PROCEEDINGS OF

THE 5th RMUTT GLOBAL BUSINESS AND ECONOMICS

INTERNATIONAL CONFERENCE

May 23, 2019
Faculty of Business Administration
Rajamangala University of Technology Thanyaburi

RTBEC 2019

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BUSINESS CHALLENGES | 2025

Preface

RMUTT Global Business and Economics International Conference 2019 (RTBEC 2019) aims to be an academic stage to publicize international researches in business administration and economics field for students, professors, scholars, and researchers as well as the general public who are interested in these researches. The scope of this conference covers all fields of business administration such as business management, logistics and supply chain management, business engineering management, international business administration, human resources development, marketing, accounting, finance, information technology, business economics, and other related fields.

This international conference has been held for 5 consecutive years according to the standard and regulations in hosting international academic conference. The theme of this year conference is "Business Challenges 2025" which would be held on May 23, 2019 at the RMUTT Innovation & Knowledge Center, DD Mall, Kamphaeng Phet 2 Road, Chatuchak, Bangkok, Thailand. This year conference was well-received with numerous academic and research papers from many countries including Japan, the Republic of the Philippines and the Republic of Indonesia.

Moreover, this international conference is also a strategic implementation of our university in raising the standard of research to build up knowledge and innovation with appropriate procedure in order to reach out to people and the wider society. It is a way to add new and important channel in spreading the knowledge from the researches and become the medium for exchanging the experience in order to improve the researches and better serve the needs from business and industrial sector. In addition, it also helps increase the capability of researchers within business administration field in conducting the researches and contribute to the sustainable development of the country's economy.

Furthermore, this conference was highly successful due to the great collaboration received from various relevant parties, in which the conference committee would like to sincerely thank all the attendants, experts, supporters, staff, management, lecturers from the Faculty of Business Administration, and the management from Rajamangala University of Technology Thanyaburi which have given us the great support to this event.

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The Faculty of Business Administration,
Rajamangala University of Technology Thanyaburi
May 2019

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A Speech for the Report of
RMUTT Global Business and Economics Conference (RTBEC)
"Business Challenges 2025"
by Assistant Professor Dr.Nartraphee Chaimongkol
Dean of Faculty of Business Administration
Rajamangala University of Technology Thanyaburi
Thursday, 23 May 2019, 9.30 a.m.

The Vice President of RMUTT,
International experts,
Distinguished guests and participants,

On behalf of the Faculty of Business Administration, I wish to express my sincerest gratitude for you to honor the RMUTT Global Business and Economics Conference (RTBEC) organized by the Faculty of Business Administration, Rajamangala University of Technology Thanyaburi with your presence and opening remark today.

The conference is organized in compliance with the policies of RMUTT which emphasize on providing tertiary education concentrating on developing professional skills with the qualities and capacity essential for future career as well as providing academic services to promote creation of jobs and competitive potential. RTBEC 2019 is the fifth international conference and the sixth national conference organized by the Faculty of Business Administration, RMUTT with the expected valuable outcomes and particularly the usefulness for both RMUTT and related partners who continuously extend the outcome to expand bilaterally and multilaterally academic collaborations and establish international knowledge management systems which are linked and supported academic cooperation and exchanges widely and continually in the future. Globalization has created a more interconnected, interdependent and complex world for decades. Disruptive powers of technology are supporting economic growth, new-age innovation and new business landscape. Today, nearly every consumer activity has shifted to the digital behavior of using social media, online advertising and e-commerce. Thus, most companies shall incorporate digital perspective to thier business models, plan and update our knowledge to think broadly about the future and "Business Challenges in 2025".

Therefore, the Faculty of Business Administration has been intentionally conducting the RTBEC with the purposes to support the teachers, researchers, academicians, and higher education students to exchange their knowledge and experiences on business and economics together with building interpersonal relationship among the conference participants both domestically and internationally. Participants in this event include international and national experts, executives, instructors, researchers, academicians, and higher education students. More importantly, foreign guests from The United States of America, the Republic of the Philippines, Japan and Indonesia are invited as Keynote Speaker, International Committee Chairs and experts.

The conference would be held on May 23, 2019. A keynote lecture entitled "Business Challenges 2025" would be delivered by Professor Dr. Sak Onkvisit, Professor of Marketing in the Lucas College and Graduate School of Business, San Jose State University. The conference sessions will be followed in the afternoon.

Now I would like to take this opportunity to invite Assistant Professor Dr.Sommai Pivsa-Art, the Vice President of RMUTT for an opening remark of the RMUTT Global Business and Economics Conference (RTBEC) on "Business Challenges 2025."

Please welcome, sir.

An Opening Remark of
RMUTT Global Business and Economics Conference (RTBEC)
"Business Challenges 2025"
by Assistant Professor Dr.Sommai Pivsa-Art
The Vice President of Rajamangala University of Technology Thanyaburi
Thursday, 23 May 2019

International experts,
RMUTT Executives,
Distinguished guests and participants,

I would like to express my sincere thanks for an invitation to make an opening speech on the RMUTT Global Business and Economics Conference (RTBEC) entitled "Business Challenges 2025" which is organized by Faculty of Business Administration, Rajamangala University of Technology Thanyaburi today.

The conference is organized in compliance with the policies of RMUTT which emphasize on providing tertiary education that focuses on developing professional skills with the qualities and capacity essential for future career as well as providing academic services to promote creation of jobs and competitive potential. Besides, this is also to face with the current world's development trend which concentrates on new knowledge development and integrated research-based learning in order to benefit society and community.

I acknowledge with deep appreciation that this conference has widely gathered an attention from international participants worldwide. Besides, this conference has also been honored by the experts of the institutions globally recognized from The United States of America, the Republic of the Philippines, Japan and Indonesia who accepted our invitations to deliver keynote, special lectures and share knowledge, especially Professor Dr. Sak Onkvisit, Professor of Marketing in the Lucas College and Graduate School of Business, San Jose State University, who is the Keynote speaker of the conference.

I hope that all of you would create such opportunities to exchange and transfer knowledge, to develop mechanisms and processes for working together in the future, and to obtain the mutual benefits among the attended participants as a result.

Ladies and Gentlemen, may I thank each and every one of you for sacrificing your valuable time to join this opening ceremony. Now I would like to take this opportunity to open the conference on "Business Challenges 2025".

Thank you.

KEYNOTE SPEAKER

Professsor Dr.Sak Onkvisit

Professor of Marketing in the Lucas College and Graduate School of Business

San Jose State University

Sak Onkvisit is Professor of Marketing in the Lucas College and Graduate School of Business, San Jose State University. He has been associated with San Jose State University since 1986 and received early tenure in 1989. He began his teaching career in 1976 after receiving his doctoral degree (major in marketing, minor in international business) from the University of Kentucky.

Professor Onkvisit has authored several books. His *International Marketing: Analysis and Strategy* textbook is internationally recognized and has been adopted in the United States, the United Kingdom, Australia, India, and other countries. He has published in as *Journal of Advertising Research*, *Columbia Journal of World Business*, *Business Horizons*, *Journal of the Academy of Marketing Science*, and *International Marketing Review*.

Dr.Onkvisit has taught undergraduate, MBA, and doctoral courses in a number of countries (including Thammasat University and Chulalongkorn University in Thailand, Peter F. Drucker and Masatoshi Ito Graduate School of Management in the United States, and Tomsk State University in Russia).

Dr.Onkvisit was a 1993 - 1994 John F. Kennedy/ Fulbright Senior Scholar at Thammasat University, thus being the first Thai- American recipient of the award to provide services in Thailand. In 2006, he served as a Fulbright Senior Specialist at Tomsk State University in Russia.

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National and International Conference 2019
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10.00 - 11.00	Keynote Speech "Business Challenges 2025" Delivered by Professor Dr.Sak Onkvisit Professor of Marketing in the Lucas College and Graduate School of Business, San Jose State University
12.00 - 13.00	**Lunch**
	International Conference
13.00 - 14.50	TECH-SESSION A (BALL ROOM) Professor Dr.Sak Onkvisit — Chairman Associate Professor Dr.Chanongkorn Kuntonbutr — Co-Chairman
14.50 - 15.10	**Refreshment**
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National Conference						
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	2. Asst. Prof. Dr.Suramongkol Nimchit Co- Chairman	2. Asst. Prof. Dr.Tassin Srivarapong Co- Chairman	2. Asst. Prof. Dr.Piyachat Burawat Co- Chairman	2. Asst. Prof. Dr.Youdthachai Lertworaprachaya Co- Chairman	2. Asst. Prof. Dr.Sureerat Inmor Co- Chairman	2. Dr.Thanwarat Suwanna Co- Chairman
14.40 – 15.00	**Certificate Presentation and Group Photo**					
15.00 – 17.20	1. Asst. Prof. Dr.Salitta Saribut Chairman	1. Asst. Prof. Dr.Supa Tongkong Chairman	1. Asst. Prof. Dr.Kusuma Dampitakse Chairman	1. Asst. Prof. Dr.Madaoh Sulong Chairman	1. Dr.Krisada Chienwattanasook Chairman	1. Asst. Prof. Dr.Paphapat Akkarangkul Chairman
	2. Dr.Winyu Proykratok Co- Chairman	2. Dr.Thanompong Panich Co- Chairman	2. Dr.Duangporn Puttawong Co- Chairman	2. Dr.Wasana Sinrungtam Co- Chairman	2. Dr.Sarakul Sukortprommee Co- Chairman	2. Dr.Umawasee Sriboonlue Co- Chairman

Technical Session Program	
Date / Time	23 May 2019
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Co-Chair	Associate Professor Dr.Chanongkorn Kuntonbutr
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Technical Session Program	
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Co-chair	Assistant Professor Dr.Kanokporn Chaiprasit
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16.10 - 16.30	Cooperative Trading House Digital Marketing Activities of Peoples Economy in East Java Province By Fitria Widiyani Roosinda, Diana Rapitasari and Tira Fitriawardhani
16.30 - 16.50	2D Simulation for Solar Power System Load and Harvest Computation By Shiela Dona B. Sillan
16.50 - 17.00	**Closing Ceremonies: Certificate Presentation and Group Photo**

A Study on the Causes and Effects of Delays in Indian Construction Projects

Tenzing Namgyal[1]

Tsutomu Konosu[2]

Abstract

India's construction industry is one of the most important sectors that provides the main motivating force behind India's national economy. However, many projects experience extensive delays which result in them surpassing the originally decided delivery time and cost. This construction delays became common problems in civil engineering project in India. Therefore, this research aims to investigate and identify the most significant factors causing delays in Indian construction projects and understand its effects in detail. This research was conducted via a detailed literature review and questionnaire survey. From the literature review and with the help of the case study, 50 different causes of delays were categorized into six major groups, with five effects of the delays found. Those results were assigned rankings in general as well as based on contractors, consultants, and clients. Furthermore, the questionnaire and personal interviews were overlooked with participants (contractors, owners, consultants and others) from the Indian construction industry in order to shortlist the top ten most significant factors in the Indian context. Finally, recommendations are given to avoid delays in Indian construction projects.

Keywords: Construction Management, Causes of Delays, Effects of Delays

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Introduction

The construction industry has a significant impact on the economies of all countries. The construction industry is one of the sectors that provide the crucial foundations for economic development and prosperity. Basically, construction industry consists of three main components: Real-estate construction that includes residential and commercial construction; infrastructure building which includes roads, railways, and power; and industrial construction that consists of oil and gas refineries, pipelines, textiles and so on. Government contracts with construction industry are aimed at developing infrastructure related to health, transport, and education. The construction industry is essential for the prosperity of any country. Over the last five decades, - the Indian construction sector has become a part and parcel for the country's socio-economic development. According to Doloi, et al. (2012), construction is the second largest economic activity in India after agriculture, contributing around 6 to 9% of the country's total GDP from 2008 to 2012, and has registered annual growth rates of 8 to 10%.

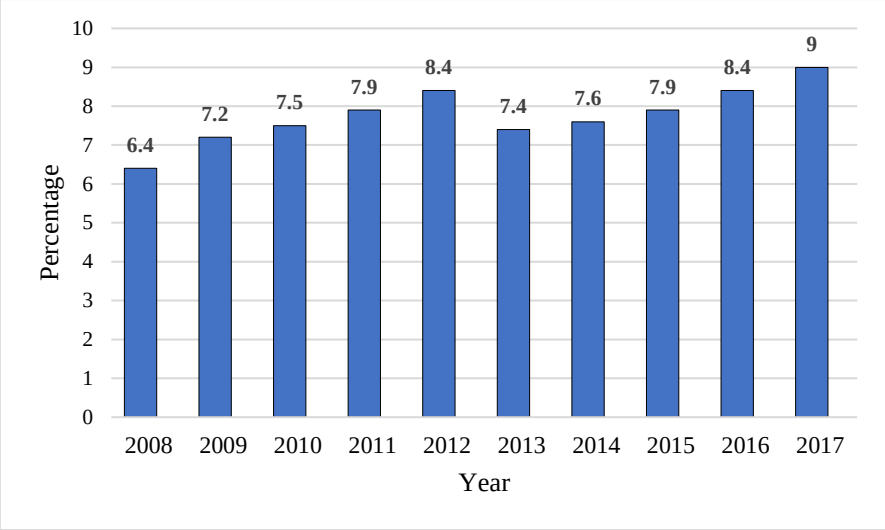

Figure 1 GDP Share of The Indian Construction Sector

Source: Tradingeconomics.com/ central statistical organization India

The construction industry becomes increasingly complexity and needs a great deal of management knowledge since time and costs are very limited. However, the construction industry of India still faces problems, such as poor workmanship and lack of equipment. That being said, many construction projects in India have experienced extensive delays and resulted in initially fixed delivery times and cost estimates being exceeded. The key performance measures of construction projects in the country are reportedly falling, including in terms of cost, time, and quality. The construction process could be classified into three phases: - project conception; project design; and project construction. The most project delays typically occur during the construction-phase, during which many unforeseen factors are always involved.

Therefore, construction project delays cause a very basic responsibility for project executors. The present study takes an integral approach and attempts to analyze the impact of the causes on effects of such delays. Some projects take only a few days from the contractual period while others are delayed for over a year. For this reason, it is necessary for the researchers to define all the possible causes of delays to mitigate the possibility of delays in future construction projects.

Literature Review

Ahsan and Gunawan (2010) undertook a study comparing performance of international development projects in India, Bangladesh, and Thailand. The study showed that Indian construction projects had the worst schedule performance. India was found to have the highest in average schedule overrun, with 55% meeting the actual schedule. Ibrahim I Falqi (2004) did a comparative study between construction projects delay in Saudi Arabia and United Kingdom using a questionnaire survey that randomly selected contractors, consultants, and owners. The survey results were analyzed and ranked according to the frequency of occurrence and severity, - finding that construction projects in developing countries suffer more delays than developed countries.

Delays are common to all projects. According to Alaghbari, Razali, Kadir, Salim, and Ernawati (2007), delays are generally perceived as a high-cost, complicate, and high-risk problem encountered during construction projects. Because of the paramount of time for both the owner and contractors, this is the main factor behind disputes and claims leading to law-suits.

Doloi, et al. (2012) researched Indian construction projects using a questionnaire survey and personal interviews. Factor analysis was used to analyze the data and obtained that the prime causes behind construction delays in India were site accidents due to lack of safety measures, poor labor productivity, use of improper or obsolete construction methods, inadequate contractor experience, poor site management and supervision, and delays to material deliveries.

Kog (2017) studies on major delay factors for Nigerian construction projects. In the research, one of the most important measure in determining construction project accomplishment is schedule performance. For that identification of the major construction delay factor is the foremost step to apprehend.

Meanwhile, Raduan, Murali, Lim, and Naresh (2006) researched delay factors and impacts on construction delays in Malaysia using a questionnaire completed by 150 participants including contractors, consultants, and clients. The most significant causes of delays to Malaysian construction projects were: Improper contractor planning; poor site management by contractors; inadequate contractor experience; inadequate client's finances and payment for completed works; problems with sub-contractor; material shortages; labor supply; equipment availability and failure; lack of communication between parties; mistakes during the

construction stage. Finally, six effects of such delays were observed as: time overruns; cost overruns; disputes; arbitration; litigation; and total project abandonment.

Types of Delays in Construction Projects

According to Salunkhe et. al (2014), there are types of delays in construction projects: excusable and non-excusable delay. Excusable delay is usually not occurred by constructors. It is mostly occurred with owner and architect so on. Excusable delay is further divided into two categories; compensable and non-compensable delay. Compensable delay is hugely related with owner, such as change in scope of work, slow decision, late supply of material and so forth. Moreover, constructors are only entitled to an extension of contract time but not allowed to an additional payment. Non-excusable delay is predictable or within constructor's control.

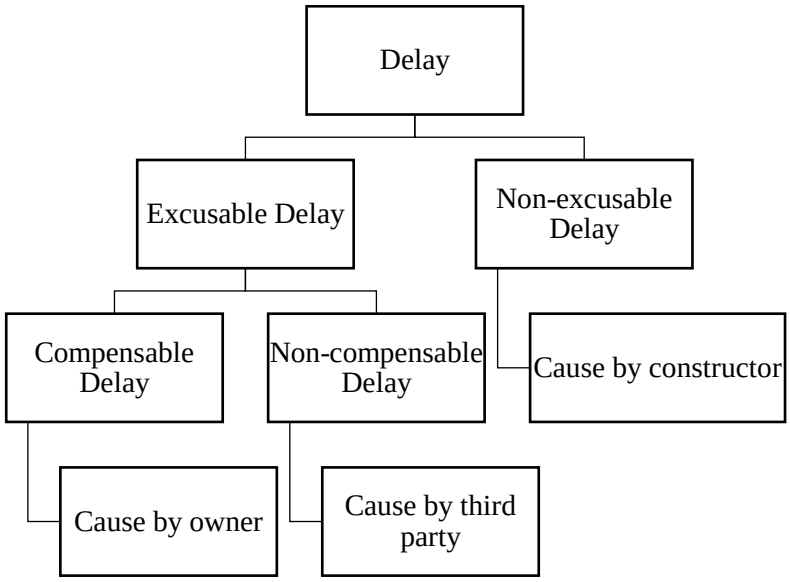

Figure 2 Types of Delay

From the past literature review, 50 causes of construction delays were summarized, which can be categorized into six major groups. Additionally, the questionnaire survey was made to target participants (contractors, clients and consultants) in the Indian construction industry. A summary of the causes and effects of construction delays is given as follows.

Causes of Delays

A. Contractor contributed factors

1. Improper planning.
2. Lack of communication and coordination.
3. Financial problems.
4. Inexperienced contractor.
5. Poor coordination and sub-contractor.

6. Inexperienced project manager.
7. Rework because of errors.
8. Repeated sub-contractor changes.
9. Delays in sub-contractor's work.
10. Insufficient site investigation.
11. Obsolete technology.
12. Wrong choice of bank.

B. Client contributed factors

13. Changed order.
14. Late payment.
15. Slow decision making.
16. Defective design.
17. Complexity of project design.
18. Mistake in contract document.
19. Design change.
20. Long waiting time to approve drawing.
21. Wrong choice of contractor and consultant.

C. Labor contributed factors

22. Shortage of labor.
23. Inefficient labor.
24. Altercation of labor.
25. Lack of motivation at work.
26. Low labor productivity.
27. Absenteeism.

D. Consultant contributed factors

28. Inexperienced construction project consultant.
29. Poor contract management by consultant.
30. Inaccurate site investigation.
31. Poor inspection.
32. Complexity and unclear drawing design.
33. Delay in approval of major work scope changes.
34. Delay in tests and inspections approval.

E. Material and equipment contributed factors

35. Material shortages.
36. Equipment breakdown.
37. Equipment shortages.
38. Material delivery delays.

39. Low quality equipment.
40. Change in material type and specification during construction.
41. Late material procurement.
42. Material theft.
43. Lack of high technology equipment.
44. Unreliable suppliers.

F. External contributed factors

45. Bad weather.
46. Change in government regulations and laws.
47. Construction accidents.
48. Natural disasters.
49. Global financial crisis.
50. Problems with neighbors.

Effects of Delays

According Megha et. at (2013), delay in construction project has a harmful effect on owner, contractor, and consultant. It creates and expands an adversarial relationship, distrust, litigation, arbitration, cash-flow problems and feeling of anxiety between each other. Overall summarized effects of delays are:

1. Time overruns led by exceeding the pre-determined time for project delivery.
2. Cost overruns in overall project and project losses.
3. Litigation between owners, contractors, and consultants.
4. Disrepute caused by losing trust with contractor and ruining company's reputation.
5. Disputes between the project participants.

Methodology

This research was conducted using a detailed literature review from previous research on various construction projects. From that, the factors that cause delays were analyzed. A questionnaire survey was also conducted between participants from related fields, including contractors, owners, consultants and others from the Indian construction field. The survey was mainly conducted through online channels using relevant applications and mail. Data analysis was completed largely through Relative importance index technique.

Questionnaire survey

By using a random sampling technique, a total of 50 questionnaires were distributed to various professionals in India via mail, with 21 survey responses returned initially. Further questionnaires were sent directly to workers from reputable companies in India related to the

research to bring the total survey responses to 50. Responses from the questionnaire survey were finally calculated by using relative importance index and given ranking as an overall separately as well.

Participants and period of study

The total number of participants was 50 which consists of 10 contractors, 21 consultants and 19 clients. There were actually more than 50 participants, but many of them have not fully completed the survey or some of them has no proper identity. Therefore, researcher has finally managed to bring 50 quality participants as it has high accuracy level and less error. The details of the participants are given in Table 1. Although the participants in the questionnaires survey looks quite small, all participants were well professional and the responses received were worthwhile which makes a good level of reliability for the analysis. This whole study is done in six months of period and emphasized more on qualitative than quantitative. Within this period, literature review, organizing interview, questionnaire preparation, data analysis, and finally creating this concrete paper.

Relative important index

This method is conducted to ascertain the relative importance of various delay factors. In this case, a five-point Likert scale was used that ranged from 1 (low importance) to 5 (very important), which was then transformed to the relative importance index (RII) for each factor using the following formula.

Relative important index**,** $\mathbf{RII} = \frac{\sum W}{A*N}$

where,

W = weighting given to each factor by participants (ranging from 1 to 5)

A = the highest weight (5 in this case)

N = the total number of participants (50 in this case)

The relative importance index ranges between 0 to 1, i.e. ($0 \leq RII \leq 1$), higher values indicate greater significance for that cause of delay.

Results

Over 50 causes of delays were identified after reviewing the relevant literature, which can be categorized into several major groups, as follows: -

A. Owner contributed factors
B. Contractor contributed factors
C. Consultant contributed factors
D. Labour contributed factors

E. Material and equipment contributed factors

F. External contributed factors

The relative importance index is chosen to determine the causes and effects of delays in Indian construction projects. It was found that unreliable suppliers and time overruns with a relative important index of 0. 732 were the most important factors and effects of Indian construction delays respectively. Among the six major factors, the most related factor was contractor with 70.6%.

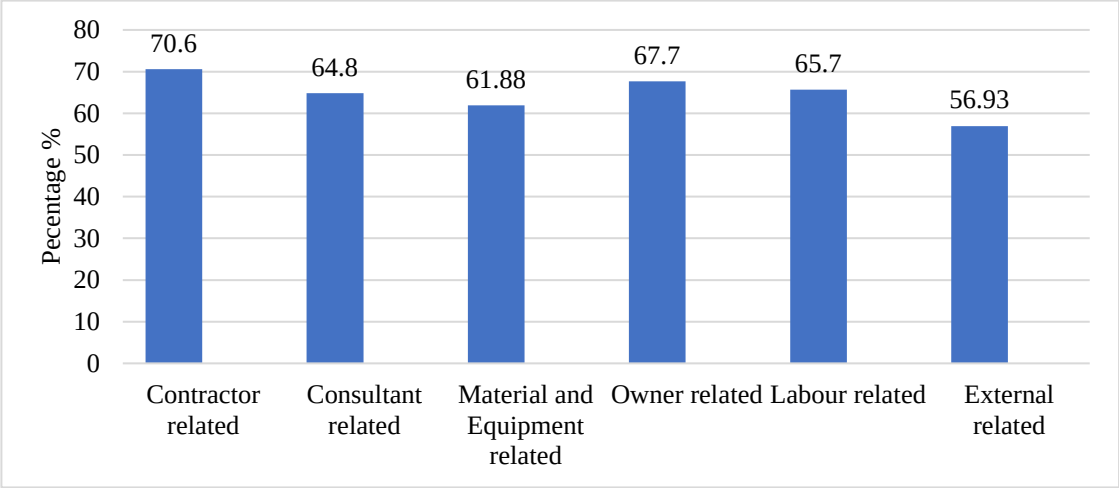

Figure 3 Factors Causing Construction Delays

Participants Demographics

The survey of participant's background is given in Table 1**.**

Table1 Demographic Characteristics of Respondents

Demographic Characteristic	Frequency	Percentage
Sex		
Male	38	76
Female	12	24
Age		
Less than 20	0	0
20-29	17	34
30-39	14	28
40-49	12	24
50 and above	7	14

Table1 Demographic Characteristics of Respondents (Cont.)

Demographic Characteristic	Frequency	Percentage
Education		
Upper Secondary	2	4
Pre-university	3	6
University	31	62
Post Graduate	4	8
Types of Organization		
Contractor	10	20
Consultant	21	42
Clients	19	38
Job Types		
Government firm	19	38
Private firm	31	62
Working Experience		
1-5 years	36	72
6-10 years	5	10
11-15 years	5	10
16-20 years	2	4
21 and above	2	4
Field of specialization		
Building	9	18
Infrastructures	27	54
Mechanicals and Electrical	8	16
Others	6	12

The present study reveals that factors related to contractors, consultants, materials, and equipment have significant impacts on construction project delays. However, labor-related and other general factors do not explain the significant variance among project delays. The following table shows overall response from participants.

Table 2 Overall Participants Response on Causes of Delays

Causes of Delay	Percentage of Respondents Scoring					RII	Rank
	1	2	3	4	5		
1. Contractor related							
Improper planning	10.20	12.24	24.49	24.49	28.57	0.684	14
Lack of communication and coordination	4.08	12.24	36.73	26.53	20.41	0.672	18
Financial problems	12.24	12.24	24.49	28.57	22.45	0.660	22
Inexperienced contractor	12.24	8.16	26.53	36.73	16.33	0.660	23
Poor coordination and sub-contractor	4.17	8.33	27.08	47.92	12.50	0.688	13
Inexperienced project manager	10.20	10.20	38.78	28.57	12.24	0.632	36
Rework because of errors	14.29	10.20	26.53	30.61	18.73	0.644	32
Repeated sub-contractor changes	4.08	22.45	36.73	24.49	12.24	0.624	38
Delays in sub-contractor's work	6.12	8.16	26.53	38.78	20.41	0.704	8
Insufficient site investigation	6.12	10.20	26.53	26.53	30.61	0.716	3
Obsolete technology	6.12	14.29	32.65	26.53	20.41	0.668	20
Wrong choice of bank	16.67	12.50	45.83	12.50	12.50	0.560	49
2. Client related							
Changed order	2.08	10.42	45.83	27.08	14.58	0.656	24
Late payment	10.42	6.25	18.75	37.50	27.08	0.700	9
Slow decision making	4.17	8.33	22.92	39.58	25.00	0.716	2
Defective design	6.25	18.75	20.83	35.42	18.75	0.656	25
Complexity of project design	6.25	10.42	45.83	25.00	12.50	0.628	37
Mistake in contract document	8.33	14.58	47.92	16.67	12.50	0.596	44
Design change	4.17	10.42	43.75	27.08	14.58	0.648	30
Long waiting time to approve drawing	6.25	8.33	33.33	29.17	22.92	0.680	15
Wrong choice of contractor and consultant	12.50	14.58	31.25	27.08	14.58	0.608	41
3. Labour related							
Shortage of labor	18.75	27.08	25.00	16.67	12.50	0.532	50
Inefficient labor	10.64	12.77	21.28	34.04	21.28	0.644	33
Altercation of labor	10.42	20.83	37.50	18.75	12.50	0.580	46
Lack of motivation at work	2.08	10.42	29.17	35.42	22.92	0.704	6
Low labor productivity	4.17	18.75	20.83	31.25	25.00	0.680	16
Absenteeism	8.33	20.83	20.83	37.50	12.50	0.624	39

Table 2 Overall Participants Response on Causes of Delays (Cont.)

Causes of Delay	Percentage of Respondents Scoring					RII	Rank
	1	2	3	4	5		
4. Consultant related							
Inexperienced construction project consultant	12.50	22.92	29.17	27.08	8.33	0.568	48
Poor contract management by consultant	8.16	22.45	24.49	36.73	8.16	0.616	40
Inaccurate site investigation	6.12	12.24	30.61	34.69	16.33	0.672	19
Poor inspection	2.08	12.50	29.17	29.17	27.08	0.704	7
Complexity and unclear drawing design	6.12	16.33	28.57	30.61	18.37	0.664	21
Delay in approval of major work scope changes	6.12	10.20	26.53	34.69	22.45	0.700	10
Delay in tests and inspections approval	8.16	12.24	30.61	34.69	14.29	0.656	26
5.Material and equipment related							
Material shortages	10.00	12.00	36.00	30.00	12.00	0.644	34
Equipment breakdown	4.00	20.00	30.00	36.00	10.00	0.656	27
Equipment shortage	6.00	12.00	30.00	34.00	18.00	0.692	11
Material delivery delays	8.00	6.00	30.00	34.00	22.00	0.712	4
Low quality equipment	8.00	10.00	26.00	32.00	24.00	0.708	5
Change in material type and specification during construction	8.00	14.00	34.00	32.00	12.00	0.652	29
Late procurement of material	6.00	14.00	38.00	30.00	12.00	0.656	28
Material theft	6.00	22.00	24.00	38.00	10.00	0.648	31
Lack of high technology equipment	4.00	18.00	26.00	26.00	26.00	0.692	12
Unreliable suppliers	4.08	12.24	26.53	30.61	36.53	0.732	1
6.External related							
Bad weather	8.00	24.00	34.00	24.00	10.00	0.608	42
Change in government regulations and laws	8.00	20.00	32.00	22.00	18.00	0.644	35
Construction accidents	4.00	16.00	32.00	32.00	16.00	0.680	17
Natural disasters	16.33	20.41	24.49	28.57	10.20	0.580	47
Global financial crisis	10.20	26.53	24.49	26.53	12.24	0.596	45
Problems with neighbors	8.00	30.00	22.00	30.00	10.00	0.608	43

The overall top ten causes of construction delays based on relative importance index is found. From that list, unreliable suppliers are to be the factor that causes most delays, followed by slow decision making, while delays in approval of major work scope changes is the tenth most significant factor.

Table 3 Overall Ranked of Causes of Delays

Rank	Causes of delay	RII
1	Unreliable suppliers	0.732
2	Slow decision making	0.716
3	Insufficient site investigation	0.716
4	Material delivery delays	0.712
5	Low quality equipment	0.708
6	Lack of motivation at work	0.704
7	Poor inspection	0.704
8	Delay in sub-contractor's work	0.704
9	Late payment	0.700
10	Delay in approval of major work scope changes	0.700

Furthermore, causes of delay are ranked separately based on contractor, consultant and clients and there found to be top ten factors. The contractors' point of view in Table 3 shows that sub-contractor's work is major causes of delay.

Table 4 Causes of Delays Ranked by Contractors

Rank	Causes of delay
1	Delay in sub-contractor's work
2	Insufficient site investigation
3	Often changing in sub-contractor
4	Inexperienced contractor
5	Rework because of errors
6	Poor coordination and sub-contractor
7	Slow decision making
8	Low labor productivity
9	Low quality equipment
10	Lack of communication and coordination

Table 4 shows the top ten delay causes ranked by the consultants. Delay in material delivery is the major factor while delay in performing approval of tests and inspections is at bottom place.

Table 5 Causes of Delays Ranked by Consultants

Rank	Causes of delay
1	Delay in material delivery
2	Unreliable suppliers
3	Late payment
4	Lack of high technology equipment
5	Low quality equipment
6	Late procurement of material
7	Change in material type and specification during construction
8	Improper planning
9	Lack of motivation at work
10	Delay in performing approval of tests and inspections

Further, Table 5 details the top ten delays causes ranked by clients and owners, showing that slow decision making is the main causes of these types of delays, while the tenth most significant is long waiting time to approve drawings.

Table 6 Causes of Delays Ranked by Clients

Rank	Causes of delay
1	Slow decision making
2	Poor inspection
3	Unreliable suppliers
4	Low labor productivity
5	Lack of high technology equipment
6	Inefficient labor
7	Late payment
8	Delay in sub-contractor's work
9	Lack of motivation at work
10	Long waiting times to approve drawing

From all causes of delays above, there counted to be its major effects based on the relative importance index and shortlisted five most effects of delay in the following Table 6**.** Among all, time overrun is the main effects with RII 0**.**732 and disrepute has least with RII 0**.**668**.**

Table 7 Overall Effects of Delay

Rank	Effects of delay	RII
1	Time overrun	0.732
2	Dispute	0.724
3	Litigation	0.700
4	Cost overrun	0.692
5	Disrepute	0.668

Discussion and Conclusions

This study attempted to analyze and identify the prime causes and effects of delays in Indian construction projects. The most significant factor causing delay in the construction was found to be unreliable suppliers and its major effect is time overrun. This is important factor that impede effective construction project progress, and companies facing these issues may find it difficult to complete in the market and subsequently suffer negative productivity impacts. Meanwhile, shortage of labour and obsolete technology are least significant delay factors. The delay is also truly non-excusable in Indian context. This research finding will have huge impact on the schedule performance of the Indian construction projects and this result will be a relevant for comparative study on Indian and other developed countries construction projects.

