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Design and development of banana fiber decorticator with wringer (Article)

Tenerife, P.M., Jr. De La Cruz, A.R. Arce, A.C.M. Pabularan, M.A.N. Ortega, K.M.D. Rafallo, R.L.R.

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Abstract

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The demand for fiber as raw materials to make various products is increasing. It can be extracted from the seed, leaves, fruits and stem of a plant. Banana is one of the leading fruits grown in the Philippines. It provides food and a source of industrial raw materials. Aside from the fruit, banana blossom and its trunk pith that can be eaten, natural fiber can be extracted in the trunk (pseudo-stem) that is usually thrown as waste after the harvest season. The study aims to develop a machine that can extract fiber in a pseudo-stem which can be used in handicrafts, ropes, clothing and other products. A prototype was designed, developed and was tested for banana trunk fiber extraction. During the extraction process, the stem which is 45.72 cm in length and 1 cm thickness is fed manually in the prototype machine. Fiber is extracted from the pseudo-stem using a decortication process where a roller with scratched surface is compressed into a stationary bar that will crushed and scraped the trunk. During the decortication process the banana stem is also undergoing the wringing process wherein the fiber loses its water content. The extracted fiber is already dried and can be used in making domestic products. However, to have a good quality fiber, after the process, it should be washed and dried. Results indicated that the recovery rate of the banana fiber has increase by 2-3% in an average of 35.5 cm pseudo-stem. The device has a great potential and should be used for the growing fiber industry in the country. © BEIESP

Author keywords

Bast fiber | Decortication process | Pseudo stem | Wringing process

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Optical Character Reader of a Braille Unicode System for the Blind

Arvin R. De La Cruz, Reginald D. Legaspi, Zildjian L. Mergilla, Marc Oliver P. Otawa

ABSTRACT— This study aspires to innovate braille system by applying the fast coping technological advancement of the world to it. Braille is a code – a system of dots that represents the letters of the alphabet and that visually impaired individuals can use to read independently. As Braille Technology is fast growing, more and more people with visual impairment cannot afford to bought one. Thus, the proponents created a prototype, a portable and a lot cheaper braille device that will help individuals and institutions for their reading challenges. The proponents created a braille display that comes up with a scanner that will scan physical text documents then process it to become an output as a braille cell. It also comes up with a text-to-speech conversion which will become an option for the involved person on what will he or she chooses as an output. This is made possible by Optical Character Recognition (OCR) technology that the proponents used in Raspberry PI. The OCR is responsible for the image processing that will convert the image captured into a text file. The text file will then be processed again to send signal to the servo motor that is responsible for pushing the braille cells needed. The device also includes motor guide for correct scanning of the physical text documents. The device will perform the task quickly that will surely help visually impaired individuals to easily read reading materials. This system is conducted to provide another solution on problems about reading for blind and visually impaired individuals and to provide cheaper device for them. It will contribute not only to the community involved but also in the technological industry in the Philippines.

Index Terms— braille, optical character recognition, raspberry pi, Braille, Unicode System, Optical Character Reader.

I. INTRODUCTION

Reading is always a challenge for the blind and the visually impaired where they only rely on special books and items that are limited in terms of availability and effectiveness. The blind and visually impaired does not only struggle to read books, articles, or any published materials, physically written papers and signage are just few of those that have little to no use for the blind and visually impaired to use. Their touch is the most important factor for them to read and interact with their surroundings which is why people started to invent electronic devices and applications which communicate with computers and phones in order to provide and help them in using computers and phones, although it is a solution for them to communicate it is only for digital or non-physical means only, this means they are left behind when it comes to physically written, printed or displayed words. Refreshable braille displays are currently available on the market this day. These displays are mostly used in computers to output a text, which means it is only limited to display computerized text. The braille system uses six dots to represent a certain character. Therefore, there will be two (the possible states of the dots, on/off) raise to the power of six (the number of dots) combinations which is equivalent to 64. Therefore, a braille system with 6 dots is capable of displaying 64 different characters. Optical Character Recognition is a technology that is widely used nowadays in various fields. Optical Character Recognition, or OCR, is a technology that enables you to convert different types of documents, such as scanned paper documents, PDF files or images captured by a digital camera into editable and searchable data.

