150	bottle(s)	0	2	0	0	2	860.00	1,720.00	

Date Posted : 3/11/2022 (This record is now for evaluation.)

Figure 5 Creation of PPMP

PS-Common Use Supplies	MARKER, permanent, bullet type red, 12 pieces/box	piece(s)	4	0	0	0	4	9.65	38.60		●	
	MARKER, whiteboard, bullet type red, 12 pieces/box	piece(s)	4	0	0	0	4	10.31	41.24		●	
	MARKING PEN, whiteboard, black	piece(s)	8	0	0	0	8	25.00	200.00		●	
	PAPER CLIP, gem type, 32mm, 100 pieces per box or 52 grams (min.) (net of box) 50 boxes/carton	box	6	0	0	0	6	5.98	35.88		●	
	PAPER CLIP, gem type, 48mm, 100 pieces per box or 120 grams (min.) (net of box) 50 boxes/carton	box	6	0	0	0	6	12.74	76.44		●	
	PAPER, Multi-Purpose A4, 70gsm, 5 reams/box	ream(s)	6	0	0	0	6	104.16	624.96		●	
	PAPER, Multi-Purpose Legal, 70 gsm, 5 reams/box	ream(s)	24	0	0	0	24	118.35	2,840.40		●	
	PUNCHER, heavy duty	piece(s)	2	0	0	0	2	131.96	263.92		●	
	STAMP PAD, Ink, 50ml, (min.) 12 bottles/box	bottle(s)	1	0	0	0	1	24.63	24.63		●	
	STAPLE WIRE, standard 100 boxes/carton	box	4	0	0	0	4	20.68	82.72		●	
	TAPE, masking, 24mm, width: 24mm, 12 rolls/pack	roll	2	0	0	0	2	55.12	110.24		●	
	TAPE, masking, 48mm, width: 48mm, 6 rolls/pack	roll	2	0	0	0	2	106.60	213.20		●	
TAPE, transparent, 24mm, width: 24mm, 6 rolls/pack	roll	4	0	0	0	4	9.10	36.40		●		
TAPE, transparent, 48mm, width: 48mm, 6 rolls/pack	roll	2	0	0	0	2	18.20	36.40		●		
Services	Accommodation	SEMINARS, vpaa, planning	lot	0	0	1	0	1	200000.00	200,000.00		●
	MEETING	CATERING, Academic Council Meeting (4 meetings)	pack	344	0	344	0	688	400.00	68,800.00	-	●
		CATERING, Meals for meetings (Council of Deans and Academic Directors, FSB, Committee Meetings, Emergency Meetings)	pack	300	0	300	0	600	400.00	60,000.00	-	●

Legend : ● = Approved ● = Disapproved ● = Pending

Figure 6 Evaluated PPMP of an office

For requesting items, supplies, materials, and equipment for the PPMP, the college/office only needs to search for these items and identify the quantity needed per quarter as shown in Fig. 4. Since items are stored in item management, the users no longer need to worry about the technical specification and price. The item management is used for the creation of items needed by offices for their PPMP. If the item is not available on the list, the requesting officer needs to inform the Procurement Unit so that the item will be included in the item list. Item management eliminated duplication of items because each item has its item id. The created PPMP will now be submitted for evaluation. The system will indicate when the request was posted and the status will show that it is now for evaluation.

After the committee evaluated the PPMP requests, the requesting user can already identify which requests were approved or disapproved. This feature will allow requesting office to monitor their PPMP and can be a basis in the creation of the PPMP for the succeeding year. A sample evaluated and approved PPMP of the requesting office is shown in Fig. 6. The system automatically sums up the total amount of items in the evaluated and approved PPMP.

Generation of the Annual Procurement Plan

After the evaluation of all PPMP submitted by colleges and offices, the procurement unit needs to set the APP settings. Once it is set, system will notify, as shown in Figure 7, the Procurement Unit the total number of PPMP records included in the APP.



Figure 7 System Notification

Printing can be in .pdf format or can be exported in Excel. Item distribution shows the requesting office of the item to be purchased. Options for viewing the APP can be for the whole agency as shown in Figure 8, by category as shown in Figure 9, by quarter as shown in Figure 10 and by item distribution as shown in Figure 11.