Recommendations for Indian Construction Delays Reduction

The detailed exploration of the causes is clearly identified so that delays can be minimized or avoided. From this study, greater emphasis towards reliable suppliers will reduce this kind of project delay and it is vital for taking reference of experienced contractors for planning project. The following recommendations drawn from participants were well assembled for ascertaining the construction delay solutions. These are the most frequent and significant summarized recommendations based on each party.

For Contractors

The overlook by contractors in managing projects led to huge impact on the completion of projects and for that some recommends drawn are:

- Proper managing of sub-contractor.
- Sufficient in site inspection.
- Create extra time in planning stage.
- Focus on retaining skilled labor.
- Use proper and modern construction equipment.

For Consultants

The most frequent recommends for the consultants are:

- Clearly explain details.
- Procure reliable suppliers.
- Timely delivery of materials.
- Avoid late payment.
- Design should be coordinate before releasing the document.

For Clients

Major delays occurred due to the clients related is common to every project. Recommendations for the clients are:

- Fast decision making.
- Prefer reliable suppliers.
- Not frequent change the order.
- Choosing a consultant with enough experience.
- Determination of realistic duration.

Moreover, Asnaashari et. al (2009) stated that delay is often not the cause of inefficient of management execution as it cannot predict well. However, the level of agility that a management member exhibits in reaction to delays can reveal its strength or weakness in relation to delay analysis and management. In the Indian construction industry, the major reason for slow decision making is the culture of procrastination in every fields of works. Besides, lack of faith between project members and lack of knowledge about construction plays key role in construction delays. Therefore, Indian construction project delays and their effects stand to benefit from enhanced management of future construction projects. Most importantly, there will be a considerable impact on factors such as cost estimation and timely project completion.

Limitations of the Research

With the time limitation, the researcher could not complete the quantitative survey as it would be more reliable in its result if there will be of maximum participants from every party. Moreover, due to the incomplete response, there could not make possible to highlight the self-efficiency survey results.

Future Plan

This research is a part of the master's thesis and conducted in this semester. The detailed understanding of the causes of delays provided by the present study will make it easier to execute better project planning, which will be useful to investigate each factor causing delays which has

the most effect on time overrun, cost overrun and dispute. Nevertheless, the construction is very large field which consists of various types and it is vital to make case study for particular construction body type and analysing its delay factors in detail. The findings of the present study can be used as evidence for comparison studies between various construction types. Furthermore, this research contributes to knowledge in the field and confronts some of the persistent managerial difficulties in construction management.

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The Implementation of Human Value in Thai SME Projects

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Abstract

The purpose of this research was to investigate base knowledge of human value (HV) in Thai small and medium enterprises (SMEs). Previous research has focused on Thai SMEs which makes up 99.78% of enterprises in the country and employ up to 82.22% of total employees from this section. Employees are a part of organizations that drive those companies to achieve their goals. HV is a tool as one of useful quantifying, progressive project tools developed by Takahashi (2017) and was developed based on Earned Value Management (EVM). The investigation of the base knowledge and situation of Thai SMEs was conducted using a questionnaire completed by 30 participants made up of employees. The conclusions from the survey highlight that 51.7% of employees in Thai SMEs have heard of the concept of HV, while 63.4% also prioritized the evaluation for their health. It therefore appears that the employees' priorities were similar to the concept of HV. Therefore, it is suitable to evaluate the HV concept in Thai SMEs.

Keywords: Human Value (HV), Earned Value Management (EVM), SMEs

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Introduction

Thailand is a developing country that economically competes internationally. Thai government has attempted to drive the national economy into the ASEAN market (Chittithaworn, C et al., 2011). The most important part of the economy is made up of small and medium sized enterprises (SMEs) which are a key economic driving force distributed gross domestic product (GDP) 37.0 percent (Auzzir, Z., Haigh, R., & Amaratunga, D., 2018) and accounts for 99.78% of the enterprises in the country (Table 1) and employs up to 60% of the total (Office of Small and Medium Enterprises Promotion, 2018).

Table 1 Number of Small and Medium Enterprises (SMEs) in 2016-2017.

	2016-2017	
Type	**Number**	**Shared of total enterprises**
SMEs	3,046,793	99.78%
Small enterprises	3,028,495	99.18%
Medium enterprises	18,298	0.60%
Large enterprises	6,662	0.22%
Undefined	16	0.00%
Total	**3,053,471**	**100.00%**

Over years, there have been many new SMEs which have failed (Veskaisri, K., Chan, P., & Pollard, D., 2007). Developing the success of Thai SMEs is essential to enhance the national economy by developing new products or improving business processes in SMEs. Generally, it had usually worked in cross-functional collaboration projects due to the firm sizes. In other words, there have been many projects to support these types of firms.

The major development potential is the successful performance of various projects from SMEs. These are made up of numerous small projects that occurred in a limited resource environment context. Especially, the efficiency of each project. Arkardvipart (2017) suggested HV as a useful tool to quantify project progressive tools, and was developed base on Earned Value Management (EVM) as management performance measurement (Castillo, de Amescua Seco, & Cortijo, 2007). However, implementation of HV is limited and there are few case studies at the SME scale. This study will therefore provide greater understanding of how HV can be implemented and provide a new aspect of EVM in Thai SMEs.

Literature Review

Human value index

Arkardvipart (2017) researched EVM based on the HV index (Hirayama, 2015) which introduced human value as consisting of three indices: Productivity Performance Index (PPL),

Ability Index (AI) and Human Value based on Checklists (HVC). Human Value had been adopted and developed to be appropriate for Thai human resource as knowledge of EVM in Thailand. The HV formula changed base on various theories, including:

- The PPI is calculated by the human resource capacity of productivity value based on completed tasks from work breakdown structure (WBS) and work packages. PPI measurements (Figure 1), in which PPI values greater than 1.00 means that the employee works efficiently or very well. A PPI equal 1.00 means the employee is working to the required standard. Finally, if the PPI value is less than 1.00, the employee is not performing well or below the required standard. PPI can be calculated using the following formula.

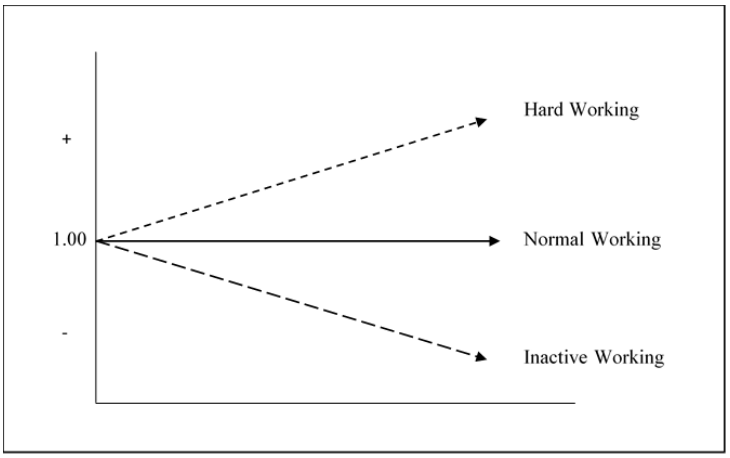

Figure 1 Evaluation of Productivity Performance Index (PPI).

- The Fundamental Ability Index (FAI) was developed to measure a working person's standard skills. FAI has three competencies and 13 competency factors. Further, FAI is divided into three components: ability to step forward (Action); ability to work in a team (Teamwork); and ability to communicate (Communication). These were measured using a 5-point Likert scale.

The FAI scores were measured from all three aspects. Step forward ability (Action) is an examination of the work that is measured by success or achievement in each step of the work. Second, communication ability is a measure of the individual's interpersonal communication ability, that determines how well they communicate correct information in a clear and accurate manner. Third, teamwork ability measures their ability to work in a team, such as through collaboration, problem solving, and negotiation. If the first two indicators are good, there is a possibility that teamwork ability will likely be good as well.

- Key Performance Indicators (KPIs) are measurable values that demonstrate how effectively a company is achieving their key business objectives. Each business uses

different KPI types to measure their success based on their goals and targets. The number of KPIs per individual is recommended to be between four to six KPIs.

Table 3 Implementation of KPI Weight.

No	Key Performance Indicators	Weight of KPIs	Target	Actual	Score	Final Score
1	$KPI_{SM}1$	W 1				
2	KPI_{SM} 2	W 2				
3	KPI_{SM} 3	W 3				
4	KPI_{SM} 4	W 4				
5	KPI_{SM} 5	W 5				
		$SW_i = 100$				100

- Working Ability Index (WAI) is a self-assessment questionnaire which focuses on employees' working ability. This indicator considers the employees' working lives. The questions were divided seven sections, with each part having a different scale score dependent on previous theories (Table 4).

Table 4 Seven-part score of Work Ability Index (WAI).

Items	Number of Questions	Scale	Explanation
1. Current work ability compared with the lifetime best	1	0-10	0 = very poor to 10 = very good
2. Work ability in relation to the demands of job	2	2-10	2 = very poor to 10 = very good
3. Number of current diseases diagnosed by a physician	1 (list of 56 diseases)	1-7	5 or more diseases = 1 point, 4 diseases = 2 points, 3 diseases = 3 points, 2 diseases = 4 points, 1 disease = 5 points, no disease = 7 points
4. Estimated work impairment due to diseases	1	1-6	1 = fully impaired to 6 = no impairment (value marked in the questionnaire; the lowest value selected)
5. Sick leave during the past year (12 months)	1	1-5	1 = 100 days or more, 2 = 25-99 days, 3 = 10-24 days, 4 = 1-9 days, 5 = 0 day
6. Own prognosis of work ability two years from now	1	1-7	1 = hardly able to work, 4 not sure 7 = fairly sure
7. Mental resources	3	1-4	Question points are added and the result is counted as follows; Sum of 0-3 = 1 point Sum of 4-6 = 2 points Sum of 7-9 = 3 points Sum of 10-12 = 4 points

Difference between large firms and SMEs

Carrier (1994) researched intrapreneurship in large firms and SMEs and the impact that the size of the enterprise has on intrapreneurship, human resource management, and intrapreneurship to maintain employees sustainable. SMEs and large firms are both important but there are divergent issues that require consideration from different perspectives.

Table 5 Entrepreneurship in Large Firms and SMEs.

Entrepreneurship in large firms and SMEs		
Factor	Large Firm	SME
Structural context	More rigid structure	Flexible structure
	Logic of intrapreneur detection	Logic of matching or convergence
	Convergence appreciated but not essential	Convergence essential
Relationship related context	Coupling intrapreneur-manager may be difficult	Coupling intrapreneur-entrepreneur is more natural
	Anonymity possible	Anonymity more difficult
Rewards	Promotion not appreciated by intrapreneurs	Promotion value by intrapreneurs
	Difficult to determine	Easy to personalize
	Difficult to estimate	Easier to estimate
Strategic Processes	Generally deliberate and formal	Incremental and heuristic
	Strategy precedes intrapreneur	Intrapreneur precedes strategy
Intrapreneur's dissatisfaction	Consequences usually not threatening	Important danger of competition increased

Table 5 shows the differences between entrepreneurs in large firms and SMEs when considering work rewards that are related to or result from each assessment. For SMEs, Table 5 shows that the value of promotion is greater than in large companies. Different types of organizations make personalize easier to access, including estimate various rewards.

Methodology

Itagaki and Konosu (2008) proposed H-EVM (Human resource based on Earned Value Management), through which HV and HEV (Human Earned Value) were introduced into EVM. Later, Arkardvipart (2017) developed the HV from basis of previous research to be appropriate for Thai human resources, which added four new value indexes: (1) Productivity Performance Index (PPI); (2) Fundamental Ability Index (FAI); (3) Key Performance Indicator (KPI); and (4) Working Ability Index (WAI). The calculation of HV is as follows:

$$HV = \frac{PPI + FAI + KPI + WAI}{4}$$

The present study aimed to investigate the current situation of employee performance evaluation and based knowledge in Thai SMEs. The questionnaire was carried out to research participants who were employees in related project management roles of Thai SMEs with 30 employees. Previous research shows that Thai people have undersized knowledge and understanding of HV, and so this questionnaire, therefore, uses questions that are relevant or consistent with HV assessment to understand whether Thai people understand the HV concept. The data has analyzed by SPSS to evaluate the level of base knowledge and the current situation of Thai SME employee performance evaluations.

A Likert scale was used in the questionnaire to measure approaching principle of measuring attitudes and some of the questions were specifically directed to explore the current situation.

Research Sampling

Finally, a letter requesting collaboration was distributed to a Thai SME that participated in the questionnaire study. The survey had used to collect samples by purposive sampling. The sample group is clearly defined as personnel in SMEs which is Quality Plus Aesthetic International Company Limited is cosmetic manufacturers in Thailand, which has received various standards such as TLS 8001-2010 Certification which is the certificate of Thailand Trust Mark which is about standard quality of product and service, ISO 22716: 2007 Manufacturing of Skin Care ISO 9001: 2015 Development and Manufacturing of Skin Care, Face Care, Hair Care which regarding standard manufacturing and other for the reliability of information and standards of personnel in answering queries.

Research Results

Table 6 Reliability

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.858	.942	36

Table 6 shows that the reliability statistics of survey data form 36 questions are 0.858 where more than acceptable rate that 0.7 will consider high reliability of data.

Table 7 Participant Demographic

	N = 30	
	Quantity	**Percentage**
Gender		
1.Men	14	46.7
2.Women	16	53.3
Total	30	100
Age		
1. 21 – 40 years old	29	96.7
2. 41 – 60 years old	1	3.3
Total	30	100
Education Levels		
1. High school	4	13.3
2. Bachelor's degree	22	73.3
3. Master's degree	4	13.3
Total	30	100
Experience in work		
1. 0 – 1 year	14	46.7
2. 1 – 2 years	8	26.7
3. 2 – 3 years	2	6.7
4. 3 – 5 years	5	16.7
5. More than 5 years	1	3.3
Total	30	100

A total of 30 participants took part in the study, of which 14 were men and 16 women, and most were between 21-40 years old. Most of the participants have achieved a bachelor's degree (73.3%), high school (13.3%) and master's degree (13.3%). In terms of work experience, 46.7% had 0-1 years of experience, 26.7% had 1-2 years of experience, 6.7% had 2-3 years of experience and 16.7% had 3-5 years of experience.

Table 8 Statistical Analysis Question: How well the employees know about Human Value

How well the employees know about Human Value					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, I have experience with it	3	9.4	10.0	10.0
	Yes, but I only know the concept	7	21.9	23.3	33.3

Table 8 Statistical Analysis Question: How well the employees know about Human Value (Cont.)

How well the employees know about Human Value					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Just heard of the concept	15	46.9	50.0	83.3
	I don't know	5	15.6	16.7	100.0
	Total	30	93.8	100.0	
Missing	System	2	6.3		
	Total	32	100.0		

Table 8 shows that 50 percent of employees just heard of the HV concept, 23.3 percent of employees know the concept of HV, 16.7 percent of employees do not know about HV and 10 percent of employees know the concept by experience.

Table 9 Statistical Analysis Question: In the employee health part, do you think that how much important to your evaluation efficiency?

In the employee health part, do you think that how much important to your evaluation efficiency?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	4	12.5	13.3	13.3
	Fair	7	21.9	23.3	36.7
	Good	11	34.4	36.7	73.3
	Very Good	8	25.0	26.7	100.0
	Total	30	93.8	100.0	
Missing	System	2	6.3		
Total		32	100.0		

Table 9 shows that relation between health of employees significant to performance evaluation of employees. 34.4 percent of employees chose "Good" and 25.0 percent of the employees chose "Very Good".

Table 10 Frequencies: Performance Evaluation Method Question

Frequencies: Evaluation Method Question			
	Responses		Percent of Cases
	N	Percent	
Key Performance Indicator	28	40.6%	100.0%
Performance Test	13	18.8%	46.4%
Dollar Sales	9	13.0%	32.1%
Productive Measure	7	10.1%	25.0%
Customer Satisfaction	10	14.5%	35.7%
Other	2	2.9%	7.1%
Total	69	100.0%	246.4%

Table 10 shows frequency statistics of performance evaluation method. This question is multichoice condition and the most chosen one is Key Performance Indicator method with 40 percent, second is performance Test with 18.8 percent, third is Dollar Sales with 13.0 percent

Table 11 Frequencies: Performance Evaluation Channels Question

Frequencies: Evaluation Channels Question			
	Responses		Percent of Cases
	N	Percent	
Document Form	24	51.1%	100.0%
Online Form	8	17.0%	33.3%
Interview	15	31.9%	62.5%
Total	47	100.0%	195.8%

Table 11 shows frequency statistic of Evaluation Channels Question. This question is multichoice condition and the most chosen is document form with 51.1 percent, second is interview performance evaluation with 31.0 percent and third is online form with 17.0 percent.

Table 12 Frequencies: Priority Evaluation Factor Question

Frequencies: Priority Evaluation Factor Question			
	Responses		Percent of Cases
	N	Percent	
Time	24	32.4%	100.0%
Financial Value	10	13.5%	41.7%
Quantity	17	23.0%	70.8%
Quality	21	28.4%	87.5%
Other	2	2.7%	8.3%
Total	74	100.0%	308.3%

Table 12 shows the frequency statistic of priority evaluation factor question. This question is multichoice condition. The most priority in their consideration are time with 32.4 percent, 28.4 percent of quality and 23.0 percent of quantity.

Table 13 Frequencies: Benefits of the Performance Evaluation Question

Frequencies: Benefits of The Performance Evaluation Question			
	Responses		Percent of Cases
	N	Percent	
Improve myself	26	33.8%	100.0%
Promotion	18	23.4%	69.2%
Reward	20	26.0%	76.9%
Satisfaction of Chief	11	14.3%	42.3%
Other	2	2.6%	7.7%
Total	77	100.0%	296.2%

Table 13 shows that most employees 33.8 percent has self-improvement from evaluation and second 26 percent of employees chosen reward which is the benefit from evaluation.

Table 14. Frequencies: Responder for Performance Evaluation Question

Responder for Performance Evaluation Question			
	Responses		Percent of Cases
	N	Percent	
Manager	26	39.4%	100.0%
Ourselves	14	21.2%	53.8%
Human Resource	14	21.2%	53.8%
Director	12	18.2%	46.2%
	66	100.0%	253.8%

Table 14 shows the result that performance evaluation was 39.4% evaluated by manager, 21.2% by themselves, 21.2% by human resource department officer and 18.2% by director.

Discussion and Conclusion

The analysis indicated that only 24.1% of the employees had acknowledged about the theory of human value, while 51.7% had heard about it, showing that most of the participants lacked a proper experience and understanding of it. The participants showed that their knowledge, consideration, and assessment experience were consistent with the HV evaluation. Almost half of participant 40.6% had to evaluate through KPI which might benefit for building up knowledge and enhance possibility to propose new similar methodology.

Based on this research survey of general information of SMEs in Thailand, it was found that most companies had only 1 time per year for the evaluation and it had done through document form. This can be implied in terms of managing information system for not having the effectiveness of collective database. The quantity of evaluation is unequal to the performance of employee, but it needs to have a regular evaluation time table which is suitable for each task, nature and details. Besides, these might lead to chaotic employee database that affects to hardly loading personal data for calculation in HV formula. Electronic records made documentation more complete and faster than paper records Tsai, (2007). The complexity of methodology is thorn in daily works. Therefore, the inappropriate employee database is the one barrier for implementing HV in Thai companies.

In the perspective and priority of employees, operation level staffs give priority to delivering work on time is the first rank. Moreover, more than 50 percentages for health factors shows that there is no relation to performance. These also reflect Thai employee perspective which has different viewpoint with HV methodology.

The research hypothesis was denied according to the result that Thai SMEs lack overall managing in employee life cycle base concept which is the main obstacle. Proposing HV as a new method can possibly be introduced due to KPI intimacy. Nevertheless, implementing full HV concept in Thai SMEs needs to be improved along with employee managing information system.

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Investigation of UIC Digital Transformation Projects in Thailand based on Project Management Competencies Index

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Abstract

In the digitized innovative environment, University-Industry collaboration (UIC) plays a major role in enhancing the strength of the country's in-house technology-based knowledge. In addition, UIC projects are implied for the country's economic competency. However, UIC projects in Thailand are frail and several obstacles have been determined through technological and political aspects. Particularly from the management aspect, these main barriers are project management competencies, which were pointed out from the failure of co-corporate caused by the different experiences of members, inappropriate timetables, and unclear responsibility. This study aimed to identify the associated factors through the lenses of PM in Thai UIC projects and understand the significance level of each factor. The data was collected using a questionnaire survey consisting of quantitative and qualitative discussions with Thai UIC experts. The results provided a quantitative analysis of the level of significance for PM skills and qualitative conclusion of Thai UIC project obstacles. The level of project management and project size comprised the major factors affecting successful UIC collaboration. Moreover, UIC coordinators were found to be significantly important for contact and making knowledge transfer fluent in order to solve the problem of obscurity for members' projects.

Keywords: University-Industry Collaboration (UIC), Project Success factor, Project Management Competency, Skill and Characteristic, Thailand

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Introduction

In the current digitized environment, digital technology involves intensive technology development in many state-of-the-art industries. Many countries have quickly adopted innovation in order to enhance the strength of their technology-based industries. In 2017, Thailand implemented the promotion of a digital transformation (DT) strategy, as demonstrated by an innovation-driven economic model called "Thailand 4.0". The three main sectors driving this model include the public sector, private sector, and university and research institutes.

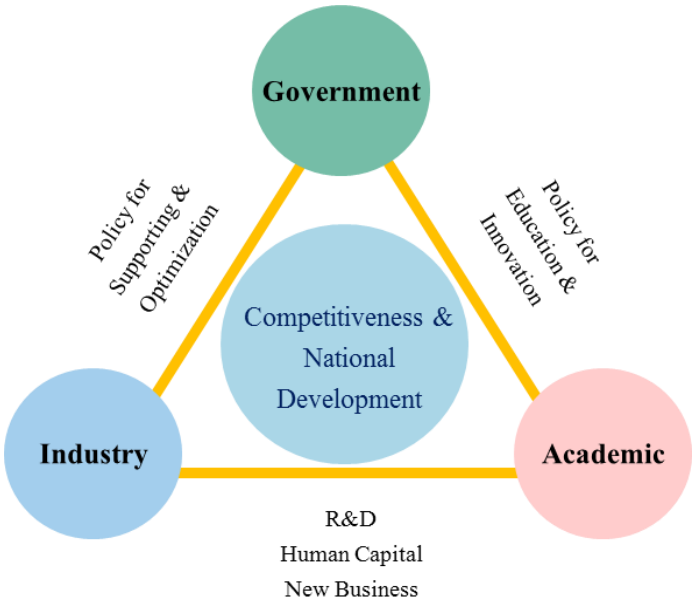

Figure 1 Main Sectors Driving Thailand 4.0

Considering between academics and industry relations, called University-Industry Linkages (UILs), specifically involves collaboration between the private sector and educational institutions. Among these relations, a significant amount of advanced knowledge, experience, and skills were transferred, with knowledge being shared to afford the opportunity to create co-creation value for the product/service.

Over the past decade, there has been a significant amount of research concerning Thai UILs. Highlighted are the interesting results that have been proposed. University-Industry Linkages (UILs) have become more important in terms of the development challenges facing Thailand. However, Thai UlLs are weak in terms of the protection and low level of existent innovation, resulting in minimal private sector efforts to collaborate with universities, as pointed out by Thai authorities.

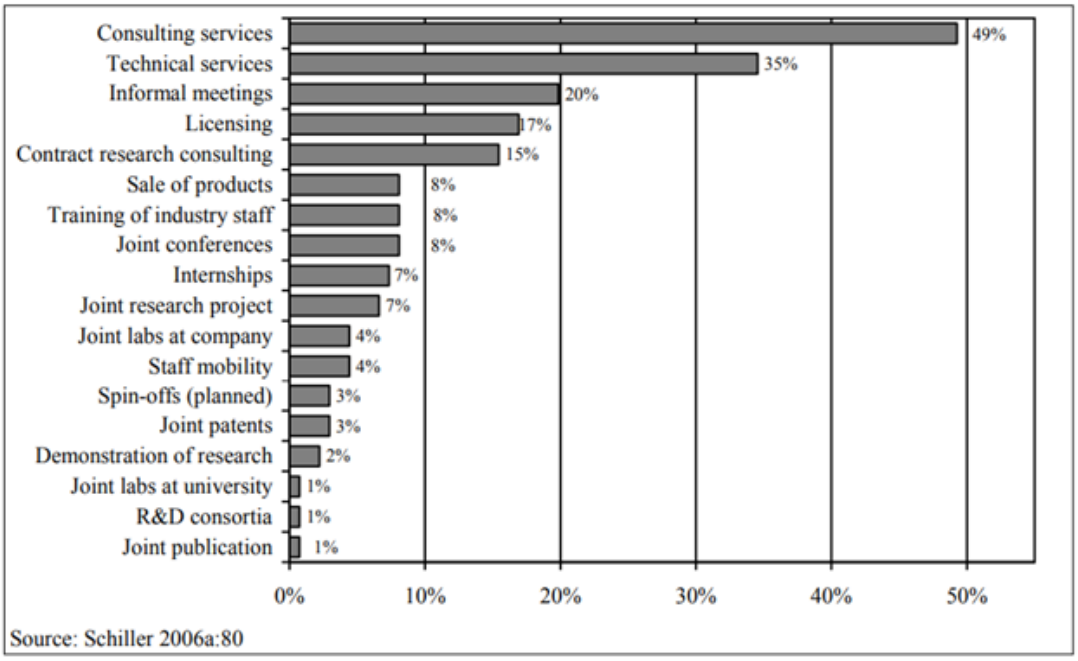

Figure 2 UIL Modes in Thailand (n ＝136)

(Source: Schiller, 2006)

These crucial barriers were likewise roughly analysed on limited aspects of politics and sociology. Nevertheless, from the viewpoint of project management, University-Industry Collaboration (UIC) involves temporary projects for achieving mutual unique ambition. During activities where personal technology knowledge may include explicit knowledge or tacit knowledge transferred in groups, there may be differences in collaborative experience and working environment among project members, which may cross from initial background knowledge. Thus, it is necessary to require consistency in knowledge management and especially project management.

Similarly, it has been shown that project management ability has become a barrier for UIC projects. Notably, PM competency among project members and project member roles is highlighted based on issues concerning differences in commonality experience, unclear responsibility, and problem-addressing ability (Barnes, Pashby & Gibbons, 2002; Motohashi, 2005; Ankrah ＆ Omar, 2015). These barriers hardly appear in UIC activities, but are apparently found in the earlier phase, which could considerably affect the influence on collaboration.

In the last few years, the promotion of the Thailand 4.0 model has gained a lot of supportive policies, such as increasing the ratio of science technology and innovation budget to government budget in 2018, which rose to 4.03 percent from 3.53 percent. A 200% deduction of R&D expense from the earnings before income tax scheme by the Revenue Department,

soft loan for technology development projects by the National Science and Technology Development Agency (NSTDA) and an interest-free loan for R&D and commercialization for innovative products by the National Innovation Agency (NIA) have also been mentioned (Yuwawutto et al., 2001). In particular, projects involve cooperation between the government and private sectors, which has been implemented in the past. The government has pushed the project to form a strategic goal integration plan (Spearhead Program). Moreover, special purpose organizations were established to drive these models in detail, such as the National Science and Technology and Innovation Policy (NSTIC), the Thailand Research Fund (TRF) and others. Obviously, it appears that Thailand is strengthening the country's policies to respond to its desire to be a knowledge-based country.

University-Industry Collaboration (UIC) plays an important part in developing in-house technology for Thai firms as well as creating new co-creation innovation value, which implies economic sustainability for countries. The success of Thailand 4.0, which is a part of archiving Thailand's 20-year national strategy, requires increasing the success rate and acumen relation of UIC projects collaboration. Besides, Thailand has limited knowledge in project management. Thus, it is necessary to consider this perspective.

Review of Literature

Lack of Commonality in Background

Al-Tabbaa and Ankrah (2016) found impediments and social capital interaction in the pre-formation stage of UIC. The results mentioned the first impediment which is the lack of commonality in background caused by differences between two sectors which have separation of clarification. Furthermore, these effects create following problems, such as distrust in a partner and expected responsibility, which converts to unmanaged activities, authority, and duties. Thus, facilitators have the most important role in formulating the foundation and developing cognition in terms of two-way translators. Moreover, there is agreement that, due to the objective set by stakeholders, facilitators should orient understanding, implications, and expectations to UIC members.

In Thailand's current situation, the academic sector faces inadequate cooperation and potential from the industries sector, especially SMEs, which lack adequate basic business-related knowledge as well, including deep data or explicit knowledge. This affects the ability for coding, transferring and absorbing knowledge during the activities. On the other hand, the industries sector also possesses inconsistency concerning the potential for expertise among researchers at Thai universities. Due to the image of unapproachable publishing knowledge, research, or patent and the complex hierarchy of Thai universities and functional organizations, it is more necessary for UIC intermediators to facilitate these individual impediments for each local policy.

Project Coordinator

Because of the nature of UIC project characteristics, independence and impermanence have a positive effect on the willingness and motivation to explore knowledge and methodologies in a new environment. This leads to increasing project success rates. Moreover, new business outcomes are also possible. As per the results, the research proposed a trading zone framework. The trade zone had three main participants including university participants, industry participants, and university-industry coordinators under temporary conditions containing risk-free and special terms.

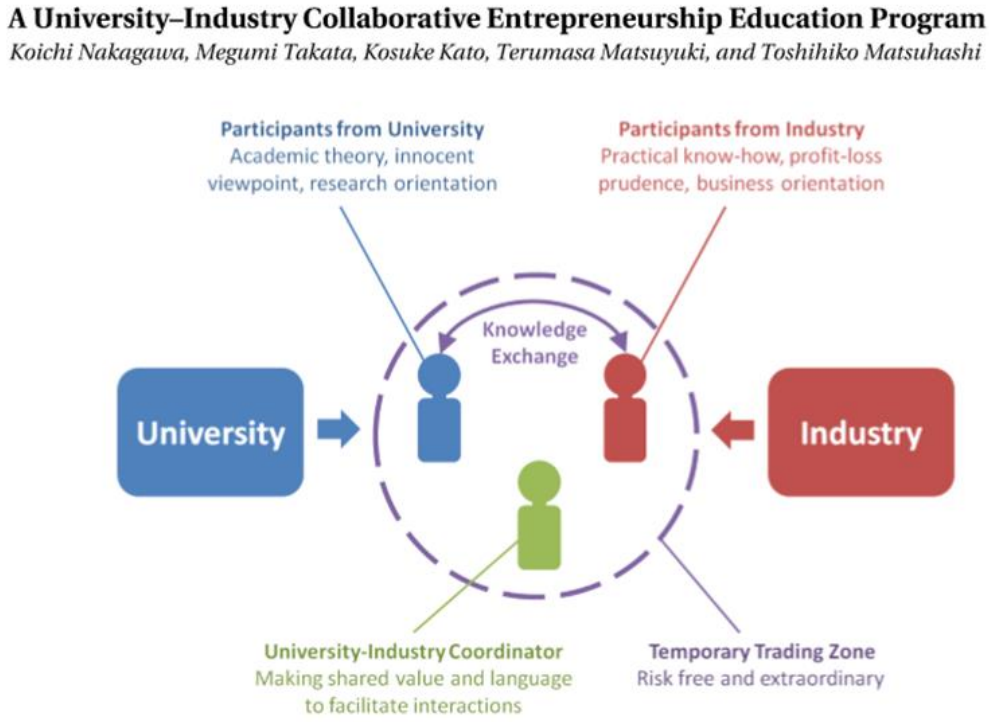

Figure 1. The "trading zone" framework: technology entrepreneurship education through university–industry collaboration

Figure 3 Trading Zone Framework
(Source: Nakagawa et al., 2017)

Highlighted on the UIC Coordinator role was that the coordinator should be staffed from the program organizer in order to contribute to both languages and understanding during the knowledge transfer (Nakagawa et al., 2017). Shared language is important to execute the project work because it helps the participants to share their ideas concerning technology commercialization more efficiently.

To enhance UI success, not only the UIC policies should be considered, but also the development of project champions role/activities and proper environment for the transfer of innovation. These are the main factors that directly affect partner trust, which in turn affects

the level of knowledge and innovation efficiency. Moreover, project champions can significantly involve the redirection of attention for each side, which enables the release of tension and possibly makes it easier to achieve greater success. Bstieler et al. (2015) stated these facts as well.

Managing trust and balancing mutual benefits among partners are the main factors to ensure successful Thai research collaboration (Numprasertchai, & Igel, 2005). A project coordinator acceptable to both sides might be the hidden key to success in the project and take the project across project member relationship related problems.