The proponents would like to use this technology to develop a system that will be able to recognize texts from the outside world, and project those texts using a braille display. Blind and visually impaired individual needs to have a proper education just like us. But in our current society, they are rapidly left behind by the rapid growth of education system. Admit it or not, people with disability, especially blind individual can't cope on a normal education system that we have today. It is not because of their thinking capability, it is because it's hard for them to use and apply materials that students use on schools, especially in reading. Maybe there are some who can overcome that obstacle with the help of available Braille devices in the market but, there are many also who are left behind. So the big question is was it enough given that there are many children who are in need of a device that will help them to study? As a solution to that, the proponents want to develop an Optical Character Reader of a Braille Unicode System for the Blind to help them easily read printed materials that will become the first step in making their study patterns easy. It will also serve as the first step in the development of technology in the field of Braille devices and hopefully, the time will come that there are no more visually impaired individual that will be left behind in this society where disability is a disease and education is most important.

II. METHODOLOGY

A. Method of Research

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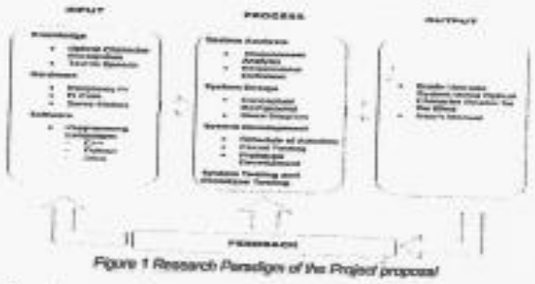

Figure 1 Research Paradigm of the Project proposal

To improve human conditions of visually impaired persons, the proponents used applied and developmental research. As an applied and developmental research study, it focuses to solve practical problems that will improve human conditions rather than to acquire knowledge. It focuses on analysis and solving social and real-life problems and generally conducted on a large-scale basis. It uses some part of the research communities' accumulated theories, knowledge, and methods. It is used to find solutions to everyday problems, and develop innovative technologies, rather than to acquire knowledge for knowledge's sake. Once an applied research has identified a workable solution to a specific problem the focus shifts to development of a specific product that involves refining the solution to produce a substance that will be effective, safe and appealing and can be manufactured in a timely and cost-effective way.

B. Data Gathering Procedure

Permission to conduct the research will be secured by the proponents from the administrator of the ATRIEV where questionnaires will be distributed to the chosen sample of the institution. The questionnaire will be scored, tallied and tabulated. The proponents and instructors of the institution will guide the persons involved for answering the given questionnaires.

III. RESULTS AND DISCUSSION

a. Functionality testing for Optical Character Recognition

Functional by Testing	First Testing	Second Testing	Third Testing	Fourth Testing
• OCR using Raspberry Pi and Pi Cam	Approximate image to text conversion accuracy is 20%	Approximate image to text conversion accuracy is 50%	Approximate image to text conversion accuracy is 60%	Approximate image to text conversion accuracy is 75%
	Fifth Testing	Sixth Testing	Seventh Testing	Final Testing
	Approximate converted image accuracy is 55%	Approximate image to text conversion accuracy is 70%	Approximate image to text conversion accuracy is 88%	Approximate image to text conversion accuracy is 90%

Table I shows the functionality of the OCR with a total of 8 testing done. The results are approximately computed based on the factors that are used during the testing period.