ANNUAL PROCUREMENT PLAN (APP) FOR 2021 For Common-Use Supplies and Equipment

ITEM AND SPECIFICATION	UNIT OF MEASURE	Quantity Requirement				TOTAL	UNIT COST	TOTAL COST
		1st QTR	2nd QTR	3rd QTR	4th QTR			
B. OTHER ITEMS NOT AVAILABLE AT PS BUT REGULARLY PURCHASED FROM OTHER SOURCES								
Consulting Services								
Surveillance Audit								
IMS, Re-Certification Audit for ISO 9001 : 2015 (Quality Management System)	lot	1	-	-	-	1	1,000,000.00	1,000,000.00
Sub Total :		1,000,000.00	0.00	0.00	0.00			
Goods								
Accreditation								
KIT, ballpen, black	piece(s)	30	-	30	-	60	10.00	600.00
KIT, pencil, lead with eraser (12 pcs/box)	box	5	-	5	-	10	200.00	2,000.00
KIT, pin, dressmakers,	box	50	-	-	-	50	15.00	750.00
KIT, pocket calculator, 8 digits	piece(s)	30	-	30	-	60	500.00	30,000.00
KIT, staple wire, size 10	box	30	-	-	-	30	10.00	300.00
KIT, stapler, size 10	piece(s)	30	-	-	-	30	75.00	2,250.00
KIT, yellow pad paper	pad	10	-	10	-	20	35.00	700.00
NAME PLATE, for table, crystal clear acrylic (transparent), size: 12L x 4H inch.	piece(s)	15	-	10	-	25	1,000.00	25,000.00
Sub Total :		34,950.00	0.00	26,650.00	0.00			
Audio and Visual Equipment								
LAPTEL, Portable, USB0 2.0 Interface, MP3 Music Play mode, radio function *specs to follow*	unit	3	-	-	-	3	6,500.00	19,500.00
SPEAKER, Portable Speaker Trolley (Frequency response:50Hz-20Hz, S/N Ratio:71dB, Led Lights, Guitar Input, Wired Mic Input, 500W Portable Sound System with 2 Handheld Wireless Mic, remote control, FM, USB, Bluetooth, Rechargeable Battery)	piece	-	-	1	-	1	10,000.00	10,000.00
Sub Total :		19,500.00	0.00	10,000.00	0.00			
AUDIO AND VISUAL EQUIPMENT-CASS								
BROADCAST TELEPROMPTER, 19" Range of visibility more than 3 meters professional LCD Software included	unit	1	-	-	-	1	100,000.00	100,000.00
CCTV RECORDER, NVR CCTV Recorder, 16 channels, V.25	unit	1	-	-	-	1	25,000.00	25,000.00
DVD PLAYER, Home entertainment system, Blu-Ray, 5.1 ch, 100W, Full HD, HDMI, USB, with satellite speakers	unit	1	-	-	-	1	16,000.00	16,000.00
LIGHT STAND, Impact Heavy duty light stand threaded top, 4 sections, air-cushioned, 5/8" stud with 1/4"-20	piece	4	-	-	-	4	3,000.00	12,000.00
MICROPHONE, Professional Diaphragm condenser microphone with anglepoise microphone arms with table clamps, Smts cables and XLR M/F connectors	piece	2	-	-	-	2	75,000.00	150,000.00
MICROPHONE, Stereo Video Condenser Microphone, unidirectional 200 ohms 76dB	piece	2	-	-	-	2	3,500.00	7,000.00
MONITOR TROLLEY, 32"-60" LCD/plasma/LED	piece	2	-	-	-	2	25,000.00	50,000.00
MULTIMETER, Electricians Digital Multimeter, 110 series, 6000 count, True RMS, Auto, Manual Range, 3.5 Digits	unit	2	-	-	-	2	18,000.00	36,000.00
NETWORK CAMERA, 2MP IR Cube Network Camera (Specs to follow)	piece	16	-	-	-	16	3,500.00	56,000.00
RECORDER, Handy mobile 4-Track recorder -X/Y Mic design _4 Channels - High resolution, 24-bit/96 khz linear PCM recording	unit	1	-	-	-	1	22,000.00	22,000.00