Project Management Competency

According to the general knowledge of project management, there are 10 areas comprising based knowledge for managing projects along with project life cycles, including project manager competencies, project communication management and project stakeholder management, which are critical to the problem-addressing method to solve the gap in languages and knowledge communication in Thai UIC projects. Through project management overviews, these dimensions should be focused on and emphasized in UIC project activities. Zadeh et al. (2016) previously studied the factors related to project management views in the oil and gas industry.

There are 4 main points of view thoroughly considered including “project-related factors”, “factors related to project management practices”, “human-related factors” and “issue related factors”, which comprise a readable methodology to investigate the factors that contribute to and influence Thai UIC projects. The 4 main factor categories were developed from these research concepts and covered the full dimensions of the project environment which consisted of Enterprise Environmental Factors (EEFs); external and internal and internal Organization Process Assets (OPAs); processes Policies and Procedures and Corporate knowledge base as follows:

1. **Project-related factors**

Capacity and resource factors are mentioned as factors that facilitate or impede UICs in a UIC systemic review (Ankrah & Omar, 2015). Obviously, it is shown that the project resources and project formulation are important parts of initiation in the UIC project phase.

2. **Factors related to project management practices**

The project management competencies have been studied based on various projects. However, project management competencies are unique and comprise different requirements depending on the project characteristics and project objectives. Thus, a UIC project also has to customize and categorize personal project competencies, which includes the basic abilities and skills that affect project activity. Remarkably high project competency levels among members might benefit project efficiency more.

3. Human-related factors and characteristics

Soft skills have been mentioned a lot over the years. In order to successfully work as a team, communication skills and leadership are important factors that drive cooperation besides knowledge or ability characteristics. In this research, there is strong agreement with previous studies that define 2 types of human-related skills including human-related and technical-based from previous research.

4. Digital transformation - related factors

Project nature has an inevitably powerful effect on project activities. The complexity of projects is defined by each ground, knowledge and the typical education major. This research will make determinations through the nature of the technology or knowledge to be transferred, level of digital transformation collaboration and the type of digital transformation strategies referenced from the Thailand 4.0 strategy conception.

Methodology

Research sampling

To answer research main question, this research was designed to apply surposive sampling metholodogy. The structure of the sample was designed to collect survey data from participants of both sectors.

To ensure that the collective data will achieve the research objectives, the participants' qualifications were defined to select participants both from the industry and university. For the standard research condition, experience in related Thai UIC activities was required at least 3 completed projects in total with expertise in project management concepts.

There are 30 participants in total from 5 organizations of Thai academic organizations and 2 Thai firms were selected for qualitative and qualitative survey are shown by Figure 4.

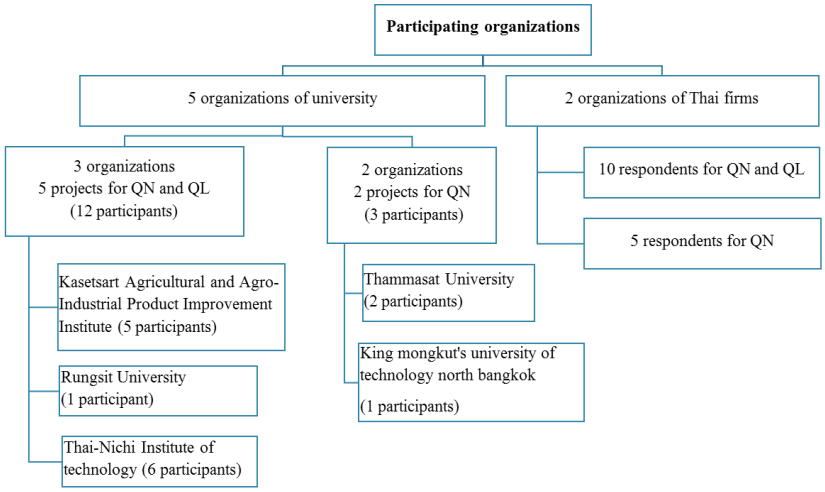

Figure 4 Research Sample Structure

Understanding of the Current Context

Due to Thailand's current situation, new political policies have significantly changed the context of relationships in the UIC context. Therefore, this research aims to study the new current context and emphasize the main factors affecting the success of Thai UIC in addition to quantifying the importance of project management competency in UIC projects.

To extend the research knowledge, the current context, general information, and project experience issues as well as the main elements of PM competencies in Thai UIC for DT projects were obtained from the literature survey. More typical Thai UIC factors through interviews and discussion with 8 experts were also developed.

Table 1 Expert Interview Research Data

No.	Role	Year of Experience	Discipline	Interview Duration (min)
1	Information and Technology Faculty Researcher	4 years	Private Institution	45
2	President of Industrial Management Discipline	13 years	Private Institution	30
3	Business Administration Faculty Staff	6 years	Private Institution	35
4	Business Administration Dean	15 years	Private Institution	35
5	Agricultural and Argo-Industrial Product Improvement Institute Researcher	14 years	State University	30
6	Cillege of Digital Innovation and Information Technology Rector	12 years	Open University	35
7	Directing Manager	11 years	Private Institution	40
8	Directing Manager	5 years	Private Institution	30

The interviews were designed to use a semi-structured interview strategy. An interview form was used for interviews, which were comprised of structured as well as unstructured interviews. Questions and prescribing questions were structured in advance due to the intention to remain flexible during questioning the issues for collection of data while maintaining the particular points to cover the research objective. The research scope created from research of the main question is listed below.

Research Question:

What is/are the critical factor(s) and what is the role of PM competency for project members that influence the success of UIC projects within innovation projects.

Level of Significance

Participants were invited to score their perception of importance for the main factors in each category and the main elements of PM competencies on a five-point Likert scale considering the level of contribution to efficiency for Thai UIC in DT projects. The questionnaires were distributed to a total of 30 professionals representing professions undertaken in Thai UIC for DT projects. Secondly, an analysis of project management competency was conducted. The procedure established the mean score (MS) and weight factor (WF) as well as Relative Importance Index (RII).

Research Results

Reliability

The reliability of the survey data will be determined by using statistics with reliability coefficient normally ranging (α) between 0 and 1. Less than 0.3 is considered low, while more than 0.7 is considered high, following previous research.

The value of Cronbach's α for all factors was 0.945 for the main category factors survey. Accordingly, the research instrument is a reliable tool.

Table 2 Questionnaire Reliability

Category	Cronbach's α
Project-related factors	0.858
Factors related to project management practices	0.867
Human-related factors	0.837
Digital transformation - related factors	0.786
Overall	**0.945**

The calculation for project management competency element survey was 0.958, which also showed acceptable reliability and seemed to be usable for the ranking order in the discussion section.

The questionnaire was distributed to a total of 30 professionals representing professions in Thai UIC for DT projects. From the 30 questionnaires that were distributed, a total of 23 were returned, 14 of which were completed correctly. This represents a response rate of 46%. The summary statistics for the questionnaire survey are shown in Table 3 as follows:

Table 3 Summary Data of Questionnaire Survey

Survey	Values
No. of questionnaires distributed	30
No. of responses received	23
No. of incomplete/invalid responses	9
No. of valid responses (considered in the data analysis)	14
Valid response rate %	46%

Participants' Demographics

The demographics of expertise for interviewing are shown in Figure 5.

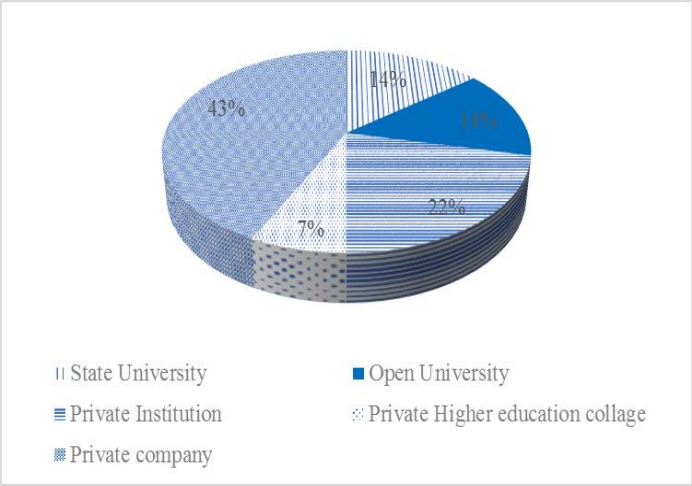

Figure 5 Research Demographics of Participants Categorised by Discipline

Table 4 Importance Index Cellulation and Ranking for Factors Contributing to UIC for digital transformation project

Factors	No. of Respondents	Not important	Slightly Important	Moderately Important	Important	Very Important	Sum of Weighted Values	Relative Important Index (RII)	Group Rank	Overall Rank
Project-related factors								**79.0%**		
Organization size	14	1	1	2	8	2	10.2	73%	7	11
Size of project	14		1		7	6	12	86%	2	**2**
Type of project objective	14		1	3	4	6	11.4	81%	3	5
Type of project forms	14		1	4	6	3	10.6	76%	5	9
Adequate resources	14				6	8	12.8	91%	**1**	**1**
Inflexible university policies	14		1	3	4	6	11.4	81%	3	5
Corporate stability	14		2	2	8	2	10.4	74%	6	10
Level of project management	14				6	8	12.8	91%	**1**	**1**
Organization culture	14	1	1	1	5	6	11.2	80%	4	6
Project organization structure	14		1	5	7	1	10	71%	8	12
Policy/legislation/regulation to guide/support/encourage UICs	14		3	2	7	2	10	71%	8	12
Type of industry cluster	14		2	4	6	2	10	71%	8	12
Factors related to project management practices								**78.9%**		
Leadership/Top management commitment and support	14		1		8	5	11.8	84%	2	3
Collaboration champion	14			2	6	6	12	86%	**1**	**2**
Teamwork and flexibility to adapt	14			3	6	4	10.6	76%	6	9

Table 4 Importance Index Cellulation and Ranking for Factors Contributing to UIC for digital transformation project (Cont.)

	Factors	No. of Respondents	Not important	Slightly Important	Moderately Important	Important	Very Important	Sum of Weighted Values	Relative Important Index (RII)	Group Rank	Overall Rank
	Project management	14		1	1	9	3	11.2	80%	4	6
	Cross-sector differences/similarities	14			3	9	2	11	79%	5	7
	Project management procedures	14		1	2	10	1	10.6	76%	6	9
	Project management systems and tools	14			4	9	1	10.6	76%	6	9
	Project scope definition	14		1	5	4	4	10.6	76%	6	9
	Level of stakeholders' participation during project execution	14			5	8	1	10.4	74%	7	10
	Level of senior management support/engagement	14		1	1	7	5	11.6	83%	3	4
	Impact of conflicts on priorities	14		2	1	10	1	10.4	74%	7	10
Human-related factors									**72.9%**		
	Mutual trust and commitment	14		1		10	3	11.4	81%	2	5
	Absorptive capacity	14		1	5	6	2	10.2	73%	4	11
	Project management teamwork experience	14		1	1	9	3	11.2	80%	3	6
	Project management team's education level	14		3	6	4	1	9	64%	6	14
	Key personnel's skills and characteristics	14	1	2	4	6	1	9.2	66%	5	13
	Commonality in background	14		3	6	5	0	8.8	63%	7	15
	Trust and compatibility of partner	14			3	6	5	11.6	83%	**1**	4

Table 4 Importance Index Cellulation and Ranking for Factors Contributing to UIC for digital transformation project (Cont.)

	Factors	No. of Respondents	Not important	Slightly Important	Moderately Important	Important	Very Important	Sum of Weighted Values	Relative Important Index (RII)	Group Rank	Overall Rank
Digital transformation - related factors									**75.0%**		
	Nature of the technology/knowledge to be transferred	14	1	1	2	9	1	10	71%	4	12
	Level of digital transformation collaboration	14		1	1	11	1	10.8	77%	2	8
	Type of digital transformation strategies	14			5	5	4	11	79%	**1**	7
	Type of DT forms	14		1	4	8	1	10.2	73%	3	11

The summary calculation results are shown as determined based on relative importance index (RII) value. Respectively, project-related factor category is 79%, factors related to project management practices category is 78.9%, Digital transformation - related factors is 75%, and Human-related factor category is 72.9%. The most important factors with 91% are adequate resources and level of project management, followed by the size of project, project champion and project communication, as presented. For clarity in illustration, the conclusion data is presented in Figure 6.

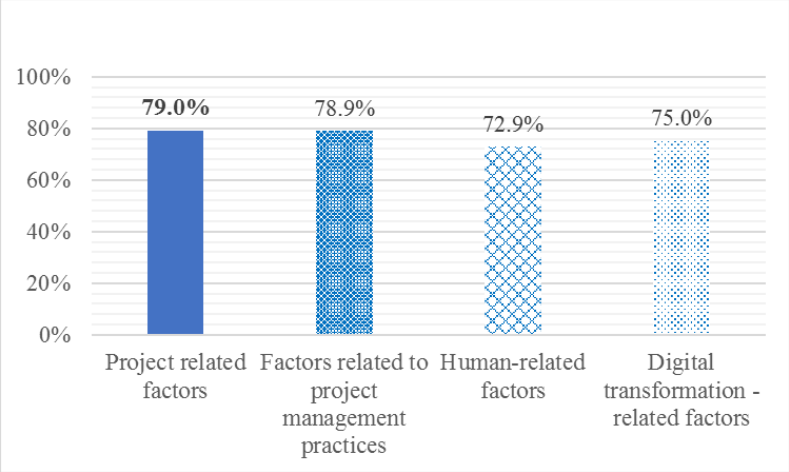

Figure 6 Research Results Data Conclusion

Table 5 Summary of Project Management Competency Categorized by Source

No.	Competency Elements	Sources: Literature Review	Sources: Researcher's Own Enterience	Sources: Semi – structured Interviews	Main Categories
1	Leadership	✓	✓	✓	Skills and characteristics (human-related)
2	Negotiation		✓	✓	
3	University Degree			✓	Education
4	Work Experience	✓	✓	✓	Experience
5	Decision Marking	✓	✓	✓	Skills and characteristics (human-related)
6	Problem Solving	✓	✓	✓	
7	Delegation	✓	✓	✓	
8	Marketing Skill		✓	✓	Skills and characteristics (technical)
9	Technical Expertise		✓	✓	
10	Risk Assessment Skill				

Table 5 Summary of Project Management Competency Categorized by Source (Cont.)

No.	Competency Elements	Sources: Literature Review	Sources: Researcher's Own Enterience	Sources: Semi – structured Interviews	Main Categories
11	Dispute Resolution	✓	✓	✓	Skills and characteristics (human-related)
12	Communication		✓	✓	
13	Goal Orientation	✓	✓	✓	
14	Public Speaking		✓		
15	Accountability		✓	✓	
16	Digital Transformation Management Skill	✓	✓	✓	Skills and characteristics (technical)
17	Procurement Knowledge	✓		✓	
18	Resource Management Skill	✓	✓		
19	Planning and Scheduling Skill	✓			
20	Budgeting Skill		✓	✓	
21	Technology-Related Knowledge				
22	Quality Management Skill	✓			
23	Cross-Sector Working Skills		✓	✓	
24	Professional Certificate	✓			Education
25	Political Awareness	✓			Skills and characteristics (human-related)
26	Team Building	✓	✓	✓	
27	Flexibility		✓	✓	
28	Dedication	✓	✓		
29	Culture Awareness	✓			
30	Absorptive Capacity	✓	✓		
31	Ability to Transfer Knowledge	✓	✓		

Furthermore, project management competencies were indicated by RII value with interesting data noted, in which 91.43% expressed communication skills as the major important skills in Thai UIC projects, followed by negotiation skills, problem solving and decision-making skills.

Discussion and Conclusion

Based on the research results, the adequet resource factors and project management levels are the most relative factors that affect the success of a project, which is counted at a very high significance level. Most of the industries in Thailand comprise SMEs, making up 99.78 percent of companies (The Office of SMEs Promotion, 2017). However, most SMEs still lack the potential for investment in research as identified from interviews and discussion with executives in the industrial sector. Qualitative in-depth interview provides inside information in order to raise the readiness issue with the education sector. For the project initiative, it is easy to proceed in the performance stage due to governmental support and funding. However, when a project is implemented in the subsection of activities in the project, there is still a lack of planning, project details, project role description and project evaluation. There is still ambiguity in responsibility, patent issues, documentation and budgeting work, which results in the delay of project progress and results in project disruption. Furthermore, when a project has a tight time frame to cover, it causes most projects to be at risk of not being able to achieve the project's innovation goals successfully, as defined in the first stage of the collaboration. These can be said that the project with a high level of project management has more possible to access these embedded problems.

Following the second ordering factor, the size of the project and project champions were discussed. Obviously, the nature of the project size has a huge impact on it. Due to the complexity of work break down structure and the number of members, project resources and the difficulty in managing the project are directly adaptable according to the project size. In addition to the UIC project, this factor is also found in projects in the same academic paper (Santoro, & Chakrabarti, 2002; Fontana, Geuna & Matt, 2006). Remarkable points for project competencies in Thai UIC projects include communication skills as a research hypothesis. These prove that Thai UICs tend to extremely overlook these issues, which might be the root of the problem and one that has not been examined in past study.

According to the assumptions of the research that discuss the role of the champion project initially from the viewpoint of Thai university experts, for the industry, the differences in basic knowledge is a problem faced by UIC coordinators who need to have a role in the project. In order to offer understanding of the academic knowledge or specific knowledge from both parties, it must be designated from the education sector.

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Study of Organizational Commitment based on Personality Traits according to the Big Five Model

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Abstract

Organizational commitment and its components are found to be affected by personal characteristics, such as gender, age and nationality. These components include career commitment, career satisfaction, job satisfaction and supervisory support. This study focuses on an investigation into how personality affects organizational commitment using the Big Five Model. The research participants include 163 students from Chiba Institute of Technology, Department of Project Management, and Japanese version of the Big Five was developed based on the English version. Exploratory factor analysis was conducted to ensure the Japanese version is in line with the English version. After data collection and analysis on SPSS, the results showed some differences in the categories of extroversion, agreeableness, conscientiousness and openness, which was dependent on how high or low each factor was, with the exclusion of neuroticism where no differences were found. In addition, the findings indicate that the students found utilitarian benefits to belonging to a university and showed high values for their continuance commitment.

Keywords: Organizational Commitment, Personality Traits, Big Five Model

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Introduction

As of 2018, Japan suffered its biggest recorded population decline according to a number of reports underlining the country's fierce battle to increase the birth rate. Japan's Ministry of Internal Affairs and Communication (2018) announced that there were only an estimated 15.53 million Japanese children under the age of 15, which is troublesome since that figure is 170.000 less than in 2017, and reportedly accounts for a 37-year consecutive decrease since 1982 and is the lowest on record in Japan. Further, the ratio of children out of the total population has also sunk to its lowest point, accounting for 12.3% of the population which alarmingly mark a 44 successive years of decline since 1975. Japan's population growth expanded steadily from about 30 million in the 18th century to the first half of the 19th century, and by 1967 Japan's population exceeded 100 million people. However, Japan's population growth slowed thereafter, with a growth rate of only 1% by the 1980s. Since then, the population has shown signs of sharp decline. In just 5 years between 2010 and 2015, the Japanese population dropped by 962,607 people, the first negative population change rate recorded (Ministry of Internal Affairs and Communication, 2018).

Japan's population over the age of 65 exceeded 10% in 1985, which was seen in other countries, such as France in 1940, Sweden in 1950, Italy in 1965 and the USA in 1975. Yet by 2015, the over-65 population percentage had increased to 26,6%, which exceeds France (18.9%), Sweden (19.6%), Italy (22.4%) and the USA (14.6%). These figures indicate that Japan's population is aging at a considerably faster pace than other developed countries.

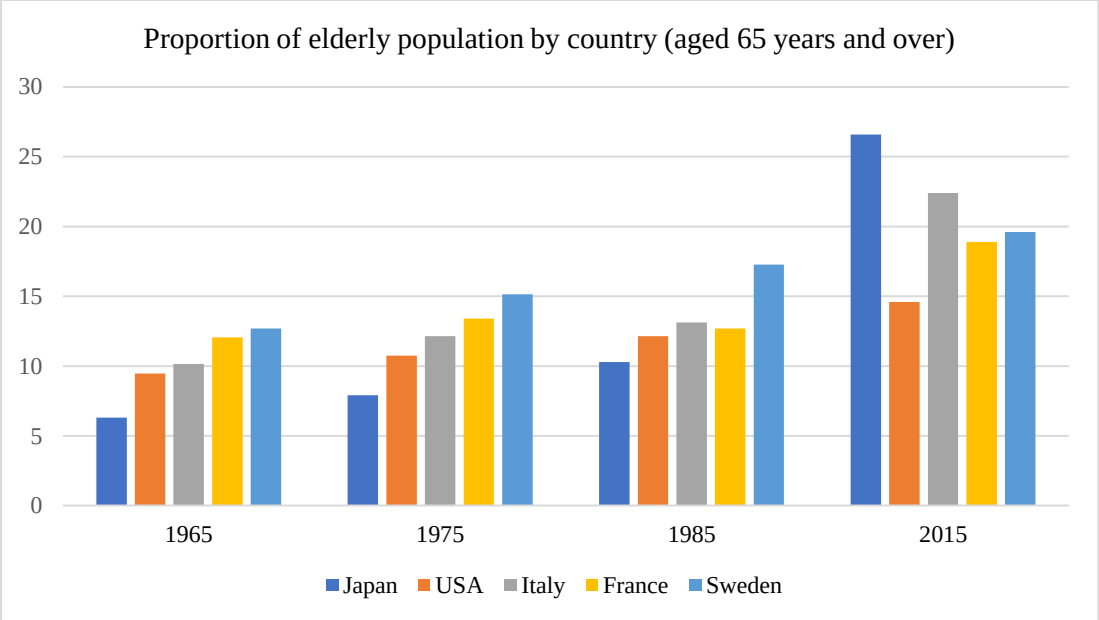

Figure 1 Proportion of elderly population by country (aged 65 years and over)
The World Bank (2017).

As of 1995, the national census reportedly recorded the number of 8.72 million (69.5%), and it is expected to reach 47.9 million in 2060 (51.6%), with a phase of decline, indicating an overwhelming shortage of manpower. Concurrently, such labor shortage is even worse in the case of many firms and companies as developed into a considerable social problem.

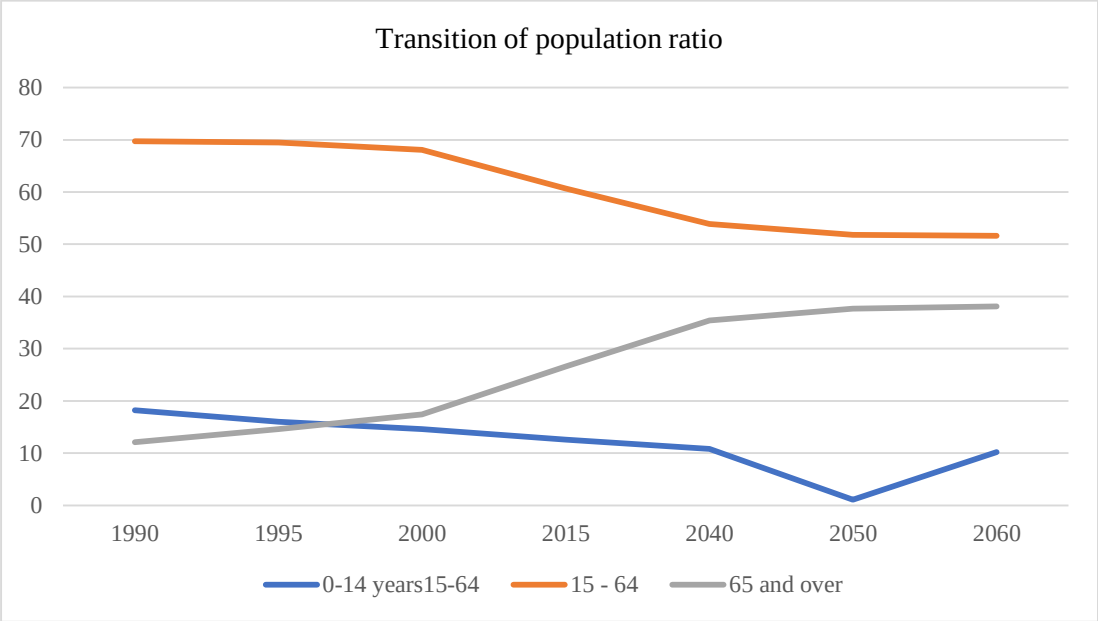

Figure 2 Transition of population ratio

Statistical Bureau, Ministry of Internal Affairs and Communication. Japan (2018).

There is no doubt that human resources are very precious and vital for Japanese firms. In this context, it is necessary to encourage stronger organizational commitment among Japanese organization members. Since the task is not easy but very important, many research has been conducted on the topic. Previous research has shown that organizational commitment is affected by elements, such as gender or national character. Sattavorn (2018) proposed that three psychological aspects have a positive impact on organizational impact and act as indicators. including career satisfaction, career commitment and supervisory.

As younger people's organizational commitment tends to be low, this study examines the relationship between personality traits and organizational commitment among university students. Accordingly, an element of academic satisfaction is added in the questionnaire as a combination of career satisfaction and job satisfaction based on Greenhaus et al. (1990) and Tanaka (1997).

In addition, there have been few studies focusing on organizational commitment and personality traits. Hence, this study will investigate how the personality traits of individuals play a part in affecting organizational commitment, with the support of the well-known Big Five Model.

Organizational commitment

The concept of organizational commitment has received the attention and interest of many authors and scholars. Brown (1996) proposed that the essence of organizational commitment is the idea of continuity of actions by individuals, which considers the factors of stable or unstable situations and feelings. Cohen (2007) delivers a theory of two-dimensional organizational commitment, which is affective and instrumental in nature. Cohen also emphasized the difference in an employee's commitment propensity before entering the organization and their commitment attitude after entering it.

Meyer and Allen (1991) provided another perspective by illustrating three types of organizational commitment: affective commitment, continuance commitment and normative commitment. Affective commitment refers to the degree to which the employee wants to remain at their organization. Affective committed employees feel satisfied and valued and are in line with organizational goals. Continuance commitment is related to the extent to which employees feel they need to remain at the organization. Reasons for such needs often come in the form of a lack of alternative choices or remuneration. However, when a continuance committed employee feels unsatisfied, they may leave the organization. Finally, normative commitment refers to how much an employee feels that they should stay at the organization. This type of commitment is related to psychological aspects since normative committed employees would feel guilty or expect an adverse consequence if they left the organization. Such feelings negatively affect their performance and the well-being employees in the organization.

To summarize, organizational commitment can be defined as the strength and willingness to commit and contribute to the organization values and objectives, and also leave employees determined to achieve such goals while retaining a strong bond and will to be a part of the organization.

While studying the concept of organizational commitment, there are four-important components that must be taken into consideration:

- Career commitment: An emotional concept that identifies a series of related tasks in the working environment and represents the strength of the person's willingness to work in their chosen career role. Career commitment supports the organization's objectives (Iqbal et al., 2014) since higher satisfaction and sense responsibility improves employee productivity within the organization.
- Career satisfaction: This can be defined as the overall affective orientation of an employee toward their chosen career. It is important to note that career satisfaction is different to job satisfaction.
- Job satisfaction: An individual's satisfaction with the single job that they currently hold or most recently held. The term indicates an individual's degree of

satisfaction with their current job without being concerned with the position or status in a previous company.

- Supervisory support: This term demonstrates the relationship between superior and their subordinates. Such supports can come in the form of useful information, feedback, or promotion or development opportunities, and so on.

Manpower shortage has had a significant adverse impact on Japanese companies and organizations. In recent years, low organizational commitments have resulted in increased employee turnover rates. SMEs with small business scales suffer greater damage from manpower shortage, with low productivity, additional and excessive costs, and greater time consumption. Further, insufficient manpower means that the remaining employees must work longer hours and with greater workloads (Barnow, Trutko, Piatak, 2013), which in turns can negatively affect their physical and psychological well-being. The crisis continues to worsen since high turnover rates negatively influence the remaining employees' motivation and commitment. It is therefore important to encourage higher organizational commitment so that organizational members remain attached to the organization, resulting in improved productivity and a stronger motivation.

Table 1 Turnover rate of newly graduated students by size of business (as of March 2015) Ministry of Health, Labor and Welfare (2018).

Business scales	University	Highschool
Over 1000 employees	24.2%（▲0.1Ｐ）	25.3%（±0.0Ｐ）
500 - 999 employees	29.6%（▲0.2Ｐ）	32.9%（±0.0Ｐ）
100 - 499 employees	31.9%（±0.0Ｐ）	36.5%（▲1.4Ｐ）
30 - 99 employees	39.0%（＋0.2Ｐ）	46.3%（▲0.8Ｐ）
5 - 29 employees	49.3%（▲0.9Ｐ）	55.9%（▲0.5Ｐ）
Fewer than 5 employees	57.0%（▲2.1Ｐ）	64.3%（＋0.3Ｐ）

Organizational commitment is also affected by age, with Table 2 showing the turnover rate of junior high school students is double that of university graduate students. The figures also show a progressive result as younger ages have higher turnover rate. Besides, the turnover rate does not show any sign of decreasing and has increased rapidly for a number of consecutive years. Accordingly, those aged 18-25 have the lowest commitment compared to other age groups. This is concerning since low organizational commitment and high turnover rates of younger workers will likely exacerbate Japan's existing labor shortages and ageing population.

Table 2 Turnover rate within three years of employment for new graduates (as of March, 2015) Ministry of Health, Labor and Welfare (2018).

Educational background	Turnover rate	Annual change
University	31.8%	（▲0.4P）
Junior college	41.5%	（+ 0.2P）
Highschool	39.30%	（▲1.5 P）
Junior high school	64.1%	（▲3.6 P）

The Big Five Model

The Big Five Model (Goldberg, 1992) proposed that human characteristics are made up of a combination of five elements: openness, conscientiousness, extraversion, agreeableness, and neuroticism. The model is well-known and considered in Japan.

Wada (1996) created a Japanese version of the Big Five Model based on the English version of the questionnaire. At that time, there was a problem in term of language interpretation from English to Japanese that some words might provide different meaning or nuance. For instance, conscientiousness, which is a Big Five item, translates directly into conscience or honesty in Japanese. Furthermore, while "sincere" in Japanese has an interpersonal meaning, the intrinsic meaning of this factor is only within the individual, and containing the meaning of becoming honest, poses the characteristics of seriousness and willpower. Therefore, the Japanese version was not a direct copy of the English version and was written out with appropriate translated terms, excluded duplicate, and created a questionnaire. Since it is unknown whether the Japanese version of the Big Five Model is in line with the English version, exploratory factor analysis was undertaken in Survey 1 of her study. Consequently, five factors that correspond to the Big Five were obtained. The author then conducted a second stage survey to confirm the Survey 1 in case where the rating point changes. This stage used the five-point method that had 130 items of the new personality test in addition to the 78 items used in Survey 1. Interestingly, the results showed that the same five factors as Survey 1 could be confirmed even if the number of points for evaluation was different. This result confirmed the Japanese version of the Big Five terms.

Next, factor analysis of the 12 scales of the Big Five scale and the new personality test showed that each scale was highly reliable. Table 3 show 12 scales, which are personality tests that measure over the Big Five. The nervousness scale, depression scale, and inferiority scale all corresponded to Big Five-N, while the extroversion scale, and the activity scale corresponded to the Big Five-E. Further, the aggression scale, non-cooperation scale, and empathy scale corresponded to the Big Five-A. Meanwhile, the acceptability measure and the self-representation measure corresponded to the Big Five-O, and the endurance measure and

the discipline measure corresponded to the Big Five-C. As the analysis delivered a corresponding and similar result, the Big Five was confirmed.

Table 3 Factor analysis of the Big Five scale and the new personality test 12 scale

	F1	F2	F3	F4	F5	α
BFS-E	-199	**821**	-069	028	-041	905
BFS-N	**936**	109	024	-110	-003	918
BFS-O	-113	039	006	**715**	155	860
BFS-C	000	-036	-070	-115	**924**	877
BFS-A	-032	032	**-783**	049	031	844
Social extroversion	-028	**915**	-076	-053	-076	856
Activity	-020	**603**	151	237	216	793
Sympathy	327	**449**	**-546**	150	-009	782
Enterability	005	-028	-067	**879**	-169	812
Endurance	059	-036	-232	313	**544**	813
Discipline	070	012	109	-078	**763**	757
Self-explanatory	128	**397**	212	**394**	-087	807
Aggression	134	250	**813**	034	-027	793
Uncooperative	150	-276	**561**	117	026	753
Inferiority	**466**	-203	-102	-268	-240	813
Nervous	**854**	-014	050	-032	214	851
Depressive	**712**	-221	097	183	-078	828
Emotional instability	1000		Correlation between factors			
Extroversion	-216	1000				
Harmony	272	-133	1000			
Openness	024	**481**	071	1000		
Integrity	-104	245	-232	273	1000	

Research purpose

The purpose of this study is to examine how personality traits affect organizational commitment using the Big Five Model, which consists of five elements: Extraversion, conscientiousness, openness, agreeableness, and neuroticism. In addition, the subscale of organizational commitment, career commitment, academic satisfaction and supervisory support are investigated to explore the effect of personality traits.