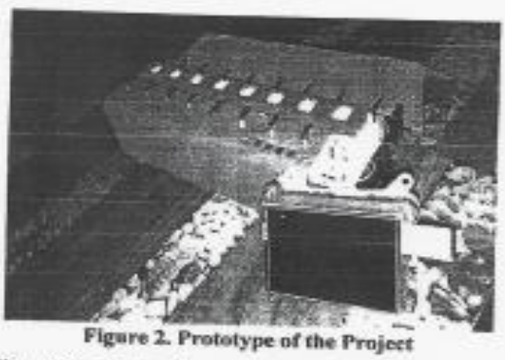

Figure 2. Prototype of the Project

Figure 2 shows the prototype of the project that showcases the braille system and the OCR and Camera that will store all the scanned documents. The device uses an 8 megapixels Raspberry Pi Cam that is installed to the Raspberry Pi, this makes it possible for the user to scan physical texts from documents or printed materials, then it will be processed by the Raspberry Pi. The scanned image undergoes Optical Character Recognition whereas the output is a text file containing all the converted data from the image. The Raspberry Pi then reads this text file and converts it to Braille ASCII, this text file is also read by the Raspberry Pi as an output for the text-to-speech

The Raspberry Pi checks the position of every cell of the braille by reading data from the rotary encoders which are attached to the servo motors on each cell, this position is used to determine the rotation needed for the servo motors to rotate to the correct position. The Raspberry Pi will send signals to the PWM Servo driver to rotate the servo motors for the desired angle. A wheel with magnets lined on its outside wall is driven by these servo motors along with the rotary angle sensors, these magnets attract and repel the pistons that serves as the individual dots. A rumble motor then vibrates to provide a haptic feedback to as the user navigates through the device.

As a feedback and error checking the rotary angle sensors are read again to ensure that the correct position is obtained, the rotary angle sensors are connected to a multiplexer that is then connected to the Raspberry Pi.

b. Weighted Mean (WM) and Verbal Interpretation (VI) of Students, Staffs, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Accuracy

Accuracy	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Correct characters are displayed	3.60	G	3.70	G	4.00	G	3.80	G
Converted text is complete	3.60	G	3.80	G	4.00	G	3.77	G
Words/texts are easy to understand	4.00	G	4.10	G	4.00	G	4.03	G
Overall Mean	3.77	G	3.77	G	3.66	G	3.84	G

Legend: Good(G)

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Table 2 shows the respondents result of the assessment. It shows the results of the developed device based on its functionality. Accuracy table shows the evaluation of the "Correct characters are displayed" with the WM of 3.50 for Students which is Good, a WM of 3.70 for the Staffs which is Good and WM of 4.20 for IT Practitioners which is Good too. "Converted text is complete" has a 3.60 WM for students and 3.50 WM for the Staffs and 4.20 WM for IT Practitioners which are both Good. "Words/Words are easy to understand has both 4.20 WM for the Students, 4.10 for Staffs, and 4.50 for IT Practitioners which indicates Good verbal interpretation. This implies that the developed device meets the functionality specification and requirements of the respondents in terms of different criteria made to be said that the device is functional.

c. Weighted Mean (WM) and Verbal Interpretation (VI) of Students and Staffs of ATRIEV, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Efficiency

Efficiency	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
How long the device will last on a daily usage	3.90	G	4.00	G	4.10	G	4.00	G
Characters that the device can output at a time	3.80	G	3.80	G	3.80	G	3.80	G
Overall Mean	3.85	G	3.90	G	3.95	G	3.90	G

Legend: Good(G),

Table 3 shows the evaluation of the respondents which are Students and Staffs on Optical Character Reader of a Braille Unicode System for the Blind on the criteria of the Efficiency. It is evaluated using two (2) criteria to assess if the device can efficiently be used by the users specifically the life span of the device and the output rate of it. Efficiency evaluation table shows in terms of how long the device will last on daily basis usage, achieve a 3.90 WM with a VI of Good and 4.00 WM with a VI of Good for the staffs and a WM of 4.10 for IT Practitioners which indicates Good interpretation. Measuring the characters that the device can output at a time produced a WM of 3.80 for both Students and Staffs and IT Practitioners that indicates a Good interpretation.