This is a system generated report (IMS) © MISO

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Figure 8 Sample APP report

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Consulting Services				
Surveillance Audit	1,000,000.00	0.00	0.00	0.00
Subtotal:	1,000,000.00	0.00	0.00	0.00
Goods				
Accreditation	34,950.00	0.00	26,650.00	0.00
Audio and Visual Equipment	19,500.00	0.00	10,000.00	0.00
AUDIO AND VISUAL EQUIPMENT-CASS	1,760,000.00	0.00	0.00	0.00
Automotive Supplies	1,300.00	0.00	0.00	0.00
Automotive Supplies - Motorpool	215,400.00	0.00	165,000.00	0.00
AWARDS	280,720.00	0.00	1,471,000.00	0.00
BC-Direct Printing Consumables	859,000.00	0.00	774,000.00	0.00
BC-Garments	8,700,000.00	0.00	0.00	0.00
BC-General Merchandise	6,163,500.00	400,000.00	400,000.00	400,000.00
BC-Office Equipment	50,000.00	0.00	0.00	0.00
BC-Office Supplies	1,400,912.00	0.00	950,642.20	0.00
BC-Packaging Materials	65,775.00	0.00	0.00	0.00
BC-Printing Consumables	643,950.00	0.00	557,350.00	0.00
BC-Tailoring	21,000.00	0.00	0.00	0.00
BC-Tarpaulin Spare Parts	313,700.00	0.00	305,400.00	0.00
Books	10,000,000.00	0.00	0.00	0.00
Common Office Supplies	191,682.40	0.00	1,045.00	0.00
Communications - Motorpool	55,000.00	0.00	0.00	0.00
Direct - Accountable Form	10,500.00	0.00	5,250.00	0.00
Direct - Check booklet	49,249.50	0.00	0.00	0.00
Direct - Copier Consumables	4,069,141.00	0.00	863,110.00	0.00
Direct - Copier Spare parts	2,546,914.80	0.00	400,000.00	0.00
Direct - Fuels, Additives and Lubricants	2,400,000.00	0.00	0.00	0.00
Direct - Official Receipt	676,000.00	0.00	676,000.00	0.00
Direct-Toll Fee	1,200,000.00	0.00	0.00	0.00
FIRE FIGHTING	40,500.00	0.00	0.00	0.00
Food Laboratory Tools, Supplies and Materials (15,000.00 and below)	209,250.00	0.00	2,500.00	0.00
Furniture & Fixtures	15,000.00	0.00	0.00	0.00
Grocery Items	73,658.00	0.00	79,508.00	0.00

Figure 9 APP report by category

Figure 8 is a sample APP report that shows the agency's total Annual Procurement Plan. The report shows all the items consolidated from the evaluated and approved PPMP. The last page contains the total cost needed by the Agency to purchase all request items.

Figure 9 shows the generated APP by category. Items are categorized and show quantity request by quarter.

Figure 10 shows an option for showing the APP report by funds to be used, by quarter and by classification. This can give an option to Procurement Unit to create a Purchase Request for items.

Figure 11 shows the item distribution of the APP. The report will show the requesting office per item. The report can be used by the supply and property management unit in identifying accountable officer to

receive items when they are already delivered to the agency.

Evaluation of the System

The procurement planning management system obtained an Outstanding rating from the users because the system was able to perform the tasks and objectives with precision and was able to meet the needs of the user. Through the system, users were able to create and submit PPMP online, and the procurement unit was able to submit the APP on time. The manual consolidation takes them a month to finish, whereas, through this system, it only takes a few minutes and days to finalize and generate the APP. Also, users mentioned that the system is effective since it is easy to learn, is error-free, eliminated double entry and is accessible online.