Methodology

The research was conducted using a web-based questionnaire system based on the 7-point Likert scale. The participants included 163 students from Chiba Institute of Technology, Department of Project Management. The questionnaire focused on organizational commitment, career commitment, academic satisfaction, supervisory support, and the Big Five Model which were developed and delivered to collect data to ensure a more proficient investigation. Moreover, several analyses were also performed on SPSS to determine the correlation between personality traits and organizational commitment, as well as the main driving factor(s).

The questionnaire was developed as follow:

- Organizational commitment: 14 items were extracted from the organizational commitment questionnaire (OCQ) developed by Porter, Mowday and Steers (1979).
- Supervisory support: 8 items based on Greenhaus (1990).
- Career commitment: 8 items were extracted from of Blau (1985).
- Academic satisfaction: A combination of 4 items from Greenhaus's (1990) career satisfaction questionnaire and 4 items from Tanaka's (1997) job satisfaction questionnaire.
- Big Five Model: 10 items from the Japanese version of the Ten Item Personality Inventory (TIPI-J) (Koshio, 2012).

According to the results from factor analysis, 27 variables were selected from a total of 38 including organizational commitment, supervisory support, career commitment and career satisfaction, while items were excluded with a commonality 0.1 or less and the validity of factor loadings. The findings provided a simple structure by maximum likelihood promax rotation. The Kaiser-Meyer-Olkin's measure of sample validity scored 0.912, which is proven to be a highly reliable factor analysis.

The elements of the Big Five questionnaire were evaluated by the 7-point Likert scale. The average value from 1 to 3.5 was considered low, whereas the range from 4.5 to 7 was considered high. Meanwhile, the average value of 4 was shown to be neutral; therefore, it was excluded to classify the Big Five high and low factors of each category. Further, the correlation with the extracted factors was proven by the scatter chart.

Results

Factor analysis provided a simple structure obtained by the promax rotation of the maximum likelihood estimation of the 27 variables, the exclusion of variables with a commonality 0.1 or less, and the factor validity assessment. Furthermore, a fifth factor was

extracted out of the total of 38 factors. The eigenvalue was reported to be 1 or higher and was subsequently adopted.

The first factor is referred to as the "supervisory support" since it focuses on the support provided by the superior, for instance "teacher's advice on the choices in life". The second factor are emotions toward the university, such as (34) "I am happy to enroll in this university rather than other universities", or (21) "I like this university very much". Accordingly, this factor was termed "emotional attachment". The third factor was defined as "future oriented" due to the inclusion of the future in all the questions. For example, (22) "this university is an ideal option for future employment". The fourth factor consisted of synonymous questions to recognize both self-beliefs and universal beliefs, (25) "I will try my best to help this university succeed" or (36) "I am concerned about the future of the university" and was known as the "internalization". Finally, the fifth factor was referred to as the "continuance commitment" as it focused on commitment that considers utilitarian aspects of universities, such as "If I can start over, I will not decide to get into the university".

Figure 3 shows the difference between supervisory support and emotional attachment in term of cooperation. There was a positive correlation between the highly cooperative group and the low group, but the findings proved that the low cooperativeness of both supervisory support and emotional attachment were underwhelming. Since individuals with low cooperativeness do not cooperate with others, they neither create a strong relationship with their superiors nor increase their emotional attachment to the university. Both supervisory and emotional attachment achieved low values.

Figure 3 Cooperativeness in terms of Supervisory Support and Emotional Attachment

In Figure 4, highly cooperative individuals were scattered thoroughly, whereas those with low cooperativeness had low values in terms of both future-orientation and internalization. Low cooperative individuals consider their beliefs and values separately from the university as they do not treasure harmony. Therefore, internalization is low and no prospects for the future were found. Hence, both future oriented and internalization achieved low values.

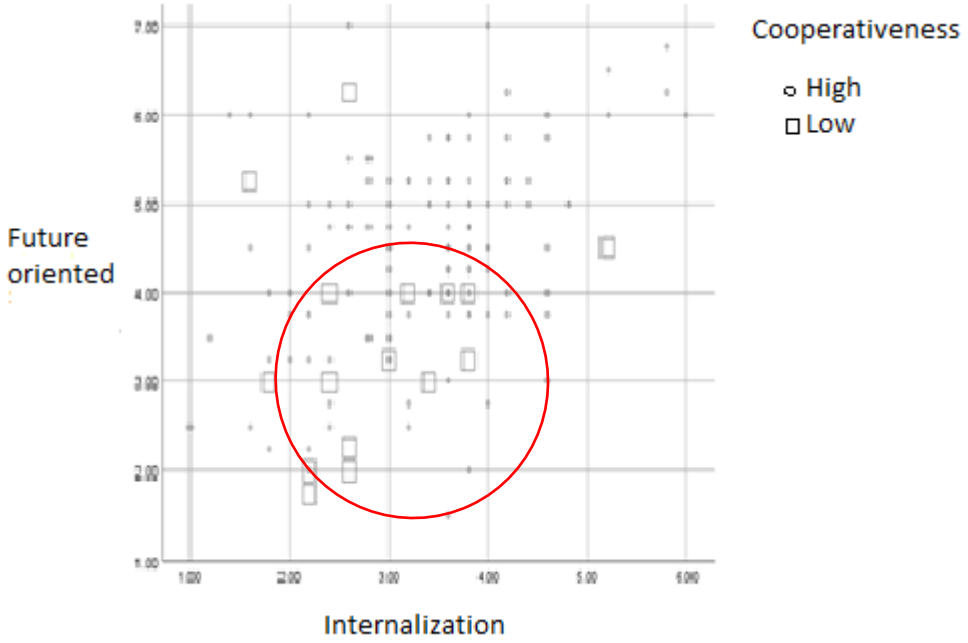

Figure 4 Cooperativeness in Relation to Future Orientation and Internalization

Figure 5 highlights that there were differences between future orientation and continuance commitment by diligence. Individuals with low diligence were dispersed among those with high continuance commitment, whereas individuals with high diligence were scattered with high positions in terms of future orientation and continuance commitment. Highly diligent individuals possessed a strong future-oriented mindset and highly persistent commitment to study by themselves at the university.

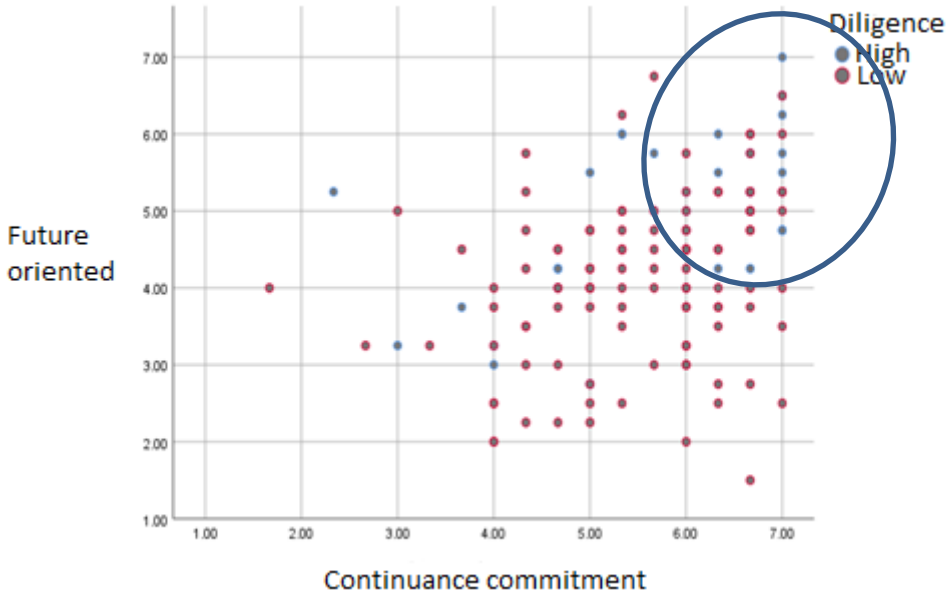

Figure 5 Diligence in Relation to Future Orientation and Continuance Commitment

Figure 6 indicates that there was a difference between emotional attachment and internalization in terms of openness. Highly openness individuals were totally dispersed, but individuals with low openness were positively correlated with internalization. It appears that the reason for internalization being decentralized is because many people with high levels of openness have their own values and originality, and so tend to consider their own beliefs and the university's educational policies separately. In addition, people with high openness are considered as being separated from emotional attachment because they are not confined to the organization of university. On the contrary, people with low openness seem to have a positive correlation with emotional attachment because their attachment to the university is higher because their convictions and the university's educational policy are more consistent.

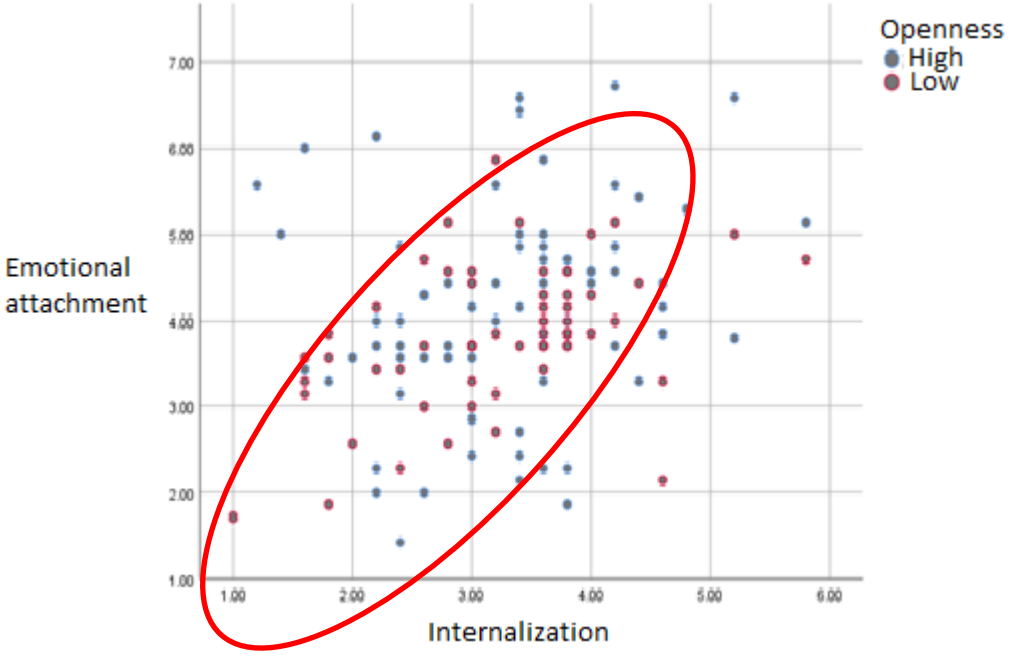

Figure 6 Openness in Relation to Emotional Attachment and Internalization

Conclusion

The project is based on the effects of personality traits on organizational commitment. This research conducted a survey based on the Big Five theory, although there were some differences as follows:

- Extroversion: Highly extroverted individuals score high in the aspect of emotional attachment. The reason is that they capture things by emotions rather than considering utilitarian and normative aspects.
- Cooperativeness: This is the most remarkable finding of this research, which indicated that individuals with low cooperativeness possess low levels of emotional attachment, superior support and future orientation. It appears that Japan's unique culture of cherishing harmony may have influenced this in some way.
- Diligence: Individuals that were highly diligent are also highly future-oriented. Highly diligent people were found to be ambitious and have high expectations for the future, meaning that their future orientation is high.
- Neuroticism: No difference was found between individuals with high or low neuroticism.
- Openness: People with high levels of openness tended to disperse widely in internalization. Highly open individuals were found to be creative and tend to separate the university philosophy and convictions with their own convictions.

Discussion

Younger generations were found to adhere to their beliefs. Since the participants in the present study are students at a private educational institution rather than belonging to a company, there may be some differences between the corporate philosophy and educational policy of an actual company. Overall, the fifth factor of continuance commitment tended to be high, which is directly linked to salary ranges which in Japan are dependent on having bachelor's degree, and also greatly affect the range of work that can be undertaken. Interestingly, this seems to be a result of Japanese culture. Therefore, these individuals found utilitarian aspects in belonging to a university and showed high values for their continuance commitments.

Future Study

In the future, this research aims to further investigate the influence of other variables on organizational commitment which have not yet been covered by the present project. Moreover, based on this project, it is also important to examine the differences in effects on organizational commitment when comparing the academic university environment to a company or organization.

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The Extension Programs of Camarines Sur Polytechnic Colleges: An Impact Study

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Abstract

This descriptive research study aimed to assess the effectiveness of the extension programs of Camarines Sur Polytechnic Colleges (CSPC) in different partner barangays and communities in the Rinconada Area in Camarines Sur, Philippines. Relevant data to the study were gathered using questionnaire and unstructured interview. There were 245 respondents or 62% of the 395 total number of respondents. Weighted Mean and Spearman Rank Order of Correlation were the statistical tools used in the study. Findings revealed that level of administrative capability of the CSPC Extension Services in terms of leadership capability, personnel and staff capability and financial capability were rated as satisfactory. Likewise, the extent of participation of the local/barangay officials, government agencies, and community people were rated as satisfactory. The extent of implementation of the extension program of CSPC, as perceived by the respondents in terms of level of attainment of objectives and level of execution of the criteria in the selection of service area for extension services program were also rated as satisfactory. Results further revealed that the level of program outputs of the Extension Services in terms of skills training, health education services, computer literacy, advocacy programs and livelihood programs were satisfactory. And the economic and social impacts of the Extension Services were likewise rated as satisfactory. Further, significant relationship between the level of program outputs and impact of the program manifested that only computer literacy appeared to have no significant relationship as to the economic impact and level of program outputs and that on the other hand, the skills training and computer literacy, both interpreted to have no significant relationship between social impacts and level of program outputs. The economic and social impacts of the program of CSPC Extension Services should be improved along with the delivery of a more sustainable extension programs to partner agencies and communities.

Keywords: Extension Services, Camarines Sur Polytechnic Colleges, Partner Barangays, Program Outputs, Impact of Extension Programs

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Introduction

Extension and community involvement is the key result area which makes the community feel the presence of the institution. It serves as the link between the College and the community. It is the avenue where higher educational institution extends its expertise in line with its programs. It shares the transfer of technology and other extension programs which would assist to alleviate the economic status of its beneficiaries. This extension and linkages are not only intended for the community outside the campus, but they are done also within the campus of the institution itself. Extension programs and projects must be responsive to the needs of the target clienteles and must be supportive of the ten-point agenda of the government and the medium-term regional development plan of the Bicol Region specifically on poverty alleviation.

The Camarines Sur Polytechnic Colleges in its Comprehensive Development Plan 2K8-17, envision in promoting the conduct of relevant extension and community involvement thru its varied programs, projects and activities to let the community it serves feel its presence. As a public state higher educational institution, the College endeavors to ensure that implementation of a research-based extension program shall enhance the livelihood and entrepreneurial capability of the target clientele for improved quality of life.

As one of the mandated functions of State College and Universities highlighted in the 10-year Strategic Plan 2019-2028, the Extension Services Office through its flagship program dubbed as CSPC CARES Community Assistantship thru Responsive Entrepreneurial Skills portrays its mission and vision that is to get in touch to those less fortunate through provision of skills training; technology transfer, advocacy programs and information drive that they could live better and become partners of development. The extension programs started their noble vision by building, forming and organizing communities from the different municipalities of the 5th district of Camarines Sur or the Rinconada. These are being accomplished through skills training and technology transfer like: automotive and driving, refrigeration and air conditioning, building wiring and trouble shooting, basic welding and metal-craft, carpentry, radio mechanics, plumbing, dressmaking, food processing, baking and commercial cooking, computer literacy and programming, and advocacy programs among others.

The College appreciates the support of the Local Government Unit to this endeavor though a collaborative partnership to bring a unified direction to improve the quality of life in the depressed and underserved barangays. These extension programs are sustainably implemented through the coordination and collaboration with the LGU partner which is usually done through a Memorandum of Agreement for the Adopt-A-Community and School Program as approved by the Board of Trustees of the College.

Moreover, with the given parameters of identified standards in the evaluation of curricular programs by Accrediting Agency of Chartered Colleges and Universities in the Philippines, (AACCUP) Inc., International Organization for Standardization (ISO), Institutional Sustainability Assessment (ISA), and Institutional Accreditation (IA), the intensification of the extension services programs and activities bringing about total human development geared towards the empowerment of the clientele making them self-reliant, independent and capacitated in the form of technology transfer must be evident and effective.

The Extension Services Office of the College has been continuously implementing different programs and projects in the Fifth District of the Province of Camarines Sur. It is for this reason that the researcher wishes to assess the effectiveness of the extension programs and projects to be implemented in order to strengthen weaknesses if there are any areas that need improvement which may be identified in this study with the aim to properly address the needs of the community people that the College served.

Objectives of the Study

This study focused on the assessment of the effectiveness of the extension program of the College. Specifically, it aimed to determine the level of administrative capability of the extension services, to know the extent of participation of development partners in extension services, to determine the extent of implementation of the extension programs of CSPC, to know the level of program outputs and the economic and social impacts of the extension programs, to analyze whether there is any significant relationship between the level of program outputs and impact of the program and to come up with proposed recommendations to enhance and sustain the effectiveness of CSPC extension services.

Review of Literature

The information from the literatures and studies provided the researcher with wide range of ideas and insights that play significant roles in the conduct of this research.

The educational system as mandated by Philippine Constitution, shall reach out to educationally deprived communities in order to give meaningful reality to their membership in national society and finally enrich their civic participation in program undertaking. (De Leon, 2008).

One of the development agenda of CSPC's Comprehensive Development Plan 2k8-17 is to promote the conduct of relevant extension and community involvement programs and activities to let the community feel the presence of CSPC. (CSPC, 2008).

Buemio (2006) studied the Community Extension Program of Saint Paul College of Ilocos Sur. The silent findings include the following: SPCIS is an institution headed by an administrator with a "Very High" Leadership capability; along executive leadership, the

respondents as evidenced by the mean rating of 4.44, showed a "Very High" perception. Based on the findings, she concluded that the school has a remarkable agenda along extension services as shown in the administrative capability, the professional and personal characteristics of implementers, and in the participation of development partners. The overall implementation of the program was significantly influenced by administrative capability and executive leadership of having remarkable agenda along extension services, clear goals and objectives, effective planning, implementation, monitoring and evaluation of the program. The economic, socio-cultural, and personal aspects are significant factors in the overall impact of the extension programs.

On the research paper by Gonzales and Maghamil (2009), the study focused on the beliefs of the faculty that the extension program has enhanced their skills as teachers and turned them into service-oriented individuals. This study was more on the side of partners in development who are directly involved with the community extension programs.

According to Herrera (2010), the results showed that being represented by the seven colleges and the Graduate School was socially responsive to the needs and sincere in its role of uplifting the quality of life of the residents of village Lumbocan. The findings further confirmed the importance of students to realize their experiential learning that transforms them to become humane individuals who, together with coordinators and volunteers, are committed to be part of the extension program of the institution.

Methodology

The research utilized the descriptive survey method of research. It was used to describe and analyze the existing situation concerning the effectiveness of the extension programs of the College. In order to collect pertinent data for the study, the researcher made use of a questionnaire and documentary analysis. Furthermore, unstructured interview was also conducted for clarification and validation of their responses in the questionnaire. There were 395 identified beneficiaries who were given questionnaires; however, only 245 or 62% of them were retrieved and used in this study. Weighted Mean and Spearman Rank Order of Correlation were the statistical tools used in the study.

Research Results

1. Level of administrative capability of the CSPC Extension Services

Table 1, 2 and 3 reveal the level of administrative capability of the CSPC Extension Services in terms of leadership capability, personnel and staff capability and financial capability.

Table 1 shows the leadership capability of the CSPC Extension Services. Overall, leadership capability was rated as satisfactory with WM of 3.48. This clearly shows that

through the leadership capability of the extension officials, extension plans, programs and activities of the College are felt by the respondents. These findings can be validated in the study of Buemio (2006) which also dealt on some similar parameters particularly on leadership capability.

Table 1 Leadership Capability of the CSPC Extension Services

Leadership Capability	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. The College has a remarkable agenda on extension program.	3.37	3.31	3.48	3.74	3.50	3.64	**3.51**	**VS**
2. The goals and objectives of Extension are clearly stated and understood.	3.42	3.17	3.27	3.77	3.50	3.64	**3.46**	**S**
3. The extension officials supervise the implementation of the plans, programs and activities.	3.47	3.24	3.53	3.68	3.50	3.55	**3.49**	**S**
4. The extension officials monitor and evaluate the conduct of the extension programs to the clientele.	3.42	3.19	3.41	3.65	3.50	3.55	**3.45**	**S**
5. The extension office is able to implement its plans, programs and activities.	3.42	3.19	3.49	3.68	3.50	3.55	**3.47**	**S**
6. The administration has remarkable ability to forge linkages with the LGU's, National Agencies and the Community.	3.42	3.35	3.29	3.74	3.50	3.55	**3.48**	**S**
7. The officials initiate the organization of the graduates/ completers into functional associations and adaptors of the technology.	3.37	3.25	3.45	3.71	3.50	3.55	**3.47**	**S**
8. The administration adopts an established system to make the conduct of extension projects continuing and sustainable.	3.21	3.43	3.46	3.77	3.50	3.55	**3.49**	**S**
Average Weighted Mean	**3.39**	**3.27**	**3.42**	**3.72**	**3.50**	**3.57**	**3.48**	**S**

Table 2 shows the personnel and staff capability of the College Extension Services which registered various responses. Evidently, the overall AVM of this aspect registered 3.48 whose verbal interpretation is satisfactory (S).

Table 2 Personnel and Staff Capability of the CSPC Extension Services

Personnel and Staff Capability	**San Isidro**	**La Purisima**	**San Roque**	**Salay**	**Lourdes**	**Sta. Justina**	**Overall**	
	WM	**WM**	**WM**	**WM**	**WM**	**WM**	**WM**	**VI**
1. The extensionists possess required educational attainment and training fit for the job.	3.26	3.33	3.45	3.71	3.47	3.64	**3.48**	**S**
2. They establish good rapport with the clients.	3.26	3.40	3.37	3.74	3.47	3.64	**3.48**	**S**
3. They initiate new ideas for the development of the community and other partner agencies.	3.26	3.29	3.54	3.68	3.47	3.55	**3.46**	**S**
4. The extension coordinators and staff have good facilitation skills.	3.32	3.20	3.56	3.71	3.47	3.55	**3.47**	**S**
5. They meet their classes regularly within the duration of the activity.	3.26	3.34	3.19	3.71	3.47	3.64	**3.43**	**S**
6. They monitor and evaluate their classes after the completion of the activity.	3.32	3.62	3.40	3.74	3.47	3.64	**3.53**	**VS**
7. The faculty and student extensionists are actively involved in extension activities.	3.42	3.40	3.41	3.77	3.47	3.64	**3.52**	**VS**
8. There is a pool of consultants/experts from various disciplines to serve in special extension projects.	3.26	3.34	3.42	3.77	3.47	3.64	**3.48**	**S**
Average Weighted Mean	**3.30**	**3.37**	**3.42**	**3.73**	**3.47**	**3.61**	**3.48**	**S**

Table 3 shows the financial capability of the extension services. It shows that the overall average weighted mean of 3.47, interpreted as satisfactory (S). This implies that the College is financially capable in terms of extension services involved.

Table 3 Financial Capability of the CSPC Extension Services

Financial Capability	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. There is an approved annual budgetary allocation for extension services.	3.26	3.28	3.44	3.74	3.53	3.64	**3.48**	**S**
2. The budget for the extension programs is adequate.	3.26	2.84	3.42	3.71	3.53	3.64	**3.40**	**S**
3. Training funds for the clientele are sufficient.	3.37	3.20	3.48	3.74	3.56	3.64	**3.50**	**VS**
4. The funds are properly utilized as proposed/ planned.	3.26	3.22	3.18	3.68	3.56	3.64	**3.42**	**S**
5. The College sources out additional funding from partner agency.	3.16	3.20	3.38	3.74	3.56	3.64	**3.45**	**S**
6. The College sources out technical assistance and service inputs from other agencies which are allotted budget in the project.	3.26	3.32	3.40	3.71	3.56	3.64	**3.48**	**S**
7. The funds are properly liquidated on time.	3.32	3.06	3.61	3.71	3.56	3.64	**3.48**	**S**
8. Financial report is timely submitted with a terminal report.	3.26	3.42	3.53	3.74	3.56	3.64	**3.52**	**VS**
Average Weighted Mean	**3.27**	**3.19**	**3.43**	**3.72**	**3.55**	**3.64**	**3.47**	**S**

2. Extent of participation of the different development partners in CSPC Extension

Table 4, 5 and 6 shows the extent of participation of the local/barangay officials, government agencies and community people as development partners in CSPC extension services. According to Herrera (2010), the importance of students together with coordinators and volunteers was confirmed to realize their experiential learning which transforms them to

become humane individuals and to be strongly committed as parts of humane extension program.

Table 4 shows the extent of participation of the local/barangay officials as development partners in CSPC extension services. Findings revealed that the overall extent of participation of the barangay officials on six (6) barangays registered an average weighted mean of 3.52 with an interpretation of very satisfactory (VS).

Table 4 Extent of Participation of the Local/Barangay Officials in CSPC Extension Services

Local/Barangay Officials	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. They enter into Memorandum of Agreement/Understanding with the College.	3.50	3.43	3.65	3.77	3.53	3.55	**3.57**	**VS**
2. They attend consultative meeting, orientation seminars and related programs and activities conducted by the extension office.	3.56	3.48	3.62	3.77	3.53	3.55	**3.58**	**VS**
3. They assist in the conduct of survey on the problems, needs and resources of the community.	3.44	3.37	3.57	3.77	3.53	3.55	**3.54**	**VS**
4. They help facilitate extension services by informing residents about meeting and other extension-related activities.	3.50	3.44	3.33	3.77	3.53	3.55	**3.52**	**VS**
5. They provide facilities, supplies and materials, and other resources as their counterpart being developmental partners.	3.39	3.04	3.19	3.74	3.53	3.55	**3.41**	**S**
6. They assist in the monitoring of attendance and involvement of the clientele.	3.39	3.26	3.51	3.74	3.53	3.64	**3.51**	**VS**
Average Weighted Mean	**3.46**	**3.34**	**3.48**	**3.76**	**3.53**	**3.56**	**3.52**	**VS**

Table 5 shows the extent of participation of the government agencies as development partners in CSPC extension services. Findings revealed that the overall extent of participation of the barangay officials on six (6) barangays registered an average weighted mean of 3.49 with an interpretation of satisfactory (S).

Table 5 Extent of Participation of the Government Agencies in CSPC Extension Services

Government Agencies	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. Government agencies enter into Memorandum of Agreement/Understanding with the College.	3.33	3.50	3.46	3.74	3.53	3.64	**3.53**	**VS**
2. They help the extension services by providing manpower when needed to discharge extension programs, projects and activities.	3.44	3.46	3.41	3.77	3.53	3.55	**3.53**	**VS**
3. They provide the extension office pertinent document needed to facilitate better extension services.	3.33	3.28	3.37	3.74	3.53	3.64	**3.48**	**S**
4. They source out funds, materials and other service inputs.	3.44	3.08	3.36	3.74	3.53	3.64	**3.47**	**S**
5. They assist in the monitoring of attendance and involvement of the clientele.	3.39	3.12	3.50	3.71	3.53	3.64	**3.48**	**S**
6. They assist in the deployment of the clientele and/or completers.	3.28	3.19	3.17	3.74	3.53	3.64	**3.42**	**S**
Average Weighted Mean	**3.37**	**3.27**	**3.38**	**3.74**	**3.53**	**3.62**	**3.49**	**S**

Table 6 shows the extent of participation of the community people as development partners in CSPC extension services. Overall weighted mean of the extent of participation of the community people as development partners in CSPC extension services registered a rating of 3.44 with an interpretation of satisfactory (S).

Table 6 Extent of Participation of the Community People in CSPC Extension Services

Community People	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. CSPC-Extension Services Office coordinates its community programs and services with the target clientele.	3.17	3.44	3.37	3.77	3.53	3.55	**3.47**	**S**
2. There is community participation and involvement in extension activities in planning, implementation and dissemination.	3.22	3.29	3.08	3.71	3.53	3.64	**3.41**	**S**
3. They participate in seminars, programs and activities conducted by the extension staff.	3.28	3.40	3.21	3.77	3.53	3.64	**3.47**	**S**
4. They are involved in out-sourcing of funds, materials and other service inputs.	3.00	3.24	3.18	3.74	3.53	3.55	**3.37**	**S**
5. They participate in the utilization of technology, knowledge learned, skills acquired from the extension projects and activities.	3.28	3.32	3.31	3.71	3.53	3.55	**3.45**	**S**
6. There is a wholesome coordination between the College Extension Program Implementers and the Community.	3.22	3.47	3.34	3.74	3.53	3.55	**3.48**	**S**
Average Weighted Mean	**3.19**	**3.36**	**3.25**	**3.74**	**3.53**	**3.58**	**3.44**	**S**

3. The Extent of implementation of the extension program of CSPC, as perceived by the respondents

Table 7 and 8 reveals the extent of implementation of the extension program of CSPC, as perceived by the respondents. The benefits of participating in the implemented extension programs were given emphasis in the study of Bidad and Campiseño (2010). This was made through the various extension projects and activities.

Table 7 shows the implementation of the extension program of CSPC in terms of level of attainment of objectives as perceived by the respondents. Data shows that the total general average weighted mean of 3.47 aggressively interpreted as satisfactory (S).

Table 7 Extent of Implementation of CSPC Extension Program in terms of Level of Attainment of Objectives

Level of Attainment of Objectives	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. The extension programs addressed the needs and problems of the community.	3.33	3.34	3.53	3.77	3.53	3.45	3.49	S
2. The extension programs and activities served varied clientele or groups.	3.33	3.18	3.32	3.84	3.53	3.45	3.44	S
3. Concerned stakeholders are involved in the organization of extension programs.	3.33	3.42	3.29	3.84	3.53	3.45	3.48	S
4. The allotted budget for extension programs and activities is sufficient.	3.39	3.24	3.41	3.81	3.53	3.45	3.47	S
5. The College is committed to the service and development of the community.	3.28	3.28	3.34	3.84	3.53	3.45	3.45	S
6. There is community participation and involvement in extension activities along utilization of technology/knowledge/skills learned or acquired.	3.17	3.48	3.44	3.84	3.53	3.45	3.49	S
Average Weighted Mean	**3.31**	**3.32**	**3.39**	**3.82**	**3.53**	**3.45**	**3.47**	**S**

Table 8 shows the extent of implementation of the extension program of CSPC in terms of level of execution of the criteria in the selection of service area for extension services as perceived by the respondents. Data registered a total general average weighted mean of 3.48 which is interpreted as satisfactory (S).

Table 8 Extent of Implementation of CSPC Extension Program in terms of Level of Execution of the Criteria in the Selection of Service Area for Extension Services

Level of Execution	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. Demand-driven and people's initiative.	3.39	3.20	3.27	3.77	3.56	3.45	3.44	S
2. Socio-economic situation.	3.44	3.12	3.18	3.77	3.56	3.45	3.42	S
3. Support of Local Government Unit.	3.56	3.32	3.46	3.77	3.56	3.45	3.52	VS
4. Acceptability of Extension Projects/ Services.	3.56	3.40	3.49	3.77	3.56	3.45	3.54	VS
5. Prospects of sustainability.	3.50	3.28	3.32	3.77	3.56	3.45	3.48	S
6. Partnership with National Government Agencies.	3.50	3.26	3.46	3.77	3.56	3.45	3.50	VS
Average Weighted Mean	**3.49**	**3.26**	**3.36**	**3.77**	**3.56**	**3.45**	**3.48**	**S**

4. Level of program outputs of the CSPC Extension Services

Table 9, 10, 11, 12 and 13 revealed the level of program outputs of the CSPC extension services in terms of skills training, health education services, computer literacy, advocacy programs and livelihood programs. Similar extension activities were also provided in the study of Bidad and Campiseño (2010). According to their study, problems were encountered during the implementation of the extension activities.

a. Skills Training

Reflected in the Table 9 is the level of program outputs of the CSPC extension services in terms of skills training. The results show that the sub-average weighted mean for San Isidro is 3.29 which is interpreted as satisfactory (S); La Purisima with a weighted mean of 3.28 is also interpreted as satisfactory (S) and San Roque with a weighted mean of 3.34 which is likewise interpreted as satisfactory (S). On the other hand, Salay has an average mean of 3.87 which is interpreted as very satisfactory; Lourdes has an AWM of 3.58 with an interpretation of very satisfactory (VS), and Sta. Justina has an AWM of 3.55 with the same interpretation of very satisfactory (VS). Along this aspect, the overall weighted mean is 3.48 with verbal interpretation of satisfactory (S). The data gathered shows the awareness of the community in various skills trainings conducted by the College.