This implies that students, staffs and the IT Practitioners agreed that the developed device is appropriate to use, effective and efficient based on their needs in their everyday routine and activities.

d. Weighted Mean (WM) and Verbal Interpretation (VI) of Students and Staffs of ATRIEV, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Portability

Portability	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Weight of the device	3.90	G	3.70	G	4.10	G	3.90	F
Overall size of the device	4.60	G	3.30	F	3.70	G	4.10	G
Overall Mean	4.25	G	3.50	G	3.90	G	3.70	G

Legend: Good(G), Fair(F)

Table 4 shows the evaluation of the respondents to Optical Character Reader of a Braille Unicode System for the Blind on the criteria of portability. Portability table shows that the device meets the needs for portability as the weight of the device scores a 3.90 WM that has a Verbal Interpretation of Good for students, a WM of 3.70 that indicates Good interpretation for the staffs and a WM of 3.10 with an interpretation of Fair for the IT Practitioners. The overall size of the device produced a WM of 4.60 which is Very Good, 3.30 which is Fair and 3.70 WM which is Good for staffs, and IT practitioners respectively. Although the results are not that high the overall WM reach a Good interpretation with a WM of 3.70 so we can conclude that the device portability was met.

f. Weighted Mean (WM) and Verbal Interpretation (VI) of Students and Staffs of ATRIEV, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Cost-Effectiveness

Cost-Effectiveness	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Components Cost	4.50	VG	4.70	VG	4.60	VG	4.60	VG
Upkeep Cost	4.50	VG	4.90	VG	4.40	VG	4.60	VG
Overall Mean	4.50	VG	4.80	VG	4.50	VG	4.60	VG

Legend: Very Good(VG)

Table 5 shows the evaluation of the respondents to Optical Character Reader of a Braille Unicode System for the Blind on the criteria of portability. Cost-effectiveness table shows that the components cost got a WM of 4.50 and a verbal interpretation of Very Good for students, a WM of 4.70 which is Very Good for staffs, and a WM of 4.60 which indicates a Very Good interpretation for IT practitioners This implies that both the students, staffs and the IT practitioners agreed that the developed device is a cost-effective one. This is very important now that as technology arises, its price also gets bigger.

g. Overall Weighted Mean (WM) and Verbal Interpretation (VI) evaluation for Optical Character Reader of a Braille Unicode System for the Blind

Variables	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Accuracy	3.77	G	3.77	G	3.90	G	3.80	G
Efficiency	3.85	G	3.90	G	3.95	G	3.90	G
Portability	4.25	G	3.50	G	3.75	G	3.83	G
Cost-Effectiveness	4.50	VG	4.80	VG	4.50	VG	4.60	VG
Overall Mean	4.10	G	4.00	G	4.01	G	4.03	G

Legend: Good(G), Very Good(VG)

Table 6 shows that the overall based on the four variables got a WM of 4.10 and a verbal interpretation of Good for students, a WM of 4.00 which is Good for staffs, and a WM of 4.03 which indicates a Good interpretation for IT practitioners This implies that all the type of respondents agreed that the developed device is effective in term of the variables mentioned.

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h. ANOVA

To determine the difference among the evaluation of Students, Staffs and IT Practitioners of ATRIEVs' assessment of the Optical Character Reader of a Braille Unicode System for the Blind, the analysis of variance or ANOVA is applied. The results of the application of the test statistics will be presented, and discussed below:

Table 7 Summary of Evaluation of the Respondents

Variables	Source of Variation	Sum of Squares	df	Mean Square	F	P	Decision
Accuracy	Between Groups	0.253	2	0.126	3.316	0.052	Accepted
	Within Groups	1.013	27	0.038			
	Total	1.283	29	0.164			
Efficiency	Between Groups	0.030	2	0.015	3.5	0.026	Rejected
	Within Groups	0.045	27	0.002			
	Total	0.075	29	0.017			
Portability	Between Groups	0.350	2	0.175	6.481	0.005	Rejected
	Within Groups	0.725	27	0.027			
	Total	1.075	29	0.202			
Cost-Effectiveness	Between Groups	0.120	2	0.060	30	0.000	Rejected
	Within Groups	0.040	27	0.002			
	Total	0.160	29	0.061			