Classification	Category Name	Description	Unit of Measure	1st Qtr	Unit Price	Tag Items	Advance PR	Edit Item
	AUDIO AND VISUAL EQUIPMENT-CASS	BROADCAST TELEPROMPTER, 19" Range of visibility more than 3 meters professional LCD Software included	unit	1	100,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	CCTV RECORDER, NVR CCTV Recorder, 16 channels, V25	unit	1	25,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	DVD PLAYER, Home entertainment system, Blu-Ray, 5.1 ch, 100W, Full HD, HDMI, USB, with satellite speakers	unit	1	16,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	LIGHT STAND, Impact Heavy duty light stand threaded top, 4 sections, air-cushioned, 5/8" stud with 1/4" 20	piece	4	3,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	MICROPHONE, Professional Diaphragm condenser microphone with anglepoise microphone arms with table clamps, 5mtrs cables and XLR MF connectors	piece	2	75,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	MICROPHONE, Stereo Video Condenser Microphone, unidirectional 200 ohms 76dB	piece	2	3,500.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	MONITOR TROLLEY, 32"-60" LCDipasmALED	piece	2	25,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	MULTIMETER, Electricians Digital Multimeter, 110 series, 6000 count, True RMS, Auto, Manual Range, 3.5 Digits	unit	2	18,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	NETWORK CAMERA, 2MP IR Cube Network Camera (Specs to follow)	piece	16	3,500.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
	AUDIO AND VISUAL EQUIPMENT-CASS	RECORDER, Handy mobile 4-Track recorder -XY Mic design _4 Channels - High resolution, 24-bit/96 khz linear PCM recording	unit	1	22,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select
Goods	AUDIO AND VISUAL EQUIPMENT-CASS	SOUND SYSTEM, 12" Two-way Full Range Main System, 12" Two-way Bass-Reflex, 1500 watts, Pole stand, 2 x 12" Two-way Full Range Main System, Floor Monitor, 12" Two-way Bass reflex, 1500 watts, 2 x 15" active Subwoofer, CSC Touchscreen, 16 Capacitive Touchscreen, Anti-Feed, Real time analyzer, 10 AUX mixers, 22-channel direct to Hard Drive record, MP3 playback direct from USB, with Dynamic Cardiod Vocal Microphone, Dynamic T10 Single wireless microphone, range up to 120 meters; Male XLR (30 X190.00) Female XLR (30 X.210)	lot	1	750,000.00	B. OTHER ITEMS NOT AWA	<input type="checkbox"/>	Select

Figure 10 APP report by funds and quarter

ACETATE, transparent, 50meters per roll	50	600.00	30,000.00	30	Library Management and Services
				20	College of Arts and Social Sciences
				6	College of Arts and Social Sciences
				20	College of Computer Studies
				4	Civil Security Unit
BATTERY, dry cell, AA, 1.5volts, 2pcs/pack	89	36.30	3,230.70	3	Administrative Services Unit
				2	University Research Office
				50	Facilities Development and Management Office
				4	School of Law
				4	School of Law
				50	Facilities Development and Management Office
				2	University Research Office
				2	Extension Services Management Office
BATTERY, dry cell, AAA, 1.5volts, 2pcs/pack	98	19.73	1,933.54	1	Cashiering Unit
				6	Civil Security Unit
				10	College of Engineering and Technology
				20	College of Computer Studies

Figure 11 Item distribution

Table 1 Users Evaluation

Criteria	Mean	Verbal Interpretation
Functional Sustainability	4.67	Outstanding
Performance Efficiency	4.78	Outstanding
Usability	4.72	Outstanding
Reliability	4.75	Outstanding
Total Mean	4.73	Outstanding

Impact of the implementation

The Procurement Unit is the office responsible for the submission of the Annual Procurement Plan of an agency. Prior to implementation of the system,

it usually takes 20 days for offices to submit the PPMP since it takes time to manually look and search for specification of items. The committee takes 14 days to evaluate all the submitted PPMP. When all PPMP are evaluated, it takes another 30 mandays to generate the APP since the procurement staff encode the items individually in a spreadsheet and they verify the correctness based on the submitted document.

The mandays for the PPMP preparation and submission was reduced since the system has already searchable items and item specifications that offices can view. The item management eliminated duplication of items during the manual process. Since there are no duplicated items, the system provided accuracy in budget preparation because of the correct quantity of items and the corresponding amount.

The use of the Procurement Planning Management System in preparing the APP of the agency shows that there is an increase in time efficiency by 75%. When the developed system was implemented in 2017, it only took 22 mandays to prepare and generate the APP since the system automatically updates the items that were evaluated and approved for procurement.

Table 2 Total Mandays in Procurement Activities

Activity	Before implementation	After Implementation
PPMP preparation and submission	20	8
PPMP evaluation	14	8
APP generation	30	4
Total mandays	88	22

Conclusion

The paper presented the procurement planning management system developed for a State University in the Philippines that allowed requesting offices of an organization for web-based creation and submission their procurement plan. The Procurement Management System can consolidate the procurement plans to the annual procurement plan for the government agency. Users of the system evaluated the system as Outstanding since they were able to monitor the status of the procurement requests. The implementation of such system in the University resulted in an increase in time efficiency by 75% and eliminated duplication, therefore, producing an accurate report for better procurement management and stakeholder satisfaction.

For future use, the Procurement Management System can be scaled up to integrate the supply and property management activities, such as issuance, inventory, and disposal of procured items.

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