Table 9 Level of Program Outputs of the CSPC Extension Services in terms of Skills Training

Skills Training	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. The skills learned are effective in my profession.	3.39	3.50	3.40	3.87	3.56	3.55	**3.55**	**S**
2. The skills taught helped me increase my income.	3.28	3.24	3.37	3.87	3.56	3.55	**3.48**	**S**
3. The skills I learned improved my self-esteem.	3.39	3.35	3.38	3.87	3.56	3.55	**3.52**	**VS**
4. I have taught other people of the skills I learned.	3.37	3.29	3.38	3.87	3.59	3.55	**3.51**	**VS**
5. I became gainfully employed after the training.	3.16	3.13	3.18	3.87	3.59	3.55	**3.41**	**S**
6. I adopted the technology I learned.	3.26	3.24	3.41	3.87	3.59	3.55	**3.49**	**S**
7. I started my own business after the training.	3.21	3.19	3.26	3.87	3.59	3.55	**3.44**	**S**
Average Weighted Mean	**3.29**	**3.28**	**3.34**	**3.87**	**3.58**	**3.55**	**3.48**	**S**

b. Health Education Services

Table 10 shows the perception of the respondents along the level of program outputs of CSPC extension services in terms of health education. Along this parameter, the average weighted mean is 3.48 with verbal interpretation of satisfactory (S).

Table 10 Level of Program Outputs of the CSPC Extension Services in terms of Health Education Services

Health Education	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. The knowledge and attitude I learned are relevant and effective.	3.37	3.39	3.24	3.90	3.59	3.45	**3.49**	**S**
2. The concepts and skills taught me are timely.	3.42	3.20	3.25	3.90	3.59	3.45	**3.47**	**S**
3. The knowledge I learned improved my self-esteem.	3.47	2.92	3.33	3.90	3.59	3.45	**3.45**	**S**
4. I have taught other people the knowledge I learned.	3.47	3.27	3.33	3.90	3.59	3.45	**3.50**	**VS**

Table 10 Level of Program Outputs of the CSPC Extension Services in terms of Health Education Services (Cont.)

Health Education	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
5. I disseminated the knowledge the knowledge and information to other community.	3.32	3.27	3.29	3.90	3.59	3.45	**3.47**	**S**
6. I applied the knowledge I learned.	3.47	3.35	3.19	3.90	3.59	3.45	**3.49**	**S**
Average Weighted Mean	**3.42**	**3.23**	**3.27**	**3.90**	**3.59**	**3.45**	**3.48**	**S**

c. Computer Literacy

Table 11 shows the level of program outputs of the CSPC extension services in terms of computer literacy. Along this parameter, the overall weighted mean is 3.36 with verbal interpretation of satisfactory (S). The College has also conducted computer literacy programs/ trainings which are designed according to the demands and addressed need of various partner barangays. Among the computer literacy program conducted by the College was the computer literacy with troubleshooting and repair.

Table 11 Level of Program Outputs of the CSPC Extension Services in terms of Computer Literacy

Computer Literacy	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. I learned new knowledge and information in computer technologies.	3.21	3.22	3.36	3.48	3.63	3.36	**3.38**	**S**
2. It greatly developed my computer skills.	3.21	3.27	3.28	3.48	3.63	3.36	**3.37**	**S**
3. It improved my computer skills required of my job.	3.16	3.17	3.30	3.48	3.63	3.36	**3.35**	**S**
4. The concept and skills I learned contributed to a better work performance.	3.37	3.13	3.19	3.48	3.63	3.36	**3.36**	**S**
5. It developed my self-esteem.	3.26	3.08	3.33	3.52	3.63	3.36	**3.36**	**S**
6. I adopted the technology I learned.	3.32	2.98	3.08	3.52	3.63	3.36	**3.31**	**S**
Average Weighted Mean	**3.25**	**3.14**	**3.26**	**3.49**	**3.63**	**3.36**	**3.36**	**S**

d. Advocacy Programs

Table 12 shows the level of program outputs of the CSPC Extension Services in terms of advocacy programs. Along this parameter, the average weighted mean is 3.45 with verbal interpretation of satisfactory (S). This shows that the College has conducted advocacy programs that helped the marginalized or under privileged sector of the community.

Table 12 Level of Program Outputs of the CSPC Extension Services in terms of Advocacy Programs

Advocacy Programs	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. The advocacy program benefitted us to learn new knowledge and information.	3.37	3.29	3.15	3.84	3.56	3.45	**3.44**	**S**
2. It contributed on the improvement of our way of living.	3.37	3.24	3.23	3.87	3.56	3.45	**3.46**	**S**
3. I disseminated the knowledge I learned to the community.	3.37	3.12	3.13	3.87	3.56	3.45	**3.42**	**S**
4. It has improved the quality of our lives.	3.26	3.24	3.33	3.87	3.56	3.45	**3.45**	**S**
5. It helped me develop my self-esteem.	3.37	3.24	3.32	3.87	3.56	3.45	**3.47**	**S**
6. I applied the knowledge I learned.	3.42	3.39	3.11	3.87	3.56	3.45	**3.47**	**S**
Average Weighted Mean	**3.36**	**3.26**	**3.21**	**3.87**	**3.56**	**3.45**	**3.45**	**S**

e. Livelihood Programs

Table 13 shows the level of program outputs of the CSPC extension services in terms of livelihood programs. Along this parameter, the average weighted mean is 3.45 with verbal interpretation of satisfactory (S). The data obtained implies the fact that the College has indeed conducted livelihood programs for the constituents of the barangay.

Table 13 Level of Program Outputs of the CSPC Extension Services in terms of Livelihood Programs

Livelihood Programs	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. The livelihood program enhanced our entrepreneurial skills.	3.37	3.29	3.15	3.84	3.56	3.45	**3.44**	**S**
2. It helped us augment our income.	3.37	3.24	3.23	3.87	3.56	3.45	**3.46**	**S**
3. It has improved the quality of our lives.	3.37	3.12	3.13	3.87	3.56	3.45	**3.42**	**S**

Table 13 Level of Program Outputs of the CSPC Extension Services in terms of Livelihood Programs (Cont.)

Livelihood Programs	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
4. It has made us more cohesive as a community.	3.26	3.24	3.33	3.87	3.56	3.45	**3.45**	**S**
5. It helped us develop our self-esteem.	3.37	3.24	3.32	3.87	3.56	3.45	**3.47**	**S**
6. I applied the knowledge I learned in my entrepreneurial engagement.	3.42	3.39	3.11	3.87	3.56	3.45	**3.47**	**S**
Average Weighted Mean	**3.36**	**3.26**	**3.21**	**3.87**	**3.56**	**3.45**	**3.45**	**S**

5. Economic and Social Impacts of the Program of the CSPC Extension Services

Impacts of the program of the Extension Services were also analyzed in terms of economic and social as reflected in Table 14 and 15.

a. Economic Impact

Table 14 shows the economic impacts of the program of the CSPC Extension Services. The result shows that the sub-average weighted mean for San Isidro is 3.22 which is interpreted as satisfactory (S), La Purisima with a weighted mean of 3.05 is also interpreted as satisfactory (S); San Roque with a weighted mean of 3.18 is likewise interpreted as satisfactory (S) as well as Sta. Justina with an AWM of 3.45 is interpreted as satisfactory (S). On the other hand, barangay Salay obtained an average mean of 3.69 which is interpreted as very satisfactory (VS) as well as Lourdes with an average weighted mean of 3.63 has VI interpretation of very satisfactory (VS). Along this parameter, the overall weighted mean is 3.37 and registered a verbal interpretation of satisfactory (S).

Table 14 Economic Impact of the Program of the CSPC Extension Services

Economic Impact	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. Enabled me to find a job and become employed as a result of the skills learned.	3.21	3.04	3.14	3.68	3.63	3.45	**3.36**	**S**
2. Enabled me to augment my income as a result of the employment gained.	3.32	2.94	3.13	3.71	3.63	3.45	**3.36**	**S**

Table 14 Economic Impact of the Program of the CSPC Extension Services (Cont.)

Economic Impact	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
3. Enabled me to improve my house as a result of the income generated from such employment.	3.37	3.06	3.33	3.68	3.63	3.45	**3.42**	**S**
4. Enabled me to buy appliances as a result of the income generated from the employment through the skills I learned.	2.95	2.96	3.22	3.71	3.63	3.45	**3.32**	**S**
5. Enabled me to gain properties/ownerships as a result of the income generated from employment.	3.26	3.06	3.16	3.68	3.63	3.45	**3.37**	**S**
6. Improved my economic status being a self-employed individual.	3.21	3.23	3.11	3.71	3.63	3.45	**3.39**	**S**
Average Weighted Mean	**3.22**	**3.05**	**3.18**	**3.69**	**3.63**	**3.45**	**3.37**	**S**

b. Social Impact

Table 15 shows the social impacts of the Extension Programs. The result shows that the sub-average weighted mean for San Isidro is 3.30 which is interpreted as satisfactory (S); La Purisima with a weighted mean of 3.18 interpreted as satisfactory (S); San Roque with a weighted mean of 3.14 is likewise interpreted as satisfactory (S) and Sta. Justina obtained an AWM of 3.45 with an interpretation of satisfactory (S). On the other hand, barangay Salay has an average mean of 3.89 and is interpreted as very satisfactory (VS); Lourdes has an average weighted mean of 3.59 which VI is very satisfactory (VS). Along this parameter, the overall weighted mean is 3.43 which registered a verbal interpretation of satisfactory (S).

Table 15 Social Impact of the Program of the CSPC Extension Services

Social Impact	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
1. Enabled me to become productive and make the right decisions as a result of the skills learned.	3.32	3.27	3.16	3.87	3.59	3.45	**3.44**	**S**

Table 15 Social Impact of the Program of the CSPC Extension Services (Cont.)

Social Impact	San Isidro	La Purisima	San Roque	Salay	Lourdes	Sta. Justina	Overall	
	WM	WM	WM	WM	WM	WM	WM	VI
2. Enabled me to awaken the spirit of volunteerism in me and share the skills I learned to others.	3.21	3.29	3.10	3.87	3.59	3.45	**3.42**	**S**
3. Helped me to boost my self-esteem and confidence as a result of the skills I learned.	3.26	3.17	3.11	3.87	3.59	3.45	**3.41**	**S**
4. Helped me to mingle with other people and go out from our homes to enjoy life.	3.26	3.13	3.24	3.90	3.59	3.45	**3.43**	**S**
5. Helped me to improve my health and nutrition as a result of the information received and learned.	3.37	3.08	3.14	3.90	3.59	3.45	**3.42**	**S**
6. Helped me established camaraderie along with other beneficiaries.	3.37	3.17	3.08	3.90	3.59	3.45	**3.43**	**S**
Average Weighted Mean	**3.30**	**3.18**	**3.14**	**3.89**	**3.59**	**3.45**	**3.43**	**S**

6. Significant relationship between the level of program outputs and impact of the program

Significant relationship between the level of program and impacts of the program were also analyzed in terms of economic and social as reflected in table 16 and 17.

a. Significant Relationship between Economic Impact and Level of Program Outputs

The computed value on the significant relationship between the economic impact and level of program outputs is shown in Table 16. Data reveals that, in all program output indicators with a tabular value at 0.05 of 0.900 except for computer literacy, there exists a significant relationship between economic impact and level of program outputs. Thus, program outputs affect their economic situation.

Table 16 Significant Relationship between Economic Impact and Level of Program Outputs

Program Outputs	Computed Value	Tabular Value at 0.05 level of Significance	Decision	Interpretation
a. Skills Training	0.943	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.

Table 16 Significant Relationship between Economic Impact and Level of Program Outputs (Cont.)

Program Outputs	Computed Value	Tabular Value at 0.05 level of Significance	Decision	Interpretation
b. Health Education Services	1.000	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.
c. Computer Literacy	0.886	0.900	The computed value is lesser than the tabular value, accept H_0.	There is **no** significant relationship.
d. Advocacy Programs	0.943	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.
e. Livelihood Programs	0.943	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.

b. Significant Relationship between Social Impact and Level of Program Outputs

Table 17 shows the computed value on the significant relationship between the social impact and level of program outputs. Data reveals that the null hypothesis was rejected along Health Education Services, Advocacy Programs and Livelihood Programs, hence significant relationship exist between social impact and level of program outputs. On the other hand, null hypothesis was accepted along Skills Training and Computer Literacy.

Table 17 Significant Relationship between Social Impact and Level of Program Outputs

Program Outputs	Computed Value	Tabular Value at 0.05 level of Significance	Decision	Interpretation
a. Skills Training	0.829	0.900	The computed value is lesser than the tabular value, accept H_0.	There is **no** significant relationship.
b. Health Education Services	0.943	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.
c. Computer Literacy	0.771	0.900	The computed value is lesser than the tabular value, accept H_0.	There is **no** significant relationship.
d. Advocacy Programs	1.000	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.
e. Livelihood Programs	1.000	0.900	The computed value is greater than the tabular value, reject H_0.	There is significant relationship.

Discussions and Conclusions

Based on the results presented, it can be observed that the College, under the leadership of the President has evidently shown that CSPC was indeed engaged with the community in which extension officials supervise the implementation of the plans, programs and activities of the College to their partner barangays efficiently and effectively. The result substantiates that the College was truly committed in the delivery of its extension services to the community. Moreover, the College has highly capable personnel and staffs, in terms of delivering extension services, who are engaged to achieve the College mission, goals and objectives. A shared leadership and active participation has been developed among the members of the organization, maximizing their individual potentials in relation to the potential of others. The College evidently has funds available in the conduct of extension programs and activities and that there is a stable funding support from various government agencies, NGOs and other stakeholders.

Along the extent of participation of the development partners in CSPC extension services, it can be noted that the local/barangay officials are greatly involved in the extension services of the College which was evident in the activities conducted by the College in its partner barangays such skills trainings, advocacy and outreach programs and livelihood programs. It was also noteworthy that government agencies such as LGU are very supportive of the extension services of the College for being partners in extension plans, programs and activities of the College. They serve as bridge between the College and the community in the implementation of the extension programs and activities. Community assessment, as emphasized in the conduct of this research, helps build valuable relationships and encourage community members to actively participate in making lasting improvements. Similarly, it is a great way to fully integrate community members as partners in service as they take part in involving themselves to the process of planning of programs and activities all the way to its implementation.

Results further revealed that the College has achieved its objective of addressing the needs and problems of the community through the various programs and activities centered in providing extension services to the community. Further, the College has executed aggressively through the support of National Agencies on the College's extension programs and activities. Also, through the acceptability of the extension projects/services by the partner agencies, extension services can really be executed with quality and excellence.

CSPC is really committed in providing various skills program which could help the marginalized or underprivileged sector of the community and these accomplishments were reflected and properly documented in its Annual Report for 2012-2017. The health education services provided by the College are soundly felt by the respondents. It is one of the best extension programs which benefitted the clients to become more knowledgeable on health

education. Evidently the college conducted computer literacy programs/activities that benefitted the local government units in Rinconada and other national agencies which redound to effective management of their respective offices along information technology. On advocacy projects, the College assisted marginalized communities to their story and produce social change. As a matter of fact, as the College marks its 30th year of existence in year 2013, the College launched the project Trenta Mil Na Pananom sa Rinconada that aims to plant trees in the municipalities of Buhi, Baao, Nabua, Bato, Bula, Baao and City of Iriga. A total of 25,300 trees, have already been planted and sustainably maintained by students, faculty and non-teaching personnel together with partner communities in the identified places. Other advocacy programs of the college include La Dulce Vida which focus on Persons with Disability (PWDs) and elderly, disaster preparedness and mitigation, literacy, bloodletting, therapeutic modality training for parolees, and gender and development. Acknowledging this advocacy, the Department of Environment and Natural Resources recognized CSPC as Second Best Sustainable and Eco-Friendly School for 2015 and as Saringaya Awardee in 2014. Data further revealed that college has indeed conducted livelihood programs for the constituents of the barangay. Added to this, success of some recipients of the livelihood programs conducted by the College was documented. It is also noteworthy that through the extension programs and activities conducted by the College, the economic status of the respondents has been uplifted. This is validated by the number of adaptors who are engaged in entrepreneurial and other similar activities. Result also shows that through the extension programs, projects and activities conducted by the College, the living condition of the marginalized sectors of the society particularly on the programs of the 4Ps have been continually improved as manifested by the Department of Social Welfare and Development (DSWD).

Noting on the data gathered, it can be observed that Computer Literacy appears to have no significant relationship to the level of program outputs compared to other economic aspects which appeared to have greater impact than that of the latter. This suggests that since the majority of the respondents were seemingly employed, they are expected to be equipped with the knowledge and technological skills that only need to be enhanced or developed. Further, on the data gathered, it is therefore manifested that Skills Training and Computer literacy appeared to have no significant relationship as to the level of program outputs of extension services compared to other social aspects like health education services, advocacy programs, and livelihood programs. These two could have been perceived of least impact to the level of program outputs for it is anticipated that skills and computer literacy are two aspects that the majority of respondents already possess and only needs to be enhanced/developed.

Based on the discussions and conclusions, the following recommendations are hereby formulated and offered that the CSPC Extension Service should exert efforts to get the people

involved in the extension program and sustain the delivery of demand-driven and research-based extension program to partner communities and agencies with the goal of uplifting the quality of life of its beneficiaries. A study on the impact of extension programs should be made on a regular basis to continuously monitor more sustainable extension programs that will greatly benefit the underprivileged and underserved communities.

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Organizational Factors and Work Outcomes: A Study on Job Satisfaction, Organizational Commitment and Job Performance

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Abstract

The purposes of this research were to investigate the important factors of organizations affecting job satisfaction and organizational commitment and to examine the key factors influencing job performance in business-sector in Thailand. The research population and sample were Thai business-sector employees. The purposive sampling method was performed in Bangkok and the metropolitan area. A total of 400 usable questionnaires were analyzed in this research. Descriptive statistics, correlation analysis and multiple regression analysis have been employed. The results showed that (1) two key factors which were corporate culture and leader-member exchange had a positive and significant effect on organizational commitment, (2) leader-member exchange and human resource practices had a positive and significant influence on job satisfaction, (3) job satisfaction had positive significant influences on organizational commitment, and (4) organizational commitment positively affected job performance. The research suggests that business management should focus on the three key factors which are corporate culture, the exchange between leader and employees and human resource management practices to improve both the employees' job satisfaction and organizational commitment. Moreover, they should focus on the organizational commitment of their employees to improve job performance and the opportunity of corporate success.

Keywords: Organizational Factors, Job Satisfaction, Organizational Commitment, Job Performance

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Introduction

According to the fact that business environment is dramatically changing, it creates new opportunity for the organizations which are well-prepared, especially in human resources (HR). HR planning and management are very important and are a critical factor for all kinds of organization in today environment. The high-performance employees are a valuable resource for companies to win business games. Therefore, all types of any organizations need to develop their HR and create the environment to manage them to drive organizational growth and productivity. Organizational factors like corporate culture, HR practices and leadership are important factors in terms of improving corporate performance (Iis, Yunus, Adam, & Sofyan, 2018; Rahman, Uddin, & Mia, 2012). In addition, employees' attitudes such as job satisfaction and employees' commitment are the vital factors for corporate success. This research focused on the key factors affecting the employees' key attitudes and job performance in business sector because these factors affect the corporate growth, success as well as the organizational sustainability. According to Robbins and Judge (2017), employees' job satisfaction is a positive emotion about their job result and evaluation. Therefore, job satisfaction plays an important role in the organization. It creates high productivity, low turnover and positive returns (Abdirahman, Najeemdeen, Abidemi, & Ahmad, 2018; Islam, Mahajan, & Datta, 2012; Priya & Sundaram, 2016). Therefore, companies need to find out what key factors influence job satisfaction or dissatisfaction. This helps the management level and supervisors create better atmosphere and effectively connections with their employees for better job performance and corporate achievement. The earlier studies revealed a link between job satisfaction and organizational commitment (Chelliah, Sundarapandiyan, & Vinoth, 2015; Giritli, Sertyesilisik, & Horman, 2013; Priya & Sundaram, 2016; Tarigan & Ariani, 2015; Triwahyuni & Ekowati, 2017). Higher job satisfaction builds higher organizational commitment (Appaw-Agbola, Agbotse, & Ayimah, 2013; Ibrahim, Ghani, & Salleh, 2013; Parsetio, Yuniarsih, & Ahman, 2017). This relationship will lead to job performance and the success of all works in the organization. In conclusion, HR practices are important for all kinds of organizations. The author would like to study the effect of the key organizational factors focusing on corporate culture, HR practices and leader-member exchange on job satisfaction and organizational commitment in business sector. The objective of this research was to investigate the effect of job satisfaction and organizational commitment on job performance of Thai employees in business operations.

The conceptual framework of the research is shown in Figure 1. This study was aimed to test organizational factors as the independent variables influence job satisfaction and organizational commitment and to examine two key factors; organizational commitment and job satisfaction that affect job performance.

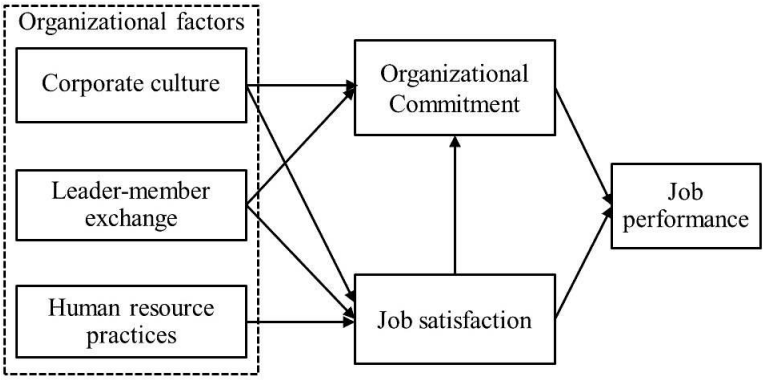

Figure 1 Conceptual Framework

Review of Literature

Organizational Factors

Corporate Culture

Organizations are driven by human resource. Effective HR creates corporate achievement. Akhigbe, Felix and Finelady (2014) pointed out that the employees who were satisfied with their corporate culture would generate benefits for their organization. According to Pitaloka and Sofia (2014) research, it was found that working environment, such as organizational structure and culture, was the critical factor of job satisfaction and also the important factor of organizational commitment. Wolowska (2014) noted that the psychological climate or work environment significantly affected organizational commitment. According to Parvin and Kabir (2011) study, organizational factors including working conditions, fairness, promotion and compensation were important factors that influenced job satisfaction. The study of Appaw-Agbola, Agbotse and Ayimah (2013) found that some cultural factors like team-working, job empowerment and management style affected employees' job satisfaction. According to Trang, Armanu, Sudiro and Noermijati (2013) research, work motivation and leadership had a significant influence on organizational commitment.

Leader-Member Exchange

The exchange between leader and employees is crucial for work effectiveness and corporate achievement. Leader-member exchange (LMX) is the key factor for employees' attitudes and organization performance. It is explained that members' attitude and behavior at workplace depend on their leader's behaviors (Rockstuhl, Dulebohn, Ang, & Shore, 2012). Therefore, the management level of any organization needs to manage the relationship between leaders and followers for effective operation and job performance (Cogliser, Schriesheim, Scandura, & Gardner, 2009). According to Ibrahim, Ghani, and Salleh (2013) study, LMX significantly influenced job satisfaction and had an indirect effect on organizational citizenship behavior. The study of Hsieh (2012) summarized that leader-member exchange had an effect on organizational commitment.

Human Resource Practices

HR is a vital factor in all kinds of organizations (Iis, Yunus, Adam, & Sofyan, 2018; Rahman, Uddin, & Mia, 2012). It leads to employees' abilities, job satisfaction and corporate success. Normally, HR practices consist of many practices like recruitment, selection, training and development, HR planning, work motivation, employee empowerment, team-working, employee retention, compensation and benefits and performance appraisal (Rahman, Uddin, & Mia, 2012). The management level operated the effective firm and expected to improve their communication and relationship with employees for better results (Cogliser, Schriesheim, Scandura, & Gardner, 2009). The study of Sakiru, et al. (2013) found that leadership was an important factor affected the employees' commitment. Meanwhile, Rahman, Uddin and Mia (2012) noted that human resource practices had a positive relationship with employees' satisfaction.

Job Satisfaction

Previous studies pointed out that job satisfaction was one of the key HR factors that improved organizational productivity and corporate success (Abdirahman, Najeemdeen, Abidemi, & Ahmad, 2018; Bongga & Susanty, 2018; Giritli, Sertyesilisik, & Horman, 2013). Job satisfaction leads to better performance, lower employee turnover rate and generate positive outcomes (Priya & Sundaram, 2016). Employees who work with higher job satisfaction have a positive feeling about their job (Islam, Mahajan, & Datta, 2012). The previous studies revealed a relationship between job satisfaction and organizational commitment (Giritli, Sertyesilisik, & Horman, 2013; Priya & Sundaram, 2016; Tarigan & Ariani, 2015). Earlier studies concluded that job satisfaction had a positive effect on organizational commitment (Chelliah, Sundarapandiyan, & Vinoth, 2015; Tarigan & Ariani, 2015; Yucel, 2012). This concluded that job satisfaction was the antecedent of organizational commitment or significantly affected the commitment (Ibrahim, Ghani, & Salleh, 2013; Triwahyuni & Ekowati, 2017). The higher level of job satisfaction results in higher organizational commitment (Appaw-Agbola, Agbotse, & Ayimah, 2013; Parsetio, Yuniarsih, & Ahman, 2017; Yucel, 2012). Moreover, the study of Triwahyuni and Ekowati (2017) found that employees' job satisfaction had a significant impact on job performance.

Organizational Commitment

Organizational commitment is a key factor for organizational achievement (Abdirahman, Najeemdeen, Abidemi, & Ahmad, 2018; Giritli, Sertyesilisik, & Horman, 2013). According to Robins and Judge (2017), organizational commitment is "the degree to which an employee identifies with a particular organization and its goals and wishes to maintain membership in the organization". It is the multi-dimensional factor of organizational

management (Appaw-Agbola, Agbotse, & Ayimah, 2013). Allen and Meyer (1990) concluded that the organizational commitment had 3 dimensions; affective commitment, continuance commitment and normative commitment (Jaros, 2007; Priya & Sundaram, 2016; Tarigan & Ariani, 2015; Trang, Chelliah, Sundarapandiyan, & Vinoth, 2015; Wolowska, 2014). The employees with high commitment continue working for the firm for a long time. They will not leave the organization (Tarigan & Ariani, 2015). According to Abdirahman, Najeemdeen, Abidemi and Ahmad (2018) research, organizational commitment significantly affected employee performance. Meanwhile, the study of Tarigan & Ariani (2015) summarized that employees' organizational commitment had a strong relationship with job satisfaction.

Job Performance

HR practices are important for corporate performance and achievement (Iis, Yunus, Adam, & Sofyan, 2018; Rahman, Uddin, & Mia, 2012). Corporate performance is the collective factor of the employees' performance (Valaei & Jiroudi, 2016). Therefore, the employees' job performance will be the key factor in corporate operation and organizational success. There are many factors affecting the employees' job performance (Iis, Yunus, Adam, & Sofyan, 2018). Previous studies pointed out that operating conditions, the improvement of the work environment, leadership behavior, co-workers, payment and promotion would influence the job performance (Iis, Yunus, Adam, & Sofyan, 2018; Valaei & Jiroudi, 2016). According to Triwahyuni and Ekowati (2017) research, it indicated that employees' job satisfaction had a significant influence on job performance and employees' commitment. The study of Abdirahman, Najeemdeen, Abidemi, and Ahmad (2018) showed that organizational commitment significantly affected employee performance; however, Triwahyuni and Ekowati (2017) found that employees' organizational commitment had no impact on job performance.

Methodology

The population of this research was Thai business-sector employees. The author focused on Bangkok and the metropolitan area since this area was the main focus of Thailand's economic growth and social development. As the target population could not be determined, the study used Cochran's formula for the optimal sample number (Cochran, 1977). At the confidence level and error term of 95% and 5%, respectively, the calculated sample size was 385. The questionnaire comprised five key factors or variables (see Table 1). The study used the 5-Likert type scale ranging from 1 to 5 (1 = strongly disagree, 5 = strongly agree) for all items of the questionnaire. For content validity, the questionnaire was verified by three experts. It was found that the Item Objective Congruence (IOC) average value of all items was .90 (between 0.67-1.00). Therefore, the questionnaire was appropriate to use (Hair, Black, Babin, & Anderson, 2014). The Cronbach's alpha statistic for the questionnaire reliability was

proved with the result of .91. This indicated that there was acceptable reliability. The research data were collected by the structured questionnaire in the purposive and convenience sampling method. For statistical analysis of this research, the author analyzed descriptive statistics and correlation analysis. Next, the multiple regression analysis with the stepwise method was performed to investigate the key factors that affect job satisfaction, organizational commitment and to evaluate the key factors that affect the job performance of the sample.

Table 1 Research Variables

Variables	Symbols	Items	Sources
Corporate Culture (CUL)	CC1	Long-term goal and direction	Akhigbe, Felix and Finelady (2014)
	CC2	Shared vision	
	CC3	Response to External environment	
	CC4	The operation is clear and understandable	
	CC5	Open for employees' idea and change	
	CC6	Employees' cooperation	
	CC7	Promote Cross-functional team	
Leader-Member Exchange (LMX)	LM1	Employees' idea and ability	Scandura and Schriesheim (1994)
	LM2	Employees support supervisor	
	LM3	Employees know the supervisor's potential	
	LM4	Employees trust supervisor	
	LM5	Employees understand the leader need	
	LM6	Employees are ready with supervisor	
	LM7	Relationship with supervisor	
Human Resource Practices (HRP)	HR1	Career path development	Rahman, Uddin, and Mia (2012)
	HR2	Leadership management	
	HR3	Work alignment	
	HR4	Coaching practice	
	HR5	Personal management	
	HR6	Job operation management	
	HR7	Creativity and innovation management	
	HR8	Benefit practice	
Job Satisfaction (JOBSAT)	JS1	Salary and compensation pay	Islam, Mahajan and Datta (2012)
	JS2	Working with co-workers	
	JS3	Management support	
	JS4	Work-life balance	
	JS5	Job opportunities	

Table 1 Research Variables (Cont.)

Variables	Symbols	Items	Sources
	JS6	Job confidence	
	JS7	Evaluation system	
	JS8	Opinion sharing	
Organizational Commitment (COMMIT)	CM1	Organization links	Jaros (2007) and Yucel (2012)
	CM2	Job rotation	
	CM3	Family-like organization	
	CM4	Personal life in an organization	
	CM5	Resignation	
	CM6	Personal life when leaving	
	CM7	Benefits of the existing firm	
	CM8	Organization attachment	
	CM9	Ethics and job leaving	
	CM10	Organization loyalty	
Job Performance (JOBPERF)	JP1	Achievement above the average	Valaei and Jiroudi (2016)
	JP2	Work quality higher than the standard	
	JP3	Complete the expectation	
	JP4	Higher results	
	JP5	Faster promotion/salary	

The equations of this study were:

$$COMMIT = \beta_1 + \beta_5 CUL + \beta_6 LMX + \varepsilon \quad \text{---------- [1]}$$

$$JOBSAT = \beta_2 + \beta_7 CUL + \beta_8 LMX + \beta_9 HRP + \varepsilon \quad \text{---------- [2]}$$

$$COMMIT = \beta_3 + \beta_{10} JOBSAT + \varepsilon \quad \text{---------- [3]}$$

$$JOBPERF = \beta_4 + \beta_{11} COMMIT + \beta_{12} JOBSAT + \varepsilon \quad \text{---------- [4]}$$

Where COMMIT = Corporate commitment,

JOBSAT = Job satisfaction,

JOBPERF = Job performance,

CUL = Organizational culture,

LMX = Leader-member exchange,

HRP = Human resource practices,

b_i = constant; i = 1-4,

b_j = the regression coefficient; j = 5-12,

and ε = error term.

Research Results

After questionnaire designing and collection process, a total of 400 usable questionnaires were used for statistical analysis. The author analysed the descriptive statistics, correlation analysis and multiple regression respectively. The result of the descriptive analysis showed the characteristics of respondents and key variables as in Table 2 and Table 3.

Table 2 Descriptive Statistics in the Characteristics of Respondents (n = 400)

Variables		Frequencies	Percent
Gender	Male	98	24.5
	Female	302	75.5
Education	Below Bachelor Degree	64	16.0
	Bachelor Degree	265	66.2
	Above Bachelor Degree	71	17.8
Existing position	Management level	129	32.3
	Supervisor	81	20.3
	Operational staff	93	23.3
	Office staff	97	24.3
Department	Management	110	27.5
	Sales/Marketing	136	34.0
	Services	108	27.0
	ICT	31	7.8
	Operations	15	3.8

According to Table 2, the majority of the respondents was female at 75.5%. The largest percentage of the education group was Bachelor degree at 66.2%. Meanwhile, the respondents in Management level and Sales/Marketing Department were the majority groups at 32.3% and 34% respectively. As a result, in Table 3, the means of all key variables were high level (means = 3.51 – 3.90). This revealed that the respondents' opinions in key factors were high included corporate culture, leader-member exchange, human resource practices, job satisfaction, organizational commitment and job performance. The normality test of the data, skewness and kurtosis values of all variables were accepted. It was concluded that the normality was good.