Table 7 shows that the difference in the evaluation in term of accuracy, efficiency, portability and cost-effective of the Optical Character Reader of a Braille Unicode System for the Blind

1. Accuracy

Table 7 shows that there is no difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0.052 which is greater than the 0.05 level of significance accepts the null hypothesis. The result of the non-rejection of the null hypothesis indicates the equality of evaluation among the three groups of respondents which further proves that the Optical Character Reader of a Braille Unicode System for the Blind meets the specification and requirements of the respondents in terms of Accuracy

2. Efficiency

Table 7 shows that there is a difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0.026 which is less than the 0.05 level of significance accepts the null hypothesis. The result of the rejection of the null hypothesis indicates the differences of evaluation among the three groups in terms of efficiency since the users are not knowledgeable in terms of technical operation of the device except the IT Practitioners.

3. Portability

Table 7 shows that there is a difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0.005 which is greater than the 0.05 level of significance accepts the null hypothesis.

The result of the non-rejection of the null hypothesis indicates the equality of evaluation among the three groups of respondents which further proves that the Optical Character Reader of a Braille Unicode System for the Blind meets the specification and requirements of the respondents in terms of Portability.

4. Cost-effectiveness

Table 7 shows that there is a difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0 which is less than the 0.05 level of significance accepts the null hypothesis. The result of the rejection of the null hypothesis indicates the differences of evaluation among the three groups of respondents which tells that there is a difference in terms of knowledge or experience in cost among the groups of respondents.

IV. CONCLUSIONS

On the account of the foregoing significant findings the following conclusions were made:

1. The stages undertaken in the development of the Optical Character Reader of a Braille Unicode System for the Blind sign the SDLC followed the system engineering procedure with the steps of Defining Requirements to itemize the specification and needs of target client, Iteration of Integration and Testing for the development, coding, designing, and prototyping until customer satisfaction then Deployment to the client and Maintenance. Those steps will help to provide the highest satisfaction of the users.
2. The result of the assessment of Students, Staffs, and IT Practitioners to the accuracy, efficiency, portability, and cost of the Optical Character Reader of a Braille Unicode System for the Blind is Good therefore recommended for implementation.
3. There is a significant difference in the assessment of the Students, Staffs, and IT Practitioners on the Braille Unicode System using Optical Character Reader for the Blind in terms of efficiency, portability and cost-effectiveness while there is no significant difference in terms of accuracy.
4. Based on the problem encountered during the development of the device, the researchers need to consider all the components by making sure that the criteria that need to meet will satisfy the requirements of the device.
5. The problem encountered was solved by adding functionality similar to the functions the beneficiary uses which they recommended as a solution to the problem.