Table 3 Statistics in Key Variables

Key variables	Mean	SD	Skewness	Kurtosis
CUL	3.75	0.68	-0.65	1.31
LMX	3.51	0.82	-0.39	-0.19
HRP	3.90	0.56	-0.20	-0.18
JOBSAT	3.86	0.67	-0.28	-0.16
COMMIT	3.65	0.69	-0.25	-0.11
JOBPERF	3.64	0.68	0.02	-0.48

The author tested the multicollinearity condition by the correlation analysis before analyzing the multiple regression equation. As the result in Table 4, all correlation coefficients were less than .70. This could be concluded that there was no multicollinearity issue (Brace, Kemp, & Snelgar, 2012).

Table 4 Correlation Coefficients of All Key Variables

Variables	HRP	LMX	CUL	COMMIT	JOBSAT
HRP	1				
LMX	.222**	1			
CUL	.426**	.326**	1		
COMMIT	.416**	.491**	.527**	1	
JOBSAT	.405**	.583**	.337**	.474**	1

Note: *** it is significant at the .001.

The multiple regression analysis is showed in Table 5 - 8. According to Table 5, the result revealed that corporate culture and leader-member exchange had positive significant influences on organizational commitment. Both two independent variables jointly explained 38.8 percent of the total variance of the organizational commitment. Thus, the regression equation was COMMIT = 1.039 + 0.415 CUL + 0.301 LMX. When the author checked the multicollinearity issue by using VIF, it indicated that there was no multicollinearity issue. After the author tested the Breusch-Pagan test, it was found that the p-value was not significant. Therefore, this equation had no heteroskedasticity problem.

Table 5 Result of Regression Analysis: Organizational Commitment as Dependent Variable

Variables	Unstandardized Coefficients		Standardized Coefficients	t-statistics	Sig.	VIF
	b	Std. Error	Beta			
Constant	1.039	0.167		6.227	0.000***	
LMX	0.301	0.035	0.358	8.635	0.000***	1.119
CUL	0.415	0.042	0.410	9.903	0.000***	1.119
F	127.720					
Sig. of F	0.000***					
Adjusted R^2	0.388					

Note: *** it is significant at the .001.

The result as shown in Table 6 revealed that leader-member exchange and HR practices had a positive significant influenced on job satisfaction. Both two independent variables jointly explained 41.6 percent of the total variance of employees' job satisfaction. When checking the multicollinearity issue by VIF and heteroskedasticity problem by the Breusch-Pagan test, it was found that the equation had no issues. The regression equation was JOBSAT = 1.008 + 0.425 LMX + 0.348 HRP.

Table 6 Result of Regression Analysis: Job Satisfaction as Dependent Variable

Variables	Unstandardized Coefficients		Standardized Coefficients	t-statistics	Sig.	VIF
	b	Std. Error	Beta			
Constant	1.008	0.195		5.171	0.000***	
LMX	0.425	0.032	0.518	13.213	0.000***	1.052
HRP	0.348	0.047	0.290	7.381	0.000***	1.052
F	143.303					
Sig. of F	0.000***					
Adjusted R^2	0.416					

Note: *** it is significant at the .001.

The regression analysis results in Table 7 showed that employees' job satisfaction had a positive significant influence on organizational commitment. It could explain 22.3 percent of the total variance of the organizational commitment. After checking the condition of regression analysis, it was found that the equation had no multicollinearity and heteroskedasticity issue. Thus, the regression equation was COMMIT = 1.774 + 0.487 JOBSAT.

Table 7 Result of Regression Analysis: Organizational Commitment as Dependent Variable

Variables	Unstandardized Coefficients		Standardized Coefficients	t-statistics	Sig.	VIF
	b	Std. Error	beta			
Constant	1.774	0.177		9.994	0.000***	
JOBSAT	0.487	0.045	0.474	10.741	0.000***	1.000
F	115.359					
Sig. of F	0.000***					
Adjusted R^2	0.223					

Note: *** it is significant at the .001.

Table 8 Result of Regression Analysis: Job Performance as Dependent Variable

Variables	Unstandardized Coefficients		Standardized Coefficients	t-statistics	Sig.	VIF
	b	Std. Error	beta			
Constant	2.271	0.169		13.420	0.000***	
COMMIT	0.376	0.046	0.382	8.252	0.000***	1.000
F	68.096					
Sig. of F	0.000***					
Adjusted R^2	0.144					

Note: *** it is significant at the .001.

Finally, the result in Table 8 revealed that only organizational commitment had positive significant influences on job performance. It explained 14.4 percent of the total variance of the job performance. Thus, the regression equation was JOBPERF = 2.271 + 0.376 COMMIT. When the author checked the conditions of regression analysis, it was found that the equation had no issues.

Discussion and Conclusions

This research aimed to study the key factors on corporate culture, HR practices and leader-related factors affecting job satisfaction and organizational commitment in business-sector employees and to examine the effect of job satisfaction and organizational commitment on job performance. Descriptive statistics showed that the majority of respondents were female and the largest percentage of the respondent education level was Bachelor degree. Moreover, the respondents in the management level and the Sales/Marketing department were the majority groups. The findings supported the previous studies that revealed the importance of corporate culture, the exchange between leader and subordinates, and HR practices in

employees' attitude and behavior in the organization. From the multiple regression analysis, the findings found that two key factors which are corporate culture and leader-member exchange had a positive significant effect on organizational commitment. Also, job satisfaction had a positive significant effect on organizational commitment. These findings were consistent with Pitaloka and Sofia (2014) who concluded that working environment, such as organizational structure and culture, was the critical factor of organizational commitment. Trang, Armanu, Sudiro, and Noermijati (2013) pointed out that work motivation and leadership had a significant effect on organizational commitment which was consistent with the study of Hsieh (2012) who summarized that leader-member exchange had an effect on organizational commitment. Another finding showed that leader-member exchange and HR practices had a positive significant influence on job satisfaction. This was consistent with Ibrahim, Ghani, and Salleh (2013) who noted that leader-member exchange significantly influenced job satisfaction as well as Rahman, Uddin, and Mia (2012) who summarized that human resource practices had a positive link with job satisfaction. Moreover, the findings supported the crucial factor like job satisfaction had a positive influence on organizational commitment and organizational commitment significantly affected the job performance of the employees. This was consistent with Triwahyuni and Ekowati (2017) who noted that job satisfaction had an impact on organizational commitment. Finally, the finding confirmed that organizational commitment positively affected job performance. This finding was consistent with Abdirahman, Najeemdeen, Abidemi, and Ahmad (2018) who revealed that organizational commitment significantly affected employees' job performance. However, the research found that job satisfaction had no effect on job performance. The finding did not align with the study of Triwahyuni and Ekowati (2017) who found that Job satisfaction had a significant influence on job performance.

Recommendations

The author suggests that business management should focus on the three key factors which are corporate culture, the exchange between leader and employees and human resource practices in order to improve the employees' job satisfaction and organizational commitment. When the employees work with higher job satisfaction, it will increase organizational commitment. Also, they should focus on the organizational commitment of their employees to improve employees' job performance and the opportunity of corporate success. Finally, the author recommends that future research should examine the reason why job satisfaction does not directly affect the employees' job performance. This will fulfill the academic knowledge of human resource practices and support the knowledge to the management level in terms of building organizational achievement.

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An Improved Scheduling Mechanism for Automated Testing Framework based on Spreadsheet DDT

Maykin Warasart[1]

Abstract

Software Testing is considered as one of the most crucial processes in software development. Although many tools have been used to facilitate software testing, these still lack a critical feature, such as test scheduler. Additionally, they lack flexibility in which the test results must be opened by a specific program only. In this paper, the author proposes that "Rational Functional Tester" is an automated test tool that can provide a scheduling mechanism and can self-generate result logs, which can be conveniently opened by Microsoft Excel. The proposed technique combines the test data from users and a configuration file that acts as a scheduler together. Test results will be output in the same input file from users. The users, especially for the user acceptance testing, only need to deal with their provided files.

Keywords: Software Testing, Automated Testing, Test Automation, Test Scheduling, Test Case

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Introduction

Automated Software Testing (AST) or Test Automation is the utilization of computer software to replace or aid Manual Test Executions. AST offers two obvious benefits to software testing. First, it can improve the accuracy of testing. Secondly, it can reduce testing time and thus overall test duration. In the market today, there are a number of AST tools; however, two of the most prevalent ones are IBM Rational Functional Tester (RFT) (_____, n.d.), and HP Quick Test Professional (QTP). These two tools can be used to create test scripts in 2 ways. First, novice testers can use their built-in recording functionality for simple test cases. However, for more advanced users, they may choose to code the test scripts using the programming language supported by the software to create more complex test scenarios (Nawalikit, & Bhattarakosol, 2009)

For both RFT and QTP, the execution of these scripts is usually triggered by a tester who manually launches the programs and tells them to run each script, one at a time. However, running each script one by one may be very time-consuming, especially in a large test project.

To make matter worse, results or logs of the test script created by AST software are typically in a format that cannot be readily used. Additionally, due to the fact that each script normally represents only one test case, the generated result is separated for each test case and contains more information than typically needed. The difficulty is that the tester needs to gather the results of the logs manually in order to produce meaningful reports. As a result, utilizing these logs is quite troublesome.

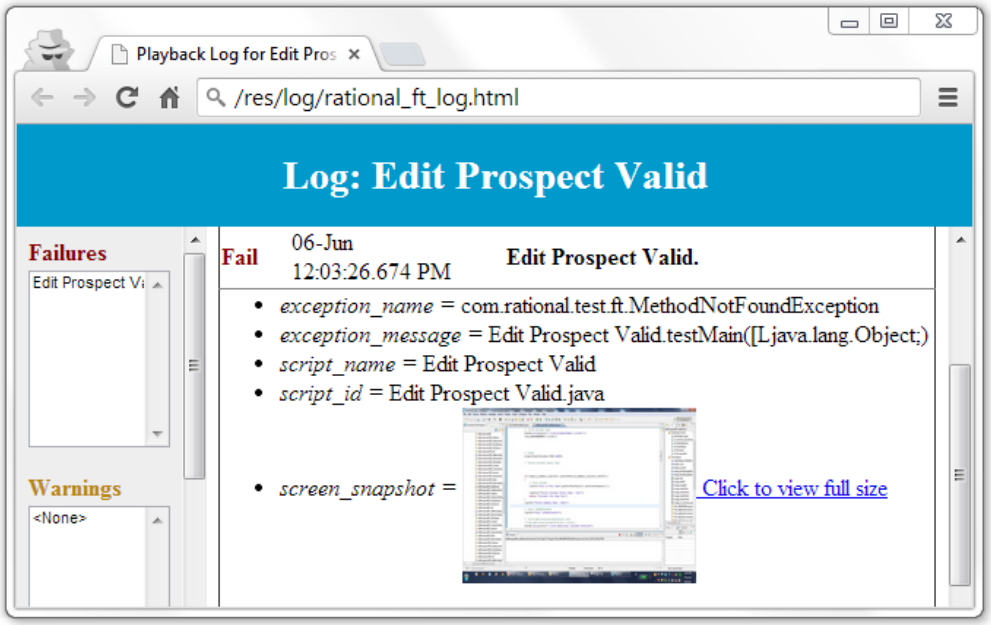


Figure 1 An Example of the Result Log Generated by RFT

Related Theories

Researchers have conducted studies on the use of AST tools (Bering, & Covey, 1991; Huang, & Chen, 2006; Taipale, Smolander, & Kalviainen, 2006; Zhu, Zhou, Li, & Gao, 2008; Karhu, Repo, Taipale, & Smolander, 2009); they have mostly referred to the major benefits of the tools as providing an efficient aid in testing, and that it also has the ability to record scripts for reuse (Playback). Additionally, the researchers have suggested that the record and playback functionalities of the AST tools are flexible, as they can provide an ease of use as well as reducing costs of testing. However, most researchers have not mentioned how these tools could improve the speed, performance and efficiency of testing.

A study conducted by Nawalikit et al. recommended SBTAR (Nawalikit, & Bhattarakosol, 2009) as a tool to help improve the efficiency of generating test results. The study suggests that the format of test results generated by the AST should be changed into a file format that can be recognized by common software in the market, such as Microsoft Word. Nevertheless, the results are probably being separated according to their test scenarios, which still makes it difficult to create a meaningful summary of the overall test results.

Development Details

A. Summary of the System

IBM Rational Functional Tester (RFT) is the software used for automated testing of applications. Automated testers can use RFT to record the test steps or code Java scripts that contain the test steps (Oracle, n.d.). Thereafter, the code can be further modified to test scenarios more accurately. For example, the information (test data) required for test scenarios can be transformed into different sets of data that can be used for the other test scripts. Test scripts can also accommodate additional conditions added to existing test scenarios in the future. In other words, the test scripts are agile and adaptable.

It is worth noting that test data used for RFT test scripts, for example, the information used to fill in the forms, can conveniently be prepared in a spreadsheet using a program such as Microsoft Excel (or Excel) as shown in Figure 2.

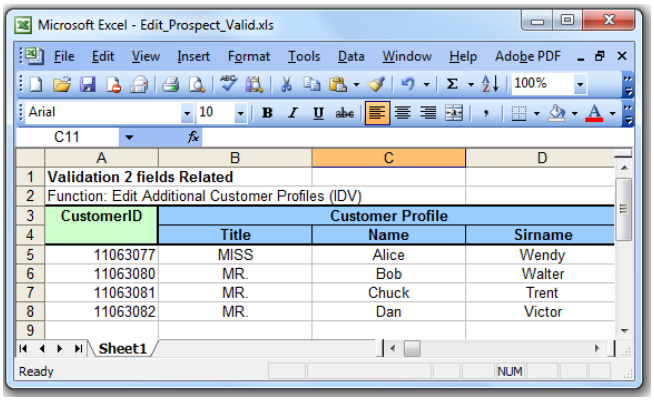
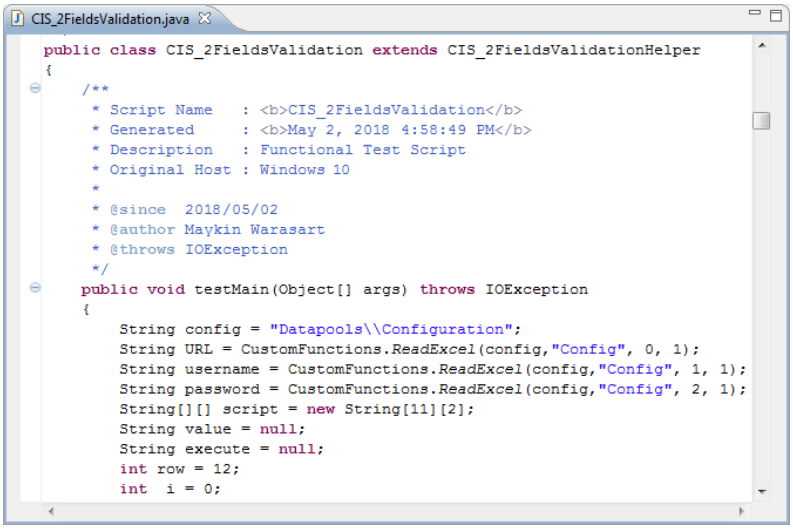


Figure 2 Example of Test Data in Microsoft Excel Format

B. Design, Development and the Workflow of the System

The architectural design of the IBM Rational Functional Tester (RFT) consists of three major components including configuration files, Java libraries and the datapool. When the Main test script as in Figure 3 is executed, it will read a configuration file as shown in Figure 4. In the next script execution step, the test script requires Java libraries in order to read the datapool (the test data) because the configuration file is in the Excel format. It is important to note that the libraries for a successful script execution include the useful methods such as read/write and connection from the Java Excel API (Java Excel API, n.d.), the Jacob API (Adler, 2005), and the POI library (Apache, & Java, 2009).


CIS_2FieldsValidation.java

```
public class CIS_2FieldsValidation extends CIS_2FieldsValidationHelper
{
    /**
     * Script Name   : <b>CIS_2FieldsValidation</b>
     * Generated     : <b>May 2, 2018 4:58:49 PM</b>
     * Description   : Functional Test Script
     * Original Host : Windows 10
     *
     * @since  2018/05/02
     * @author Maykin Warasart
     * @throws IOException
     */
    public void testMain(Object[] args) throws IOException
    {
        String config = "Datapools\\Configuration";
        String URL = CustomFunctions.ReadExcel(config,"Config", 0, 1);
        String username = CustomFunctions.ReadExcel(config,"Config", 1, 1);
        String password = CustomFunctions.ReadExcel(config,"Config", 2, 1);
        String[][] script = new String[11][2];
        String value = null;
        String execute = null;
        int row = 12;
        int  i = 0;
```

Figure 3 Example of the Main Script in RFT

	A	B
1	**URL**	http://mk.in.th/ISM-IBM-RFT/
2	**Username**	automated-tester
3	**Password**	P@ssw0rd
4		
10	**All Script**	0
11		
12	**Script**	**Execute**
13	Search	0
14	Add Custmer	0
15	Edit Customer	0
16	Add Prospect	0
17	Edit Prospect	1
18	Change P to C	0
19	Change Cust type	0
20	Relation	0
21	Add Single Account	0
22	Add Co Account	0
23	Edit Account	0
24	**EOF**	

Figure 4 The Contents of the Configuration File

A closer look of the configuration file in Figure 4 reveals that it contains several fields which are directly inputted into the application. These fields can be information, such as a username, password, etc. The configuration file also contains a column used for specifying the names of the test scenarios (Script) while the column next to it receives a value, such as 0 or 1. The numbers 0 and 1 specify whether test scenario should be conducted when the Main test script is run with RFT (Execute); where 0 means excluded (not conducted) and 1 means included (conducted) This file basically acts as a scheduler or a driver for the test script. The "EOF" indicates that the End of File has been reached, and there are no more test scenarios to be run after this value or cell.

The presence of the configuration file allows for both cost reduction and time saving, since it is not necessary to open and run each of the individual scripts separately. This technique also allows the users to select which test scenarios they want to run at a certain instance and which ones to omit.

After reading the cells specifying which test scenarios should be executed, the Main script will reference and call the test scripts that will actually be executed for the selected test scenarios. These test scripts also use test data from test data files in which the file names are specified in different worksheets within the Configuration file. This method provides for convenience and compactness, as it allows the tester to select only the Configuration spreadsheet needed for the operation beforehand.

The external libraries mentioned earlier are needed for the process of reading the information, used for the test scenario, from the datapool. These libraries allow for the extraction of the information from each of the cells of the test data. They automate the filling out of the forms and fields of the program/application under test in an orderly and easy manner. The format of the test data requires that each row represents one record. Once the end of the row is reached, it signifies that the information to be filled out for that record is complete, and the marker continues onto the next row of information. However, each test scenario may have different methods of filling out information; it depends upon the objective of each test scenario. Such flexibility allows for multiple forms of test data and records that can be included in one file. The end of the test data file is denoted by an "EOF" which says that there are no more records in this file. Testing of an application, controlled by detailed information from a spreadsheet is known as Data Driven Testing (DDT).

Once the IBM Rational Functional Test (RFT) tool has completed running the test scenarios specified, it will generate a log reporting whether the test scenarios have passed or failed. A passed status implies that the functionality under test performed as expected (Expected Result). A failed status means the opposite. Additionally, one of the features of the RFT allows the ability to extract information from Graphical User Interface (GUI) objects. In this feature, text can be extracted from objects, such as, but not limited to, buttons, fields and dialog boxes.

Text that is extracted from the application under test is usually the one that notifies the status of the test condition. In other words, it produces the actual test result which is then compared to the expected test result.

The result of the test scenario is stored in the same file as the input (the test data) for the test scenario. Specifically, it is stored in the column next to the expected result. This allows for a swift and convenient means of comparison of the actual result of the test scenario against the expected result.

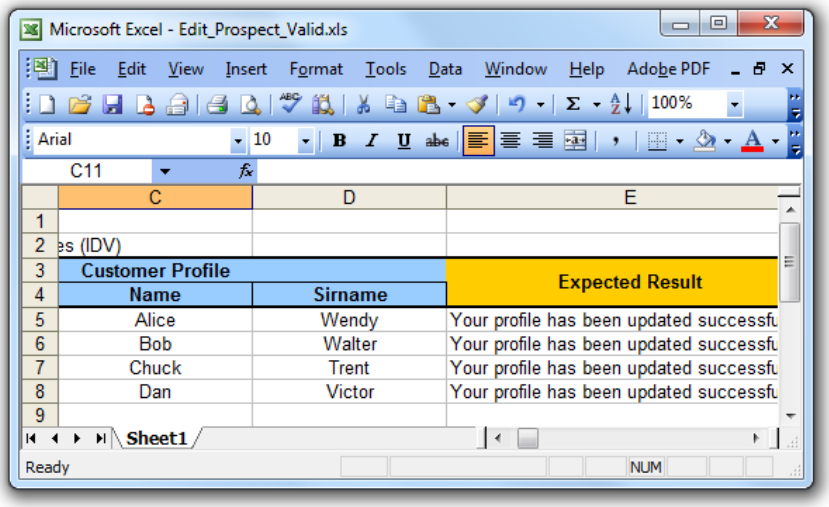


Figure 5 Input Test Data File

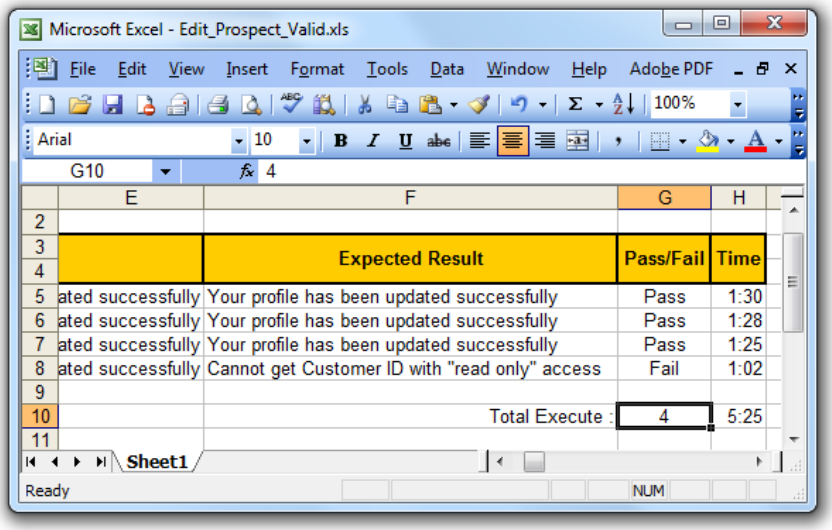


Figure 6 Output Test Data File

Figure 5, as illustrated below, shows the expected result of the input test data file while Figure 6 shows the contents of the output test data file generated from the input test data file. The output test data file contains the actual result of the test scenario in the column next to the expected result, along with a notification of whether the test scenario is a pass or fail. Additionally, the execution time of each test scenario and the total number of executed test

scenarios are printed on the output test data file. If we need to execute the test more than one cycle with the same scenario, we are able to modify, to script and to write the result with different column with the timestamp in case we need the keep the execution history.

C. Limitations and Constraints of the System

Due to the fact that this study focuses on the test scenario development by using RFT and Excel, the project is constrained by the limitations of RFT and Excel requirements. As such, the Java Runtime Environment (JRE) and libraries specified in development details, B. are required to operate in RFT. It must also be noted that the recommended solution requires relatively a lot of time in order to create the scripts. However, this is expected in any automated testing since a great amount of time is typically required to create test scripts that are expandable, accurate and cover all required test conditions

Running the System

The test scripts developed by the RFT in this study were used to test one of IBM's internal web applications. This web application was chosen for this study because it contains a large variety of GUI components, allowing for a wide variety of test scenarios.

A. Environment of the System under Test

The system under test includes the following:

- Microsoft Windows 10
- Microsoft Office 2016
- Java Runtime Environment v8
- IBM Rational Functional Tester v8.6

B. Results and Analysis of the Test

According to the results of testing of the chosen test scenarios, it can be concluded that the IBM Rational Functional Tester (RFT) can reduce the workload of the tester conducting regression testing (Wikipedia, 2019). Table 1 demonstrates how effort (man hours) can be reduced after implementing the proposed solution.

Table 1 Comparison of Man Hours of Activities before and after Implementation of Solution

Activity	Days Spent	
	Before	**After**
Creation of the scripts	25	27
Preparation of test data	2	2
1st cycle of using scripts	20	10
2nd cycle of using scripts	19	10
Total	66	49

The test results of the software can also be presented in a simple manner because the results and test conditions are organized and kept within the same file. This makes it easy for testers to analyze the results of the test scenarios and to see which test case is passed or failed, along with the reasons of the failed test cases. In addition to providing the users with the ability to generate test results in a simple format, as demonstrated in this study, the tool also provides built-in test results/logs (refer to Figure 1) that offer further detailed information of the test results.

Conclusion

In order to improve the quality of software, it is vital to have effective testing to validate that the software operates in accordance with the requirements. However, the process of testing can be very time consuming and costly. Therefore, the authors propose that automated software testing (AST) tools should be implemented to reduce the test effort, duration and the cost. However, many Automated Software Testing (AST) tools, in the market today, lack the scheduling feature that allows for multiple test scripts execution to cover multiple test scenarios. They are also incapable of producing and displaying the test results in an easy-to-read format.

The conclusion of this study suggests a solution to solve these issues through the use of the IBM Rational Functional Tester (RFT). This tool utilizes a configuration file that acts as a scheduler for multiple runs of various test scripts. These test scripts, in turn, can execute many test scenarios. Each of the test scenarios retrieves the test data from an input test data file. After the scheduler is run, an output test data file is generated, displaying the actual result and comparing it to the expected result, along with the status (pass/fail) of the test scenario. The RFT reduces both the time and cost spent in running the test scripts; it essentially offers a simpler-to-use solution to software testing than its competitors.

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The Effects of Competition Strength and Non-Tariff Barriers in Destined Countries Towards Business Sustainability of Small and Medium Snack Industries in East Java Through Exports

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Abstract

Currently, small and medium industries are growing rapidly in Indonesia**.** In marketing their products, companies not only focus on the domestic market but also seek to penetrate the export market to several countries**.** The purpose of this research was to find out whether or not competition strength and non**-**tariff barriers through exports would influence the business sustainability of small and medium snack industries in East Java, Indonesia**.** Sampling of 30 respondents was conducted using purposive random sampling method**.** The analytical method used in this research Structural Equation Modeling **(**SEM**)** with SmartPLS software**.** The results showed that the strength of competition through exports did not significantly influence the sustainability of small and medium industries in East Java whereas non**-**tariff barriers through exports had a significant effect on the sustainability of small and medium industries in East Java**.**

Keywords: Competition Strength, Non-Tariff Barriers, Exports and Business Sustainability

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Introduction

Small and medium businesses in Indonesia are growing intensively. Many start-up businesses with creative and innovative ideas are increasing the number of small and medium industries in Indonesia. In East Java, Micro, Small, and Medium Enterprises are the backbone of the economy. This can be seen from empirical facts in the field. Among them are the performance of the industrial process in the last five years and the share towards the nation has increased, from 19.91 percent in 2013 to 21.70 percent in 2017. In the past four years, the contribution of food and beverage industry sub-sector has an average of 31.69 percent while the tobacco processing sub-sector has an average of 26.63 percent, and chemical, pharmaceutical and traditional medicine industries has an average of 8.03 percent. (Soekarwo, 2018). From these data, it can be seen that food and beverage industry are in the first list for its contribution to GRDP in East Java. The research conducted by Widyatmini (2013) on the Grand Export-Oriented SME Development Strategy also explained that SMEs contribute to the Regional GDP as well as Banten's Original Revenue.

The results of the 2016 National Social Economic Survey showed that the total number of Micro, Small and Medium Enterprises in East Java is 9.59 million MSMEs. Competition becomes increasingly tight among small and medium industries themselves, even with large companies that already have names. To overcome the high competition in the country, small and medium industries start to look at foreign markets. The rapid development of information technology now also contributes to the ease of the small and medium industries in expanding themselves abroad. To enter foreign market is not easy since various provisions from their own country or the provisions of the destined country must be fulfilled. In the end, the small and medium industries must complete themselves in accordance with the provisions of the two countries which can take quite a long time and are quite complicated, especially the provisions in the destined country. The entrepreneurs also have to face competitors from other countries. Facing a situation like this, small and medium-sized business people carry out export activities, some of them bring their products directly into the destination country, and some are sent via courier services. From this export they get sales turnover so that they can contribute to the country's foreign exchange.

Research Questions

Based on the background of the conditions and situations of small and medium industries in East Java, it was interesting to study to find out:

1. Does the strength of competition and non-tariff barriers in destination countries affect the export of snack products in small and medium industries in East Java?
2. Does the export of snack products in small and medium industries affect the sustainability of small and medium enterprises in East Java?

3. Does the strength of competition and non-tariff barriers in destination countries affect the sustainability of small and medium enterprises in snack products in East Java through exports?

Research Purposes

The purposes of this research were:

1. To find out whether the strength of competition and non-tariff barriers in destination countries affect the export of snack products in small and medium enterprises in East Java.
2. To find out whether the export of snack products in small and medium industries affect the sustainability of small and medium enterprises in East Java.
3. To find out whether the strength of competition and non-tariff barriers in destination countries affect the sustainability of small and medium enterprises in snack products in East Java through exports.

Literature Review and Development of Hypotheses

The theoretical basis used in this research includes:

Strength of competition

Porter (2007), Porter's five forces that can determine long term profitability of certain market segments are:

1. Rivalry among competing firms

Certain segments become unattractive if they already have many strong or aggressive competitors. If the segment is stable or declining, the addition of factory capacity is done on a large scale, fixed costs are high and competitors have a big interest to stay in that segment, it becomes more unattractive.

2. Threat of new entrants

The most attractive segment is the segment that has high entry barriers and low exit barriers. Few new companies can enter and poorly performing companies can easily get out.

3. Threat of substitutes

Certain segments become unattractive if there is a product substitution which is actual and potential. Such substitution limits price and profits.

4. Bargaining power of buyers

Certain segments become unattractive when buyers have a strong or increasing bargaining position.

5. Bargaining power of suppliers

Certain segments become unattractive if company suppliers are able to increase the price or reduce the quantity they supply.

Non-Tariff Barriers

According to Ball, Geringer, Minor and McNett (2014), non-tariff barriers are all forms of discrimination against imported goods other than import duties. The forms of non-tariff barriers vary, such as quantification non-tariff barriers and non-quantification non-tariff barriers.

Quantification non tariff barrier is the quota, which is the limit of the amount for a particular type of item that is permitted to enter into a country without any restrictions within a certain period of time. On the other hand, non-quantification non-tarrif barriers is a study of non-quantitative barriers revealed more than 800 different forms that could be classified into three main groups which are 1. Government direct participation during trade, 2. Customs and other administrative procedures and 3. Standard.

Affiliation Chairman Businessman Food and Beverage Industry Indonesia (GAPMMI), Adhi Lukman, said food and beverage industry exports are constrained by non-tariff barriers imposed by several countries. Non-tariff barriers are seen as more difficult than tariff barriers. Some countries require new rules for imported products, such as *labeling* and residual content in products. For non-tariff measures, they could not be calculated. There is an example of the refusal of the United Arab Emirates that the halal logo of Indonesian products is not recognized in that country. In fact, there have been certifications and have been sent for years. The United States also imposes non-tariff barriers through the Food Safety Management Act. In this law, products and producers who want to penetrate the United States market must meet the applicable standards which covers factories and facilities in the factories. Such policy has barred Indonesia's food and beverage exports (Adhi, 2012, Tempo**.**Co, Jakarta).

President of Trade Safety, Pradnyawati, stated that the Ministry of Trade would continue to socialize and monitor the latest developments in this regulation and coordinate with relevant ministries or institutions.

Non-Tariff Measures Include

1. Products or services standardization quality

This method is done by imposing special quality standards for products or services that will enter a particular country. They shall meet the country's quality standards. This limitation is not at all related to financial aspects.

2. Import quota limitation

This is done by limiting the quantity of goods that may enter a country. Restrictions on the number of goods are carried out so that imported products do not exceed in domestic market. With this restriction, it is expected that domestic products can compete with imported ones.

3. Particular procedures or regulations

Particular procedures or regulations imposed by the local government can be the biggest obstacle faced by foreign products. Government regulations or procedures are the key for the

entrance of foreign products. With the existence of these special regulations, the movement of foreign products within the importing country can be limited.

4. Market structure

The market is a place for transactions between sellers and buyers. The market has its own structure that makes itself distinctive and different compared to other markets. This has become a tangible barrier to foreign products that will enter the country.

5. Political, economic and socio-cultural conditions

A product or service from foreign countries must pay attention to factors, such as the political, economic and socio-cultural goals of the country. By paying attention to these factors, it is expected that marketing efforts will be easier. However, usually in the presence of these factors it actually inhibits the movement of the company's marketing steps.

Export of Snack Products

Griffin and Pustay (2015), exporting activities are selling products made in their own country to be used or resold in other countries. Export and import activities are often divided into two groups, which are trading activities in the form of goods and in the form of services. Exports in this study are trade activities in the form of goods. Exports are very important for the financial health of a company.