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Name College / Office / Department	Numerical Rating	Adjectival Rating *	Numerical Rating	Adjectival Rating	Numerical Rating	Adjecti Ratin
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2. College of Accountancy and Finance (CAF)	4.66971	Outstanding	4.03655	Very Satisfactory	4.18918	Very Satisfac
3. College of Architecture and Fine Arts (CAFA)	4.30837	Very Satisfactory	3.94186	Very Satisfactory	4.02852	Very Satisfac
4. College of Arts and Letters (CAL)	4.34210	Very Satisfactory	4.20469	Very Satisfactory	4.24452	Very Satisfac
5. College of Business Administration (CBA)	4.61259	Outstanding	4.22977	Very Satisfactory	4.30154	Very Satisfac
6. College of Communication (COC)	4.61321	Outstanding	4.31265	Very Satisfactory	4.37189	Very Satisfac
7. College of Computer and Information Sciences (CCIS)	4.61700	Outstanding	4.36787	Very Satisfactory	4.40188	Very Satisfac
8. College of Education (CoEd)	4.83530	Outstanding	4.51614	Outstanding	4.65459	Outstan
9. College of Engineering (CE)	4.64262	Outstanding	4.48655	Very Satisfactory	4.50291	Outstan
10. College of Human Kinetics (CHK)	4.37118	Very Satisfactory	4.453627	Very Satisfactory	4.46324	Very Satisfac
11. College of Law (CL)	4.76808	Outstanding	3.89484	Very Satisfactory	3.98469	Very Satisfac
12. College of Political Science and Public Administration (CPSPA)	3.10760	Very Satisfactory	3.62869	Very Satisfactory	3.62885	Very Satisfac
13. College of Science (CS)	4.77788	Outstanding	4.66186	Outstanding	4.66890	Outstan
14. College of Social Sciences and Development (CSSD)	4.71410	Outstanding	3.84309	Very Satisfactory	4.02857	Very Satisfac
15. College of Tourism, Hospitality and Transportation Management (CTHTM)	4.77877	Outstanding	4.20041	Very Satisfactory	4.32307	Very Satisfac
16. Graduate School (GS)	4.81288	Outstanding	4.80424	Outstanding	4.78720	Outstan
17. Institute of Technology (ITech)	4.76887	Outstanding	3.88485	Very Satisfactory	4.03472	Very Satisfac
18. Open University System (OUS-SD)	4.94183	Outstanding	4.98468	Outstanding	4.96473	Outstan
19. Open University System (OUS-ODE)	4.94183	Outstanding	4.92259	Outstanding	4.93945	Outstan
20. Open University System (OUS-INE)	4.94183	Outstanding	4.90292	Outstanding	4.95985	Outstan
21. Open University System (OUS-ICPD)	4.94183	Outstanding	4.99147	Outstanding	4.96975	Outstan
22. National Service Training Program Office (NSTP Office)	4.98549	Outstanding	4.99912	Outstanding	4.99306	Outstan
23. Ninoy Aquino Library and Learning Resources Center (NALLRC)	4.92294	Outstanding	4.96845	Outstanding	4.96160	Outstan
24. PASUC Evaluation Committee Office (PECO)	4.80580	Outstanding	4.68222	Outstanding	4.64580	Outstan

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* For purposes of determining the Adjectival Rating, please use the following rating scale:

Interval	Final Rating	Adjectival Interpretation
4.50001 – 5.00000	5	Outstanding
3.50001 – 4.50000	4	Very Satisfactory
2.50001 – 3.50000	3	Satisfactory
1.50001 - 2.50000	2	Unsatisfactory
0 – 1.500000	1	Poor

Evaluated and Verified by:

Dean GISELA MAY A. ALBANO
College of Computer and Information Science

Dean NICOLAS T. MALLARI
College of Social Sciences and Development

Dir. SANJAY P. CLAUDIO
Quality Assurance Center

Dean REMEDIOS G. ADO
College of Engineering
Open University System-IME

Dean AMIR M. CRUZ
Institute of Technology

Dean MARIETTA D. REYES
College of Tourism, Hospitality and Transportation Management

Dean LILIAN M. LITONJUA
College of Accountancy and Finance

Dean MARIPRES P. PASCUA
College of Human Kinetics

Dean JOSELYN R. LUTAP
College of Architecture and Fine Arts

Dean EVANGELINA S. SERIL
College of Arts and Letters

Dean RAQUEL G. RAMOS
College of Business Administration

Dean DIVINA T. PASUMBAL
College of Communication

Dean GEMY LITO L. FESTIN
College of Law

Dean ANTONIUS C. LIMAO
College of Political Science and Public Administration

Dean LINCOLN A. BAUTISTA
College of Science

Dean, MA. JUNITHESMER D. ROSALES
College of Education
Graduate School

Dir. MARCELA R. FIGURA
Ninoy Aquino Library and Learning Resources Center

Dir. ROVELINA B. JACOLBIA
National Service Training Program Office
Open University System-NSTP

Dr. GUILLERMO O. BERNABE
PASUC Evaluation Committee Office

Dir. Rosemariebeth R. Dizon
Open University System-IODE

Exec. Dir. CARMENCITA L. CASTOLO
Open University System
Vice-Chair, Sector Core Group

Reviewed by:

AVPAA EDELYN M. MARIANO
Chair, Sector Core Group

Recommending Approval:

Dr. MANUEL M. MUHI
Vice President for Academic Affairs

Approved by:

Re:) of the ppines
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
Sta. Mesa, Manila

OFFICE PERFORMANCE COMMITMENT AND REVIEW (OPCR) FORM

I, Remedios G. Ado, of the College of Engineering of PUP-Main commit to deliver and agree to be rated on the attainment of the following targets in accordance with the indicated measures for th 08 December 2018.

Dr. Remedios G. Ado
Dean, College of Engineering
Date: _____

Reviewed and Recommended for Approval by:	Date	Approved by:	Date
Dr. Manuel M. Muhi Vice President for Academic Affairs		Dr. Emanuel C. De Guzman President	

OFFICE FINAL OUTPUT (OPO)	SUCCESS INDICATORS	ACTUAL ACCOMPLISHMENTS	Rating Q[1]	E[2]	T[3]	A[4]	REMARKS
ategic Priority:							
Academic Program Development							
1.1 Outcomes-based syllabus developed for all courses	90% (20/22) of 1st year courses have corresponding OBE syllabi (E)	100% (22/22) of 1st year courses have corresponding OBE syllabi (E)		5.00			BSCE: 2 BSCPE: 5 BSEE: 2 BSECE: 2 BSIE: 2 BSME: 1 BSRE:1
1.2 Faculty Immersion	At least 5 faculty members underwent industry immersion for at least 3 days within the year (E)	100% (5/5) faculty members underwent industry immersion for at least 3 days within the year		5.00			

Received

Republic of the Philippines
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
Sta. Mesa, Manila

Sector : ACADEMIC SECTOR
Name of Office : COLLEGE OF ENGINEERING

OPCR SCORE CARD
January to June 2018

Item/s	Score Given by Core Group			Score Given by Validating Team			Remarks
	Q	E	T	Q	E	T	
Strategic Priority							
Total Points	-	-	-	-	-	-	
Core Functions							
Number of Graduates		5.00000			5.00000		
Performance in Licensure		5.00000			5.00000		
Faculty Evals (by supervisor)	5.00000			5.00000			
Faculty Evals (by students)	4.18519			4.18519			
Requests/Queries (simple)	-		5.00000			5.00000	
Requests/Queries (complex)			5.00000			5.00000	
CSS (number of VS or better)		5.00000			5.00000		
CSS (actual rating)	4.84530			4.84530			
CSS (submission)			4.80000			4.80000	
Total Points	14.03049	15	14.8	14.03049	15	14.8	
Total Points (SP + Core)	14.03049	15	14.8	14.03049	15	14.8	
Total no. of Item Ratings (SP+Core)	3	3	3	3	3	3	
Average Rating (SP+Core)	4.87005			4.87005			
Weighted Ave. (SP+Core) (80%)	3.89604			3.89604			
Support Functions							
Attendance		4.47619			4.47619		
DTR		2.05051			2.05051		
Subject Offerings	-		5.00000			5.00000	
Class Records		2.13131			2.13131		
Gradesheets		2.25253			2.25253		
Teaching Assignments			5.00000			5.00000	
Clearance		3.95238			3.95238		
QAR			5.00000			5.00000	
Total Points	-	14.86292	15	-	14.8629	15	
Total no. of Item Ratings (Support)	-	5	3	-	5	3	
Average Rating (Support)	3.73287			3.73287			
Weighted Ave. (Support) (20%)	0.74657			0.74657			
Final Rating (Jan. to June)	4.64262			4.64262			

Validated by : Dir. Archie D. Urrutia/Dir. Rocildon P. Bernarte
Head of Validating Team

Conforme : OIC Remedios G. Ada
Head of Concerned Unit

AVPAA Edelyn M. Mariano
Head of Sector Core Group