Small and Medium Industry Sustainability

Definition of Industry

According to Regulation of the Minister of Industry of the Republic of Indonesia No. 64 of 2016, it is all forms of economic activities which process raw materials and/or utilize industrial resources to produce goods that have higher added value or benefits, including industrial services.

According to Regulation of the Minister of Industry of the Republic of Indonesia No. 64 of 2016, small industry is defined as an industry that employs the maximum of 19 workers and has an investment value of less than one billion Rupiah, excluding land and buildings for business while a medium industry is the industry that employs the maximum of 19 workers and has an investment value of at least 1 billion Rupiah or employs at least 20 workers and has the maximum investment value at fifteen billion Rupiah.

Meanwhile, according to the Regulation of the Minister of Industry RI No. 11 of 2014, the definition of Small and Medium Industries is an industry with the maximum investment value at 500,000,000 Rupiah, excluding land and buildings for business. Medium industry, namely industry with an investment value greater than 500,000,000 Rupiah or up to 10,000,000,000 Rupiah, excluding land and buildings.

Small Industries Sustainability

The analysis of De Geus (1997) revealed that the companies that rise to the 'living company' status have four distinctive characteristics:

1. Awareness to the surrounding world. Long living companies imitate, learn and adapt to things around them.
2. Awareness of the identity. Companies are very cohesive and have a strong sense of identity to build a community together.
3. Tolerance towards new ideas. Companies are tolerant, generally not centralized, with authorities making even decisions and tolerating "non-core" activities in the region which might later become the core business.
4. Financial conservatism. A company which is conservative with its financial is used to regulate its own growth and make choices.

Hypotheses

1. The strength of competition and non-tariff barriers in destination countries affect the export of snack products in small and medium industries in East Java.
2. The export of snack products in small and medium industries affect the sustainability of small and medium enterprises in East Java.
3. The strength of competition and non-tariff barriers in destination countries affect the sustainability of small and medium enterprises in snack products in East Java through exports.

Research Methods

The research was conducted through a survey of the research population which included all small and medium enterprises in East Java. The sample was determined by simple random sampling and randomly selected 30 small and medium enterprises as representatives. Data analysis in this research was Partial Least Square technique by using the SmartPLS program. The methods in SmartPLS analysis included evaluating the outer model which comprised convergent validity, discriminant validity and composite reliability whereas the inner model evaluation included R- Square, Q-Square, Path Coefficient Test and indirect effect testing (Sobel test).

Result and Discussion

The population of this research was all Snack Production Industry in East Java. Respondents consisted of 76,7%% female and 23,3% male, age 31-40 accounted for 56,6% and age 41-50 accounted for 43,4%. This indicated that all respondents were in working age.

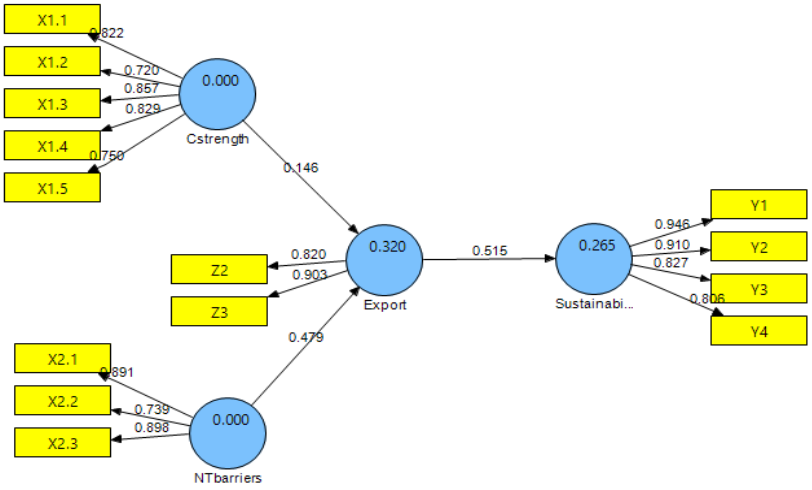

Figure 1 Outer Model

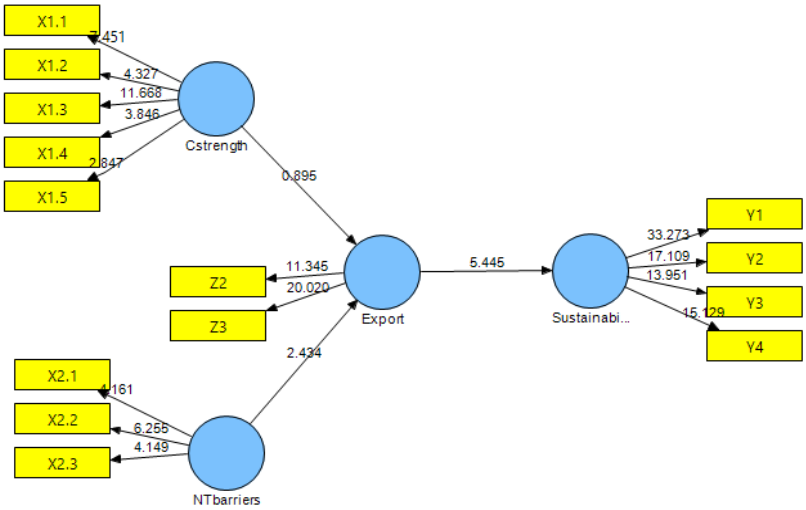

Figure 2 Inner Model

A. Measurement Model (outer model)

Convergent Validity

Table 1 Outer Loadings

	Cstrength	Export	NTbarriers	Sustainability
X1.1	7.451			
X1.2	4.327			
X1.3	11.668			
X1.4	3.846			
X1.5	2.847			

Table 1 Outer Loadings **(**Cont**.)**

	Cstrength	**Export**	**NTbarriers**	**Sustainability**
X2.1			4.161	
X2.2			6.255	
X2.3			4.149	
Y1				33.273
Y2				17.109
Y3				13.951
Y4				15.129
Z2		11.345		
Z3		20.020		

Source: data analysis

Table 2 Ave and Communality

	AVE	**Communality**
Cstrength	0.636	0.797
Export	0.744	0.862
Ntbarriers	0.716	0,846
Sustainability	0.764	0.874

Source: data analysis

The outer validity of the reflective indicator model was tested through convergent validity and discriminant validity. Testing of convergent validity requires the value of the loading factor of the indicator relationship with latent variables greater than 0.50 (Ghozali, 2008) and the value of Average Variance Extracted (AVE) above 0.50 (Latan & Ghozali, 2012). In this research, there were two indicators on the non-tariff barrier variable whose value was less than 0.5 and an indicator from export. Therefore, the indicator was removed from the previous model and continued with the next test. From the data analysis result in table 1 and 2, each indicator had an outer loading, where AVE and community value above 0.5 meaning convergent validity. Thus, all indicators could be used for further analysis.

Table 3 Cross Loadings

	Cstrength	**Export**	**NTbarriers**	**Sustainability**
X1.1	0.822	0.199	0.397	0.343
X1.2	0.720	0.056	0.405	0.269
X1.3	0.857	0.450	0.490	0.372

Table 3 Cross Loadings **(**Cont**.)**

	Cstrength	**Export**	**NTbarriers**	**Sustainability**
X1.4	0.829	0.264	0.338	0.170
X1.5	0.750	0.275	0.346	0.023
X2.1	0.272	0.467	0.891	0.501
X2.2	0.596	0.516	0.739	0.245
X2.3	0.352	0.376	0.898	0.528
Y1	0.290	0.504	0.457	0.946
Y2	0.268	0.394	0.356	0.910
Y3	0.302	0.389	0.370	0.827
Y4	0.188	0.486	0.509	0.806
Z2	0.456	0.820	0.392	0.335
Z3	0.242	0.903	0.543	0.530

Source: data analysis

Table 4 Av Root

	AVE	**AVE ROOT**
Cstrength	0.636	0.636
Export	0.744	0.744
Ntbarriers	0.716	0.716
Sustainability	0.764	0.764

Source: data analysis

Discriminant Validity

From the results of analysis in Tables 3 and 4, all indicators already had the largest cross loading value in the variable and met the discriminant validity. Thus, all indicators could be used for further analysis because all indicators have met the validity of the test. All correlation values between variables are below the AVE root value and meet the discriminant validity

Table 5 Composite Reliability

	Composite Reliability
Cstrength	0.897
Export	0.85
Ntbarriers	0.882
Sustainability	0.928

Source: data analysis

Composite Reliability

The results of the analysis in table 5 showed that all variables had composite reliability values above 0.7; thus, all variables were reliable.

B. Structural Model (Inner model)

Table 6 R-Square

	R Square
Cstrength	
Export	0.320
Ntbarriers	
Sustainability	0.265

Source: data analysis

R-Square and Q-Square

The results of the analysis in table 6 showed that R-Square export was 0.320 meaning that exports of small and medium industries were influenced by the strength of competition and non-tariff barriers by 32.0%. Meanwhile, the R-square of the business continuity was 0.265 meaning that business continuity was affected by exports by 26.5%.

R-Square value overall was calculated from the equation as Q-Square= 1-((1-0.320) x (1- 0.265))= 0.5002

R-Square value was 0.5002 meaning that structural model could explain the condition in the field by 50.0% while the rest was explained in other variables which were not examined.

Path Coefficient Test

Table 7 Path Coefficients **(**Mean, STDEV, T-Values**)**

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**Standard Error (STERR)**	**T Statistics (|O/STERR|)**
Cstrength -> Export	0.146	0.221	0.163	0.163	0.896
Export -> Sustainability	0.515	0.547	0.095	0.095	5.445
NTbarriers -> Export	0.479	0.448	0.197	0.197	2.434

Source: data analysis

Hypothesis Testing

Hypothesis testing in this research was carried out by looking at the T Statistic value:

If the value of T Statistics ≥ t table, there is a significant influence between these variables. **(for α 0.05, t table value 1.96).**

If the value of T Statistics ≤ t table, there is no significant influence between these variables. **(for α 0.05, t table value 1.96).**

Direct and Indirect Effect Testing

From the test results, the first, second, and third hypotheses can be answered as follows,

First Hypothesis: The strength of competition and non-tariff barriers in destination countries affected the export of snack products in small and medium industries in East Java.

From Table 7, it can be seen that competition strength did not have a significant effect on the exports of small and medium-sized snack food products in East Java, as evidenced by the results of T Statistics ≤ T table, which was 0.89 ≤ 0.196 (α 0.05). The strength of business competition did not have a significant effect on the exports of small and medium industries. From the results of interviews, there are many other factors that can make small and medium industries able to carry out export activities, more capital, good business management and licensing. However, non-tariff barriers had a significant effect on the export of small and medium-sized snack food products in East Java which is evidenced by the results of T Statistics ≥ T table which was 2,434 ≥ 1,96 (**α** 0,05).

Second Hypothesis: The export of snack products in small and medium industries affected the sustainability of small and medium enterprises in East Java.

From the results of the analysis in table 7, it can be seen that the export of small and medium-sized snack food products had a significant effect on business sustainability, and this can be proven by the results of T test ≥ T table, which was 2,434 ≥ 1,96 (**α** 0,05).

Third Hypothesis: The strength of competition and non-tariff barriers in destination countries affected the sustainability of small and medium enterprises in snack products in East Java through exports.

To test the indirect effect, further testing was done by using the theory formulated by Kenny and Baron (1986) by using Sobel test as shown in table 8 and 9.

From the results of the test, the strength of business competition on business sustainability through exports shows the T statistic ≤ T table which was 0.884 ≤ 0.196, meaning that there was no significant influence of business competition on business sustainability through the export of small and medium industries. Nonetheless, the results of the tests non-tariff barriers on business sustainability through exports showed T statistics ≥ T table, which was 2.219 ≥ 1.96. This was a significant influence on non-tariff barriers to business sustainability through the export of small and medium industries.

Table 8 Sobel Test Competision Strength to Sustainability

Input:			Test statistic:	Std. Error:	*p*-value:
a	0.146	Sobel test:	0.8837239	0.08508314	0.37684528
b	0.515	Aroian test:	0.86944175	0.08648078	0.38460556
s_a	0.163	Goodman test:	0.89873382	0.08366215	0.36879446
s_b	0.095	Reset all		Calculate	

Source: data analysis

Table 9 Sobel Test Nontariff Barrier to Sustainability

Input:			Test statistic:	Std. Error:	*p*-value:
a	0.479	Sobel test:	2.21853543	0.11119272	0.02651835
b	0.515	Aroian test:	2.18776358	0.1127567	0.02868683
s_a	0.197	Goodman test:	2.25064338	0.10960644	0.02440813
s_b	0.095	Reset all		Calculate	

Source: data analysis

Conclusion

Based on the above discussion, it can be concluded that:

1. The competition strength in business did not significantly influence the exports of small and medium of snack products. This means that the competition strength is not a barrier for small and medium industries in East Java in exporting their products.

Non-tariff barriers significantly influenced the exports of small and medium industries of snack products. This means that the higher the barriers, the smaller the opportunity for exports.

2. Exports of small and medium industry of snack products had a significant effect on the sustainability of the business. This means that increased exports will increase welfare.

3. The strength of competition indirectly through exports did not have a significant effect on business sustainability. However, non-tariff barriers indirectly through exports had a significant effect on business sustainability.

Recommendations

Based on the conclusions above, it can be suggested that:

1. Small and medium industries must learn about non-tariff barriers in destination countries before exporting.

2. Exporting should be maintained through small parties by using couriers.

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Cooperative Trading House:
Digital Marketing Strategy of Economic Community in East Java Province

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Abstract

East Java Province Government has a commitment to build Micro, Small and Medium Business Enterprise as a battering ram for people's economy. Through cooperative understanding, the government established Cooperative Trading House, which accommodates small medium entrepreneurs and customers. It also creates challenge for east java government to increase people's economy revenue. The objective of this research is to identify digital marketing strategy for micro, small medium business enterprises in East Java Province by using digital media.

Research subject is entrepreneurs from micro, small and medium enterprise in Java Province that joined the Cooperative Trading House. Qualitative descriptive was applied as research method to observe information from the finding and to give an in-depth overview related to digital marketing. The result of this research shows that respondents get access to internet through phones and personal computer. Moreover, respondents increase their sales by doing digital marketing activities. This research recommends East Java Government to develop digital marketing in economic community through Cooperative Trading House.

Keywords: Cooperative Trading House, Digital Marketing, Micro Small Medium Business Enterprise

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Preliminary

In 2015, with the opening of the free market ASEAN Economic Community (AEC), there was a business opportunity as well as a threat to Cooperative and Micro, Small Business Enterprise. This underlines business actors to increase their competitiveness. This is a challenge for the East Java Provincial Koperasi and Micro Small Medium Business Enterprise Office to improve the competitiveness of Cooperative and Micro, Small Medium Business Enterprise in terms of products and marketing. To overcome this, the East Java Cooperative and Micro, Small and Medium Business Enterprise Office established Cooperative Trading House (CTH). CTH is an independent professional institution that handles Cooperative and Micro, Small Medium Business Enterprise products in an integrated manner and to build work systems that can be used as a medium to increase the potential of Coopertive and Micro, Small Business Enterprise in overcoming various weaknesses, especially product problems ranging from upstream to downstream. CTH, with more than 200 members of Micro, Small and Medium Business Enterprise was established in the early 2018 with functions to mediate product development, packaging and marketing of various Cooperative and Micro, Small and Medium Business Enterprises' products in East Java with wider access. The population in East Java that has exceeded 38 million is a large domestic market with potential. The purpose of Cooperative Trading House specifically is to mediate producers and potential buyers, especially non-retail buyers, to facilitate the development of business networks with domestic markets and export markets, to provide technical advice and guidance as needed to producers and/or traders from Micro, Small and Medium Business Enterprise trading member house as well as to convey information regarding market dynamics and trends, product quality and packaging in order to obtain non-retail markets in particular and in retail, to facilitate Micro, Small and Medium Enterprise to access production, distribution, marketing technologies and funding sources.

There are several forms of services carried out by CTH in facilitating and helping its members. First, CTH Managers provide services in terms of market research where the results of this study are then process and adapt to the characteristics and capabilities of cooperatives and Micro Small Medium Busines Enterprise members of CTH. If the results are feasible, this information is immediately conveyed to be realized. Second, CTH must guarantee that both foreign and domestic buyers can be trusted. For this reason, CTH needs to identify potential buyers. This method is done to reduce the risk of dealing with buyers with low potential. Third, sales negotiations, since not all members of Cooperative and Micro, Small and Medium Business Enterprise are used to negotiating with foreign buyers, CTH must take the initiative in conducting negotiations where the results of negotiations are immediately submitted to the members of Koperasi and Micro, Small and Medium Business Enterprise. Fourth, the marketing network. CTH must be able to compile a marketing network, especially overseas marketing networks, so that the production turnover of members of Koperasi and Micro, Small and Medium

Business Enterprise is relatively stable and does not fluctuate. Fifth, technology and packaging ensures that product specifications are in accordance with demand. Sixth, the provision of raw materials where some business actors experience serious difficulties in obtaining raw materials, most of which must be imported. Seventh, information on foreign markets where one of the prominent weaknesses of members is the lack of information on foreign markets. CTH must provide foreign market information to members of Cooperative and Micro Small Medium Business Enterprise so that they have an idea of foreign business including its marketing. Eighth, guidance and development. CTH has a network with various agencies; therefore, CTH can work with other agencies to conduct training aimed at improving the skills of the workforce. Ninth, access to capital where members can take advantage of access to capital offered by CTH obtained from several partners, both government and private institutions.

The nine services provided by the East Java Provincial Government have so far been utilized by Micro, Small and Medium Business Enterprise actors who are members of Cooperative Trading House. In turn, being invited to participate in exhibitions in various regions, the members are also trained to use social media in marketing their products, to communicate with their buyers and business partners well, to deal with conflicts and conditions so as not to sacrifice their business. All of these facilities are free of charge to Cooperative Trading House members. The focus of the East Java Koperasi and Micro Small Medium Business Enterprise Office is to expand marketing for CTH member products through digital marketing. Business people are also required to be able to market their products through a digital marketing system. Since marketing is done through the internet which is wider, this will affect product sales. According to Bambang Wahyuono, the Cooperative Trading House Manager, currently businesses mostly run by women still do not understand how to market goods through the internet. Most of the Micro, Small and Medium Business Enterprise players from the regions still rely on marketing in the traditional way.

Discussion

A. People’s Economy in East Java

The Democratic Economy emerged when Burhanuddin Jusuf Habibie or as BJ Habibie was a leader. In 1998, when the economic crisis hit Indonesia, the role of the government to foster a populist economy began to be encouraged. At that time, the defense of small entrepreneurs was the key to rehabilitate economic damages due to the multi-crisis that occurred in Indonesia, and became the government's priority program. In 1998, the People’s Consultative Assembly issued its political decision through the Peoples Consultative Assembly Decree / Number 16 / MPR / 1998 concerning Political Economy in the Framework of Economic Democracy, which was then popularized as the People's Economy. (Arifin & Rachbini, 2001: 127). This provision had a strategic value because it gave the dictum for the government to side

with the people's economy. This provision is a source of reference for enacting lower legislation in order to achieve a more egalitarian, democratic and conducive economic order for the emergence of a massive middle class. (Arifin & Rachbini, 2001: 154). After the era of BJ Habibie's leadership ended, this Popular Economy still continued until the current era of Jokowi's presidential leadership. Since the basic concept of Population Economy is rooted in Pancasila as the basis of the State of Indonesia, this populist economy is strengthening the State in the event of a crisis in Indonesia in 1998. Evidently, when Indonesia was hit by a monetary crisis, Micro, Small and Medium Business Enterprises were not affected.

People's Economy is an economic system based on the 4th Precept of Pancasila, led by wisdom in deliberation/representation. The People's Economic System is part of the Pancasila Economic System which emphasizes the democratic nature of the economic system that sits with the majority of people who are still suffering (Mandate of People's Suffering). (Arifin & Rachbini, 2001: 145). The majority of suffering people are small and medium enterprises that consist of middle and lower class people. Their business should be fully supported by the government with full attention and facilities.

Indeed, the Democratic Economy has been raised from the start as an economic system that sided with the people, from the people and for people's welfare. The people will be actively involved in the implementation and function as state control. It is the people who are the main actors and also the determinants of the success of the program. The function of the government is only a facilitator who provides facilities needed since the key problem is the limitations of business facilities, both material and non-material. The realization of this Popular Economy is Micro, Small and Medium Business Enterprise. Micro, Small and Medium Business Enterprise is regulated based on Law Number 20 of 2008 concerning Micro, Small and Medium Enterprises. The role is very important for the survival of a country. Tambunan (2009: 4) says, it is not surprising that, in almost all developing countries, the government has development programs for MSMEs. International institutions, such as World Bank, ADB, World Organization for Industry and Development (UNIDO) and many donor countries through bilateral cooperation are also very active in building MSME capacity in developing countries.

B. Political Systems and Peoples Economic Programs

There are two economic systems that apply which are the traditional economic system and also the modern economic system. Professor Boeke's theory of economic dualism (Yu, Huang, Chen, Pan, & Guo, 2015: 43) is based on social reality. In Indonesia, it is still working together with two economic systems, namely the traditional economy and the modern economy. Traditional economics with characteristics are more oriented towards fulfilling their own household needs and tend to be local scale. The main actors in the traditional economy are small businesses. Whereas, the modern economy is more oriented to meeting market needs, both

domestic and international markets, many use modern methods to conduct their business, including financial system support. Micro, Small and Medium Business Enterprise as a traditional form of economy that still survive today certainly cannot be seen with one eye. Through the Cooperative Trading House Program, the government provides the widest opportunity for Micro, Small and Medium Business Enterprise players to develop their businesses.

The modern economy is dominated by business people with the segmentation of medium and large businesses. At first, the two economic systems did not interact, they walked on their own paths. However, along with the increasing number of capital inflows into the modern economic system, the activities of modern economic business actors began to explore traditional economic areas. The market penetration of the modern economy has entered into a traditional economy, which has slowly but surely led to increasingly limited space for traditional economies which have finally lagged behind the modern economy. (Rachbini, 2001: 153). The implementation of the Democratic Economy Program absolutely depends on how the political situation has occurred in Indonesia. The program will not be achieved if the political and legal system in Indonesia does not work well, because they are related to one another. On the one hand, the government must have decent rules and be firmly implemented to eliminate the monopoly domination of the big capitalists that control the upstream and downstream of the economic rotation of a region.

Apparently, the economy is dominated by a number of large conglomerates since government control is still weak towards implementation in the field and conditions that occur below. However, the success of the implementation of the Popular Economy Program through any form of program is the responsibility of the government. The government is the main key in managing all parties involved in the economic process in Indonesia. The law and regulations that have been issued and enforced by the government shall also be followed by supervision and good transparency, so that people's economy can be realized properly. Normally, the political situation affects various kinds of implemented and enforced policies related to Micro Small Medium Business Enterprise in Indonesia.

C. Digital Marketing Cooperative Trading House Strategy

Social media is a tool used for online marketing easily and cheaply. Today, small children, adolescents, adults and even parents exist on social media, so their presence is very beneficial for sales.

Digital Marketing was known for the first time in the early 1990s and became a major strategy that was widely applied in the business world in 2014. Digital marketing is an embodiment of the application, use or utilization of technology in the marketing process, which occurs in several stages, as follows (Ryan, 2014: 4): New technologies. Technology began to be

recognized and prioritized in the world of marketing, innovative marketers has carried out exploration and breakthroughs to be able to improve the functionality or usability of technology in achieving marketing to reach targets. Therefore, technology is the main strategy and is adopted as a standard marketing practice.

The steps above show how technology underlies the birth of the concept of digital marketing; however, technology is only a tool. From a marketing perspective, it is a connecting tool that improves the effectiveness of relations between people, especially marketers and markets (target) (Ryan, 2014: 4). Digital marketing is not a concept that focuses on technology, but on humans (marketers), namely how to understand humans (marketers), how technology is used to build relationships with other humans (customers), and how to build and significantly increase sales (Ryan, 2014: 12)

The decision to implement digital marketing as a business strategy must be adapted to the characteristics of the business being run as a basis for asserting the level of need for the future strategy. In simple terms, there are two types of business characteristics that must be recognized in determining to use digital marketing, namely (Ryan, 2014: 23):

Identify the characteristics of customers/prospective customers. In this case, there are two types of customer characteristics, namely customers who have been active in online activities, or customers who will be active in online activities. If the customer is a party that uses digital technology in finding or buying products and services offered, the use of digital marketing is the best choice. Conversely, if the customer does not need the use of digital technology, it is not necessary to use a digital marketing strategy. However, if there are customers who have never used it, it does not mean they will not use and be potential customers in the future. Therefore, the use of digital marketing still needs to be considered as a marketing strategy with long-term targets.

Recognize the suitability of product/service/brand characteristics with digital marketing. Almost all types of products/services/brands can be sold online. This principle underlies the argument that there is no need for special characteristics to be able to sell goods through digital marketing strategies. The main concern is only on customer factors, as in point 1 (one) above, that if there is online interaction with customers, all types of goods / services can be offered through the application of digital marketing strategies.

Based on the analysis of the two characteristics above, it can be decided to implement a digital marketing strategy with the stages of determining the best strategy and the first step in laying a digital foundation in the form of identification of business, competitors, customers, business targets and progress (Ryan, 2014: 24).

1. Business identification

The first step is to advise Micro, Small and Medium Business Enterprise to identify business and to explore business conditions based on several aspects, including aspects of business readiness to adopt digital marketing, conformity of products with online promotion methods, availability of technology, capabilities and infrastructure to support digital marketing, how to integrate digital marketing into business processes , and readiness of human resources from Micro, Small and Medium Business Enterprise for changes in marketing models due to the application of digital marketing.

2. Identify competitors

Micro, Small and Medium Busineess Enterprise should be able to identify competitors by analyzing the competitor's condition based on several aspects consisting of clarity about the number and who are competitors in the digital market, the connection between competitors in the digital market and the offline market, the advantages and disadvantages of competitors, the analysis of product and service uniqueness compared to competitors and broad range of competitor analysis.

3. Customer identification

Customer identification is done by analyzing several aspects, including the clarity of who the customer is, what the customer wants, the target customer, how to use digital technology by the customer and the method of using digital technology to reach customers.

4. Identify business targets

Micro, Small and Medium Business Enterprise should be able to determine business targets which is very important as a benchmark and a source of motivation to improve in order to achieve the target level according to the target. Therefore, the most appropriate digital marketing strategy must be applied in accordance with the specific business targets. Identifying business targets in this case needs to analyze several aspects, including the results from the application of digital marketing strategies, and clarity of measurements and realistic results.

5. Progress identification

Micro, Small and Medium Business Enterprise should be able to identify the progress that has been done. One of the advantages of digital marketing is the ease of measuring results obtained, compared to other marketing strategies. Every activity and progress achieved in digital marketing can be traced and adjusted to the target set to find out the level of achievement obtained. The identification of this progress can be done by analyzing several aspects, including the preference of digital channels that are more profitable (advantages in this form traffic/density of visitors), the reason that makes a digital channel more crowded than other channels, and the impact of increasing traffic on the tangible value of business.

The process of determining the digital marketing strategy above requires an in-depth analysis of the business with the main goal of finding the critical points owned by the business and can be unique and have high competitiveness in the market, as well as the most appropriate methods of integrating digital marketing strategies for maximum results according to the target set (Ryan, 2014: 26). Analysis of internal aspects in determining digital marketing strategies plays a central role in the successful implementation of these strategies. However, other things that should not be forgotten are related to external conditions which also need to be analyzed, mainly related to customers from the digital market who are the main target of the business. Basically, customers are the same, both those involved in the process of buying and selling offline and online, and have expectations for a number of things as follows (Ryan, 2014: 30):

1. Media from digital marketing that provides convenience for customer use. When a customer feels that the media used is comfortable, the customer will be able to use it more effectively and efficiently. This will make customers feel the speed of access in finding the desired needs and tend to find them faster.
2. Features of digital marketing media that are user centric. Digital technology allows customers to be one of the parties that contribute to product formation. Providing media that can accommodate customer desires in terms of these contributions will increasingly make customers feel that they have control over the product through the feedback provided which will give positive value to customers.
3. Speed of service. One of the main benefits of the existence of digital technology is the provision of time efficiency for customers in finding and getting the desired product or service. Therefore, the faster a product or service is presented, the more customers will feel fulfillment of their expectations due to the value of their time.
4. Product quality. Digital technology makes competition between products and services increasingly stringent since customers can easily get many choices for one product or service that they want to compare and choose the one with the best quality. This shows the increasing importance of product quality in digital marketing strategies in terms of building customer's satisfaction, trust and loyalty.

Customer satisfaction is a situation when the usefulness of a product or service meets or exceeds customer expectations (Irawan, 2002: 3) and digital marketing strategies are able to fulfill the four elements above to satisfy customers. Customer satisfaction in this case is satisfaction in communication, because digital marketing strategy is basically a strategy implemented in terms of communicating brands (products and services) from a producer/seller/company to customers through digital communication channels (for example, internet, email, mobile phones, digital TV) and information technology (Merisavo, 2006: 6).

Brand communication can be understood as communication between brands and customers, which is the basis of the activity in terms of forming and building brands on customers, as well as building customer relationships. The use of digital media in these activities can provide many advantages because the advantages possessed by digital technology allow instant two-way communications between producers and customers, where customers can choose, order, respond and even file complaints directly wherever and whenever. The important point of the superiority of digital technology is in terms of the high frequency of communication or interactions that occur between producers and customers with a rapid information distribution process, which shows the existence of high frequency brand communication (Merisavo, 2006: 8-9).

Ahmed (2014) mentions in his empirical study that brand communication is one of the causes that make customers become loyal and trust a brand. They are willing to pay for a product at any price. Thornanto, Sugiarto, & Sitinjak (2004: 126) stated that brand loyalty shows attachment between customers and a brand. Durianto, Sugiarto, and Budiman (2004: 19) also stated that brand loyalty is the result of the accumulation of customer experience (satisfaction) in using a product. Furthermore, Donio, Massari, and Passiante (2006) cited the opinion of East (1997) and Ehrenberg et.al. (1997, 2004), that brand loyalty is the result of repeated satisfaction felt by customers for brand utility.

The explanation of brand loyalty and brand satisfaction above leads to the connection between brand communication and brand satisfaction, which in this case is motivated by the use of digital marketing strategies with various information technology applications. Below is a chart of very monthly sales from Cooperative Trading House by using both online (digital marketing) and offline (store) strategy.

2018 Sales Charts Every Month Cooperative Trading House

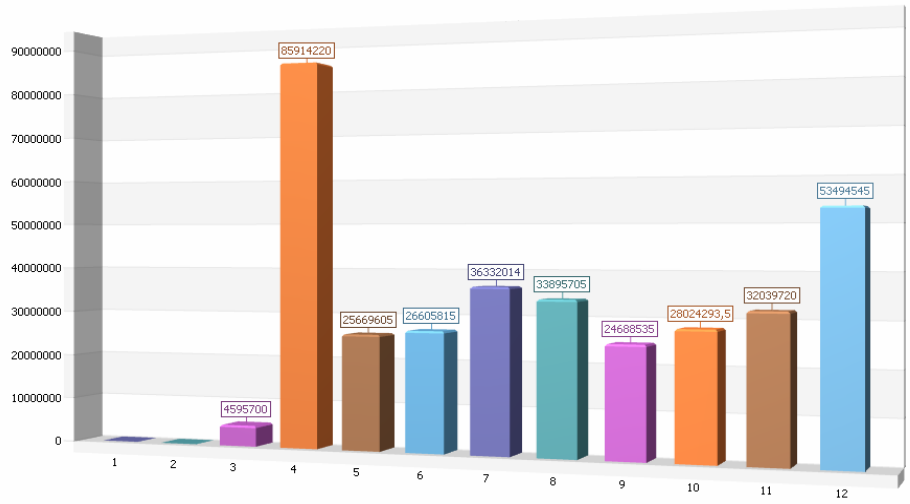

Figure 1 2018 Sales Charts Every Month Cooperative Trading House

2019 SALES CHARTS EVERY MONTH COOPERATIVE TRADING HOUSE

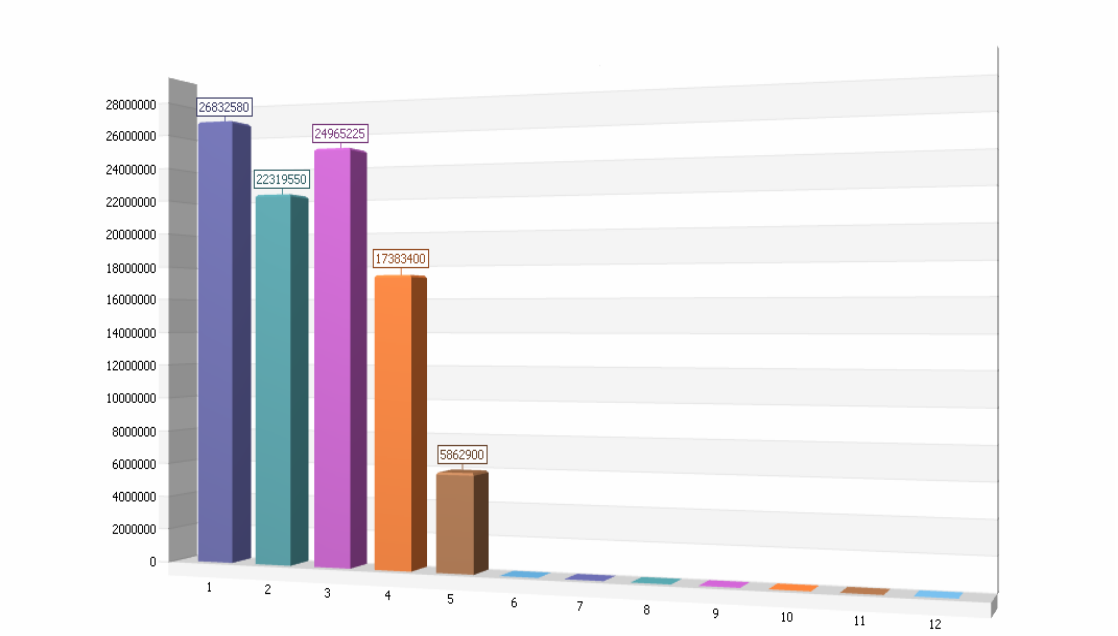

Figure 2 2019 Sales Charts Every Month Cooperative Trading House

Conclusions and Recommendations

From the discussion above it can be concluded that digital marketing strategy carried out by Cooperative Trading House are the programs that must be continued and carried out as a form of concern for the East Java provincial government towards Micro, Small and Medium Business Enterprise actors.

Digital Marketing Strategy is a marketing strategy that utilizes increasingly developing information technology. The implementation of these strategies in a business must be taken into account regarding various internal and external factors to determine suitability and to determine the most appropriate Digital Marketing strategy. The main objective of implementing the Digital Marketing strategy is to establish communication between producers and customers, more precisely to communicate the brand in building brand trust and loyalty to customers. Loyalty is the result of the accumulation of repeated satisfaction, so that conceptually the connection between the application of Digital Marketing strategies can be drawn to increase customer satisfaction.

The previous sales charts, which shows the monthly sales from the beginning of Cooperative Trading House in 2018 until 2019, shows that there is an increase amounts of sales for Micro, Small and Medium Enterprise in several months and it is occurred both from online/digital marketing and offline/store marketing. The support from Cooperation Trading House for Small and Medium Business Enterprise is still in need as well as subsidy for Micro, Small and Medium Business Enterprise players, which will not be too costly. Cooperative

Service also needs to make an agreement with the tourism board, so that tourists who visit Surabaya can also visit CTH Store to find souvenirs from East Java Province Indonesia. Cooperative Trading House also needs to create a more attractive website and social media in order to attract followers to get to know authentic products of east java province in an easier way.

Cooperative Trading House through Cooperative Service also has to shorten the procedures and requirements to be a CTH member, which helps increase more various products from Micro, Small and Medium Business Enterprise.

Cooperative Service also needs to train the players of Micro, Small and Medium Business Enterprise to have they own social media as well as digital marketing through their own website. Therefore, the revenue sales are not only from offline stores but also online stores.

Cooperative Service must also provide an exhibition in public place for promoting products from East Java Province in particular, which can be a trigger for Micro, Small and Medium Enterprise to be more creative and attract buyers.

Exporting the products of East Java Province Indonesia is also an assignment for Cooperative Trading House as well as Cooperative Service to find a potential buyer from foreign country who is willing to accept the products and promote world wide.

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2D Simulation for Solar Power System Load and Harvest Computation

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Abstract

Philippines education is deteriorating and left behind to its neighbors and to the international spectrum. CHED Memorandum Order No. 35 requires an institution to prepare well-structured, well-written and well-tested instructional materials for each course. With the efforts of the local government, the advancements of local educational institutions, corporate social responsibility initiatives of corporations and the individual pursuits of Filipinos for personal empowerment through education, there is a rise on the number of innovators, researchers and knowledge producers in the country. This descriptive-developmental research study created and developed a 2D simulation of a solar power system with an acceptable software standard that contributes to a learning process and contributes to the acquisition of new knowledge. This study also determined the level of awareness to the use and implementation of a solar power system, designed and developed an android application named solar power load and harvest estimation and evaluated the developed system to obtain standards in terms of functionality, reliability, usability, efficiency, maintainability, and portability. Findings revealed that the developed system provides a supplemental tool in enhancing the learning process of students on difficult topics in basic electronics. Findings further revealed that the supplementation of the system is more effectively valid, reliable and functional than the traditional methods.

Keywords: Solar Power, Electric System, Simulation, Education, E-learning

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Introduction

Philippines education is deteriorating and left behind to its neighbors and to the international spectrum (Plaza, 2018). Changes in culture and learner's environment could have led to this drastic change in the educational system. This study emphasizes the integration of educational media as imperative pedagogy to a modern learner. The CHED Memorandum Order No. 35 requires an institution to prepare well-structured, well-written and well-tested instructional materials for each course (_____, 2016). The Commission recognizes that acquisition of higher learning takes place both within and beyond the classroom.

With the effort of the local government, the advancements of local educational institutions, corporate social responsibility initiatives of corporations and the individual pursuits of Filipinos for personal empowerment through education, a rise on the number of innovators, researchers and knowledge producers in the country may not be a problem anymore in the near future. The commission aimed to develop and maximize the edge of learning. Through the new technologies today, the acquisition of higher learning is not impossible even in the power industry.

A lawmaker has said that along with the need to have a more stable power supply in the country, this should be clean, cheap, and effective (CNN Philippine, 2018). According to Mike De Guzman, Solar panels have begun to make so much "economic sense" (Randa, 2014). This concept served as basis and reference in the initiation, conceptualization, design, development, and implementation of the proposed system.

The proposed system is developed to create an awareness and knowledge acquisition of solar power system using a 2D simulation of the basic function and operations. The proposed system aimed to provide education and aid to the PV installer, solar power user or customer and anyone who are in the study of renewable resources.

With its user-friendly design, the user can easily find its ways to learn and use the simulation without having actual materials and equipment. The whole simulation is guided by known electrical theory and standard used in today's practice. The result of the evaluation is perceived to help the respondents in simulating the needed solar panel to sustain the needs for a day, to specify a panel specification and allow simulation of loads applicable until the maximum limit of harvest.

Congressional Commission on Education to Review and Assess Philippine Education (EDCOM) 1992 and PCER 200 found that the quality of the educational system is deteriorating (Academia, 2019; Philippine Agenda for Educational Reform, 2019). According to David Warlick, technology is needed in every classroom and in every student and teacher's hand. It is the pen and paper of today's time, and it is the lens through which one experience much of the world. The integration of new technology as learning materials and teaching strategies fuel the mind of today learners (David, 2017).

Computer simulation will be the medium to connect to the "real world": with a safer, cost-effective and elimination of time constraint, a simulation program is a useful tool for wise decision making. Promoting learning that touches the interest of the learner. As Ken Robinson said, "People often achieve their own best work at a personal level when they connect with a particular medium or set of materials or processes that excite them" (Wendelberger., & Wendelberger, 2009).

There are practical reasons to use simulations but there are also reasons that have a direct relation with the learning process. Compared with real system experimentation, simulations have several advantages (Genalyn, 2017). A creative way of teaching a difficult subject can be made easy and enjoyable with the use of computer simulation. It is inquiry-based learning that a student learns through manipulation of event or experimentation in a computer simulation. Being educated is the still most practical approach to uplift individual upbringing and statuesque. Using tools to further enhance once learning capability such as computer simulation would greatly help to aid the craving for wisdom and enlightenment.

The President Rodrigo Duterte of the Philippines made the commitment during the inauguration of Solar Philippines' first solar panel factory in Sto. Tomas, Batangas. Duterte said in his remarks, "I thank Solar Philippines for its efforts to advance the country's solar energy industry. The establishment of the state-of-the-art facility in Sto. Tomas, Batangas is timely and relevant as we address the increasing demand for renewable energy. Rest assured that we in government shall continue to support the development of renewable energy in the country" (MATEC Web of Conferences, 2016).

An efficient source of electricity is necessary to nations economic growth were most of the industries rallies on electricity and aid to people living in segregated areas of the region like a demographics of the Philippines. Home-based solar power systems may not produce enough current for a fridge, but they can supply each home with a few lights, a mobile-phone charger, and if the household can afford it, a small, super-efficient flat-screen TV (Ralph, 2011).

Aside from its portability and being environment-friendly solar power is also becoming more popular to industrialized nations like Germany, Sweden and other. Germany, being part of the Paris climate conference make, Germany become the Europe green leaders making its way to be the first country to rely on renewable energy (Lean, 2013). In terms of the general cost, coal plants require around $0.067/kWh compared to $0.07/kWh for solar data from CEPALCO 1-MW PV showcase project (De Jong & Van Joolingen, 1998). With its environmental benefits and increasing market prices are also going down making it more affordable. Filipino needs further enlightenment and removal of skeptical thinking that solar power system is expensive. Making it as a common knowledge will make a great impact on

today's new generation to save the environment and easy access to basic needs like proper lighting and electricity.

This study created and developed a 2D simulation of a solar power system with an acceptable software standard that contributes to a learning process and contributes to the acquisition of new knowledge. This study also determined the level of awareness to the use and implementation of a solar power system, designed and developed an android application named computing solar power capacity estimation and evaluate the developed system using industry accepted quality standards in terms of functionality, reliability, usability, efficiency, maintainability, and portability.

Review of Literature

Computer Simulation was used for educational purposes. Easy Java Simulation was used to address the learning difficulties in Newton's 1st and 3rd Laws through problem-based inquiry (Goh, Wee, Yip, Toh & Lye, 2013), the implementation of computer simulation as one of the teaching tools in physics cause a reasonable increase in student learning capabilities resulting to 95% confidence level of the student. Enhancing simulation to motivate all the students to improve their learning will lead to a successful learning experience.

This study also augments reality through 2D simulation relevant to the above-mentioned statement that will induce the students not to settle for less but to learn more about this kind of software technology that will lead to a victorious learning output.

In the study “P Effectiveness of Simulation and Computer Assisted Instruction (CAI) on the Performance of Students under Regimental Training on Selected Topics in Physics II” (Barlis & Fajardo, 2013), concluded that Simulation and CAI maybe be to amplify the teaching style in the classroom, thereby a simulation proposed by the researcher may also be an effective avenue for a student to advance their learning capabilities.

The proponent also agrees with Barlis that CAI enhances students’ learning in the classroom and makes progressive learning leading to inquiry-based learning. The presence of multimedia content greatly affects the student learning styles if teachers and educators apply technology in out-of-classroom environment.

Nowadays, the international movement on environmental concern has been implemented throughout the world, such as the use of solar technology. Sweden made it up to world's first nation to go 100% fossil fuel free, they have reckoned to solar, wind, energy storage, smart grids, and clean transport in the year 2015 (Romson, 2015). This movement continuously encourages other members of the Paris Agreement to follow the lead towards low-carbon emission. This study will contribute to the Philippines awareness campaign through the knowledge it contributes to the user of this simulation software. The proposed study also gives a wide view of how to use solar power technology in a small household.

Germany breaks a solar record by getting 85% of electricity from renewable energy. European countries keep on taking the lead in promoting renewable energy on the planet. Even though solar power may not be the top provider of renewable energy, it is the most affordable among the other indigenous sources of electricity (Hanley, 2017).

On April 22, 2016, Chen has formally signed the Paris Agreement (Chen, 2017), showing the country's recognition about the importance of limiting the carbon emission. Paris Agreement is an international movement aims to limit the emissions of carbon, and the majority of our carbon emission is from fossil fuel energy production. It is a disclosure to look at those energy resources with no carbon emission like solar power.

The current study also supports the Paris Agreement by promoting low carbon emission through the use of the proposed study. This will contribute to the growing popularity of solar technology. Likewise, it supports the National Disaster Risk Reduction & Management in use of the non-carbon emitting source of electricity like solar technology.

Education is the key to success and a solution to poverty. Sindh Governor Dr. Ishratul Ebad Khan said that "progress is not possible without attaining excellence in the realms of education" (Daily Time, 2016). This statement came from the Governor of Pakistan. Adding to it was a promotion to align school curriculum with the present day needs. As the researcher strongly suggests, education, new technology and interest to renewable energy must be incorporated with one another.

The researcher also agrees with Sindh that education is the key to poverty; technology has always been available for use. This study will provide learning without having to buy the actual material and equipment for solar technology but through the simulation program. The researcher proposes that the information dissemination of this newly available technology is necessary for the nation's growth.

Internet and education have become inseparable as it has become a way of transferring data and information instantly (Sharma, 2016). The Internet brought a great impact to all the students. Multimedia integration, online collaboration, and 2D or 3D animation have been parts in teaching a wide range of subjects in school, professional supplementary training and others that may help to improve the learning of the student and the teachers. This concept is relevant to the current study, for it is considered as multimedia by the use of a 2D environment to express a more interactive learning experience. The researcher used 2 Dimensional platforms in the creation of the proposed study to make it more compelling to the user and to be considered as multimedia content.

Mindflash quoted that "Education is the premise of progress, in every society, in every family" (Annan, 2017). With the advanced technology today, E-learning is not rare. Through E-learning, educators will have a creative and innovative teaching strategy. The idea of Mindflash is relevant to the study because it uses e-learning technology to disseminate

information, thereby contributing to the growth of the nation in the long run. Likewise, the researcher also believes with the idea of Anan that education can bring progress in society.

A Computer-Based Business Ethics Simulation Game is centered towards the development of intellectual quotient with the use of strategy development through simulation game (Buck, 2017), through this kind of simulation, it will help the business sector to avoid possible mistake and assume a real-world situation to solve problems. The concept of the said study is relevant because the current study is similar to a simulation game. However, it focuses on solar technology rather than on business ethics. Through the use of the simulation, future mistake in the field can be avoided.

Laping said that one did not need to become a computer expert to use technology in the classroom. Instead, it was one's willingness to innovate and time to explore every possibility presented at one's doorstep (Laping, 2016). It is big lip for teachers to use online sources, computer application and other technologies to expand our horizon in learning and continuously elevate our living. The idea of Laping is significant to the current study because this study also upholds an innovative teaching strategy for a Filipino teacher along with the integration of technology in the classroom which is a must in today's educational system.

According to Butuyan, education has enabled and continues to enable multitudes of people to escape from poverty. Education is poverty's most effective antidote (Butuyan, 2016). Education has always been the solution to poverty; however, ample amount of money is still needed for a person to acquire better education. The researcher strongly agrees with Butuyan that education is the way to escape from poverty. Moreover, technologies maximize the learning process in a short period of time such as E-learning materials that can supplement the learning process or as a self-study material in the absence of teachers.

Torm Basic Safety Train-learning tool used for maritime business in teaching safety among each member, considering the danger or failure in the actual scenario (Gregilo Lomboy, 2019). With 2D e-learning tool, lots of maritime business can avoid such an incident because 2 Dimensional in the e-learning process of maritime business increases safety in the field. The idea of using 2D animation to provide basic safety training is also significant in the current study. The proposed study also used 2D interface to promote safety.

E-Learning for agriculture and fisheries is an online website by the Philippine Department of Agriculture's e-Extension Program that provides online training in collaboration with the other governmental agencies and non-governmental sectors (E-extension, 2017). This is another avenue for agriculturists in every corner of the nation to enhance their knowledge and skills. E-learning has been a great help in numerous fields to give affordable education. Thereby, this is relevant to the current study because it has a similar principle of making education affordable and easy to all willing individuals.

Department of Energy (DOE) stated that during the 2016 power statistic survey, the country's power consumption is 90,798 Gigawatt/hr, 47.7% of which is from coal plants, 6.2% oil-based, 21.9% is natural gas and 24.2 % from renewable energy with 1.2% coming from solar power. This data is the overview of the country's power consumption. It is expected that the need for vast electrification will increase, resulting in higher needs for power generation. With 1.2 % power generation coming from solar power, it shows that the country is not yet maximizing its full capacity and potential (DOE, 2017).

The researcher concludes that, according to the DOE report, the renewable energy is slowly contributing to the growing need for energy consumption in the region. Furthermore, the use of this research will be more beneficial as the country promote the use of renewable energy resources. The growing popularity of this technology gives interest to the researcher to make this study an avenue to cultivate an appreciation of solar energy.

Solar power popularity continues to rise in the passing of time. In 2014, SM North Edsa Quezon City became the world's largest solar-powered mall with 1.5-megawatt plant capacity. In 2015, Robinsons Place Palawan mall installed 4,710 solar panels on their rooftop covering 20% of their electric consumption. On March 3, 2016, Southeast Asia's biggest solar farm opens in Negros Occidental with 132.5 megawatts solar farms (Espina, 2017). This spreading use of solar technology of big establishment is significant to this study as it shows that there is a lot of potential for wide application of the software with the growing market demands in Southeast Asia and the world.

To support the education of a public school in Tanay Rizal, First Gen Corp. donated a solar power system powering charging stations for laptops and other gadgets, lighting its rooms and school perimeters (PhilStar, 2017). Through the support of First Gen. Corp, E-learning is not impossible to all the students of Tanay, Rizal. It will improve and expose learners as well as educators in the world of technology.

Quismorio stated that 1.5 kilowatts of power are enough to power a light bulb at night for each of the 30 households in one sitio with Aeta's tribes in Tarlac. They have received a P320.00 worth of solar power system from Project Liwanag, a non-profit organization with the mission to improve the lives of indigenous people (Quismorio, 2017). This organization has a great contribution in lighting up homes and in giving a better hope for education to the indigenous people.

Quismorio's statement is significant to the current study because the proponent also believed that solar technology is a breakthrough to power shortage in low lying areas. The capability of solar power system as an independent power source makes it possible to reach the far-flung corners of mountains and provinces of the nation's giving lights, not just lights but an opportunity in education and safety.

Republic Act No. 9513, known as Renewable Energy Act of 2008, mandates the policies of the state to promote renewable energy resources and establish the necessary infrastructure to reduce the country's dependence to fossil fuels (_____, 2018). The effort put into this research will not be wasted due to growing demand of renewable energy in connection to the state law. Moreover, we cannot continue to rely on fuel as the major source of power. The researcher of this study aims to give awareness and knowledge to solar power, one of the well-known renewable energy sources.

Energy Flexibility in the Power System: Challenges and Opportunities in Philippines. Energy flexibility can address the challenges of large-scale integration of renewable energy resources and thereby increasing the imbalance in the power system (Billanes, Ma, & Jørgensen, 2017). It upholds flexible power system that can provide reliable supply, low electricity cost, and sustainability. The adoption of flexible solutions, such as flexible electricity generation, demand-response, and electricity storage, has a great factor and influence to society.

Both studies addressed the significance of flexibility in the power system because it provides reliable supply, low electricity cost, and sustainability, yet the present study provides a load and harvest module interface. Load module allows user to specify 1-14 loads and the program will simulate the needed solar panel to sustain the needs for a day to the specified load. While the harvest module allows user to select 10 to 310 Watts, solar panel and its quality will lead to the harvest estimation for the day.

Evaluation of Possible PV System Solutions for Streetlight´s Care Center in Tagpuro, Philippines has evaluated different photovoltaic (PV) system solutions applicable for Streetlight in Tagpuro. The evaluation has consisted of on-grid and off-grid system designs. Streetlight operates a care center in Tacloban and Tagpuro, on the Leyte island in the Philippines (Kvinen, 2017). It has a great contribution to the Philippines because this country is located at one of the earth´s most exposed and vulnerable areas considering earthquakes, volcanic eruptions, and typhoons. It will give changes to the life of every Filipino.

The above study is related to the proposed study in terms of pursuing the solutions for the problem in the power industry. However, the above study consists of on-grid system design while the proposed study is an off-grid solar power system that will provide the most efficient solar panel appropriate to the need electric consumption and all the possible load and battery capacity base on the given panel capacity.

Methodology

Research Design

This descriptive developmental research was used in the study. Descriptive research was used to gather data on the use of the developed software of the respondents. According to

Best and Kahn (2007), descriptive research employs the process of disciplined inquiry through the gathering and analysis of empirical data, and each attempts to develop knowledge. To be done competently, each requires the expertise of the careful and systematic investigator. A brief explanation may serve to put each one in a proper perspective.

Developmental research was used to describe the process of the development and deployment of 2D Simulation for Solar Power System Load and Harvest Computation.

Respondents

After the development of the software, it was pre-tested to the engineering student who was taking up a subject related to solar energy and the instructors who were handling subject related to this.

Research Instruments

Questionnaire and unstructured interview were the research instruments in the study. The questionnaire was used to evaluate the learning of the students and software acceptability using ISO 1926 guidelines. The casual interview was conducted to gather pertinent information about the current methodology used in teaching from the respondents.

Technical Resources

Table 1 shows the hardware and software requirements in the development of 2D Simulation for Solar Power System Load and Harvest Computation. The developed software used Construct 2 r2 for 2D animation and the software application is available via android phone with android OS 7.0 which makes it flexible and portable to anyone who uses the software.

Table 1 Requirements for System Development

Hardware	Software
Android Phone (OS 7.0 and above)	Construct 2 r2
Desktop Computer	Windows 7 or Above Operating System

System Development Methodology

The proposed study utilized the Iterative Waterfall Model as a guide to its software development. This system development is suitable for a smaller project that needs consistent backtracking and evaluation throughout the whole process. Figure 1 shows the system development methodology used in the study.

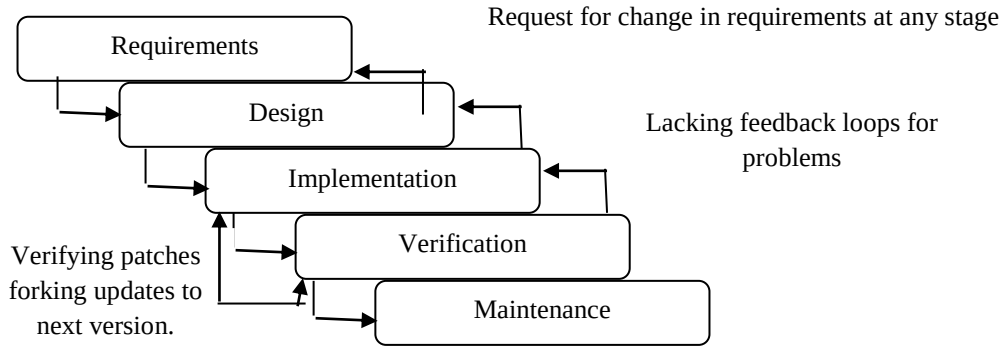

Figure 1 System Development Methodology

Phase 1: Requirement

Intensive research on different books on electricity, power plan, renewable electricity, and solar power installation was studied to be able to derive to its design and functions. Researcher's personal observation and investigation were also used in data gathering which was necessary for the materialization of the project.

Phase 2: Design

The information gathered from the previous phase was used to make a suitable interface design for the project. The aim of the researcher is to make the 2D simulation fitting to every user especially to those with little knowledge to this field; in view of this, the researcher prepared a vibrant feel for the entire project.

Phase 3: Implementation

In this phase, the researcher implemented the necessary formula and computation needed to make a complete and functional 2D simulation.

Phase 4: Verification

The project in this phase is uploaded to an android phone and check for compatibility and correctness of implemented mathematical formulas. Fault and failure are detected and debugged after having positive result. It is now ready to be used through offline by various stakeholders.

Phase 5: Maintenance

Since the project is uploaded to an android phone and it is offline, no unnecessary error may occur in the project after being uploaded.

Research Results

Designing

In the process of creating the design of the system, a series of steps was undergone. Figure 2 shows selection of 2 modules; the Load and Harvest module and about button contain the developer's credit. Tapping was used to the manipulate of the android application. The following figures were used in the aforementioned project.

Figure 2 Selection

Figure 3 shows the first part of the load menu as in figure 2. There is no specific output in the simulation since no appliances are chosen.

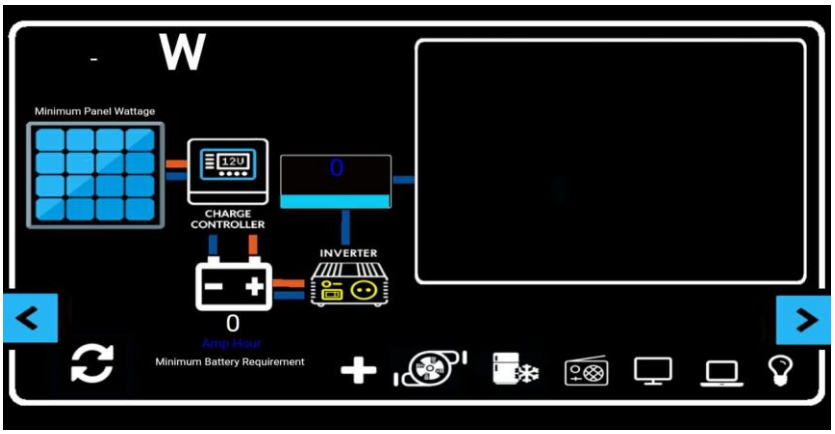

Figure 3 Load Menu without Empty Appliances Choices

Figure 4 displayed the chosen appliances with the corresponding hour use, wattage and quantity. These 3 criteria are needed for the simulation to generate the necessary panel and battery suitable for the chosen appliances.

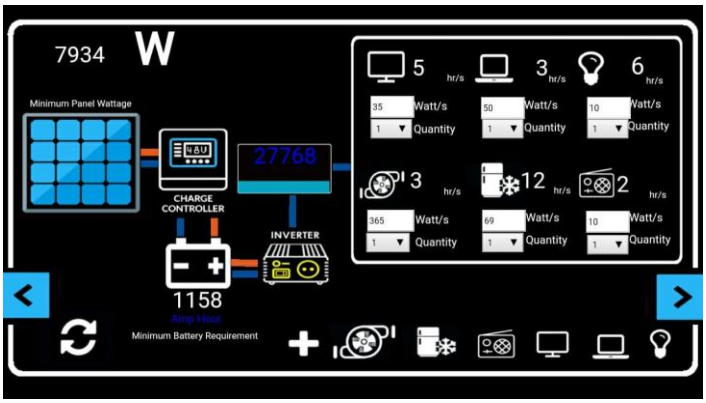

Figure 4 Load Menu with Empty Appliances Choices

Figure 5 is only accessible, when under Figure 4, where the user needs more choices of appliances to be included in the computation. Time is added by simultaneously tapping the appliances icon at the bottom and subtracted by tapping the appliances icon inside the box. There are default wattage and quantity for each appliance but the user also has the capability to modify this entire attribute.

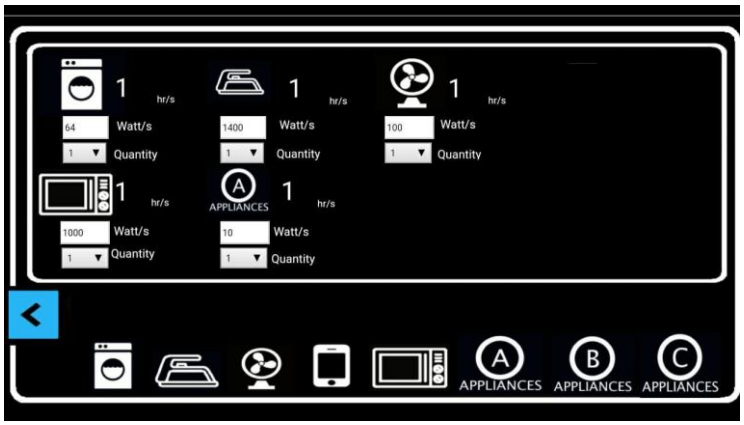

Figure 5 Additional Appliances Selection

Figure 6 is located under the harvest menu; the function of this menu is to provide the maximum load based on the gives panel wattage and quantity given by the user.

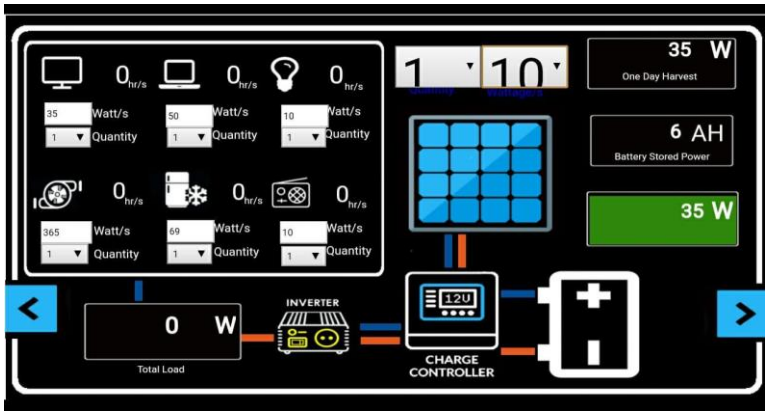

Figure 6 Harvest Menus with Selected Panel and Quantity

Figure 7 shows a sample output, where the user inputted a load that consumes almost half of all the stored energy coming from the battery highlighted by a red blinking box.

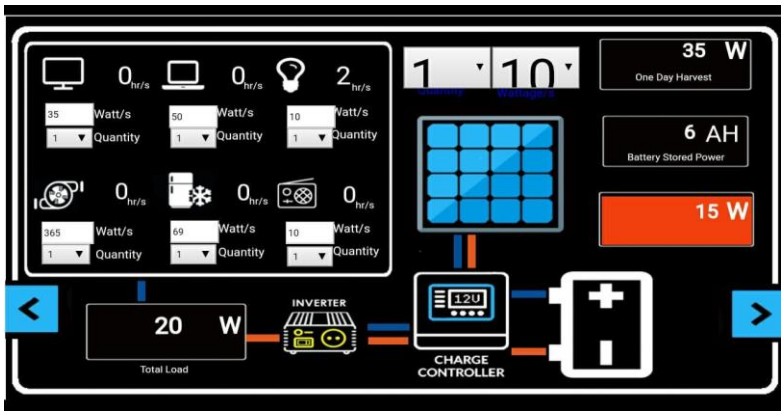

Figure 7 Harvest Menu with Warning State

Figure 8 is found under a harvest menu as in figure 4.5. There is a green colored box showing a normal state of the simulation which means the user can add more load until it reaches the maximum capacity of the system.

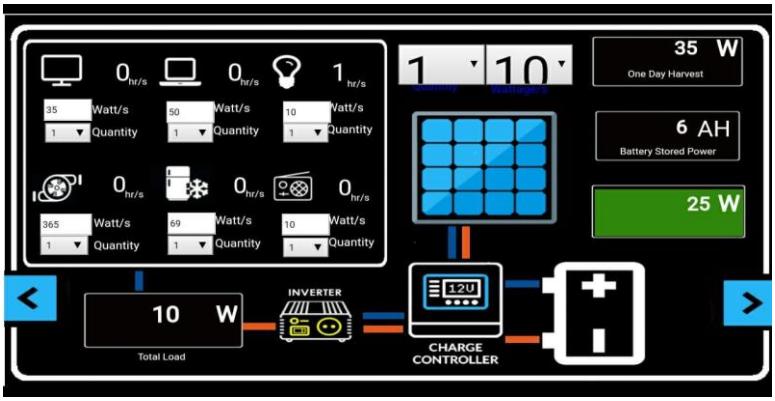

Figure 8 Harvest Menu with a Normal State

Testing

The researcher tested 2D Simulation for Solar Power System Load and Harvest Computation and determined the stability of the project. The testing is focused on the discovery of limitation and error that the project can produce during the various scenarios. Reflected in Table 2 is the summary of the evaluation and testing of the software made.

Table 2 Summary of Evaluation and Testing

Characteristic	ME	ECE	EE	Interpretation
1. Functionality	4.21	4.0	4.48	Excellent
2. Reliability	4.19	3.89	4.26	Excellent
3. Usability	4.31	4.25	4.35	Excellent

Table 2 Summary of Evaluation and Testing (Cont.)

Characteristic	ME	ECE	EE	Interpretation
3. Usability	4.31	4.25	4.35	Excellent
4. Efficiency/Speed	4.19	3.96	4.54	Excellent
5. Maintainability	4.29	4.06	4.46	Excellent
6. Portability	4.31	4.12	4.46	Excellent
Average	**4.25**	**4.04**	**4.44**	**Excellent**

The respondents are Mechanical Engineering (ME), Electrical Communication Engineering (ECE) and Electrical Engineering (EE) students rated the 2D Simulation for Solar Power System Load and Harvest Computation with regard to the given objectives of the entire module presented to them by the proponent.

Discussion and Conclusions

A system was developed to provide a supplemental tool in enhancing the learning process of students on difficult topics in basic electricity. The system evaluation shows that the supplementation of the system is more effective valid, reliable and functional than the traditional methods without damaging tools and materials for actual experimentation through the use of simulation. The system was designed to give focus on the simplicity of visual design using common icons and user-friendly graphical interface leading to more enjoyable learning. With the use of the Android phone as its platform, variety of users can access to the developed system which is applicable to PV (Photovoltaic) installer technicians, solar panel reseller and household with solar power system or those who have plans to purchase an off-grid solar panel. With excellent respondent evaluation feedback, the system is now ready for implementation.

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