

The Effects of Lean Six Sigma Projects in the Companies Operational and Financial Efficiencies

Bernard G. Sanidad¹ and Michael M. Dalimot²

University of Santo Tomas

¹bgsanidad@yahoo.com, ²mmdalimot@ust.edu.ph

Corresponding Author: Bernard G. Sanidad

Abstract : *The magnitude and turbulence of the changing landscape in the service industry have posed challenges in the many lenses of business dynamics and organizational capabilities. In the service management ecosystem, Lean Six Sigma (LSS) methodologies have been used in project deployment since the customer needs are ever changing and increasing. Today, executives and managers invigorated the business environment to champion a systematic approach since business process improvements are needed to improve performance as measured by quality, cost, delivery and customer satisfaction. This study aimed at looking at the effects of implementing projects using Lean Six Sigma methodologies to the operational and financial efficiencies in various companies in the Philippines. On the basis of the results of the study, it can be gleaned that implementing business innovations and Kaizen Projects using Lean Six Sigma methodologies can gauge and compliment the company to be Very Efficient and Highly-Efficient in almost all areas of Operation and Financial Management. Further studies could be done to investigate the overall impact of using LSS as scaffolding, process reengineering approach, waste eliminations in the businesses. Researchers recommend an analysis of Lean IT in those companies scoped in this study to improve service quality.*

Keywords: *business process improvement, kaizen project, lean six sigma, service management, service sector*

Date of Submission: 16-06-2019

Date of acceptance: 02-07-2019

I. Introduction

The many lenses of business dynamics and organizational capabilities were recognized as an inherent factor to the company's success [2]. However, in this milieu and the rise of the transformative global economy [2, 4, 5], methodical and management science approaches were to have continuously bargained [1] by most companies to continuously improve its organizational and business processes [2, 3, 6]. The natural attributes and complexity of the current and emerging trends in the business ecosystem have challenged the management to tussle market breakaway and look into the skills set with the high changing demands of technological integration into the project workspaces [7] and business process management. Continuous process improvement has turned into a need in organizations to sustain operational magnificence [2], adjustment to new plans of action, improved leadership and provide excellent customer service [5, 6], and the likelihood of surpassing competitors performance [7].

It was opined by [8] which with the changing times, and the magnitudes and turbulence in the competitive business world, the skills and expertise in Business Process Management (BPM) of the managers, and consultant were predominantly attributed to their experiences. These skills set and experiences were shaken even more by the existence of information superhighways, and the automation era whereby process improvements were needed in the workspaces. Amongst these improvements include the utilization of Information Technology (IT) in the operational and strategic level. Information technology has changed business processes within and between enterprises [1, 2, and 7]. Further and more toiled business processes are being conducted under the supervision of information systems that are driven by process models 1, 2, 8]. Although, the vision of process management is not new, existing theories and systems have not been able to cope with the reality of business processes [9], even there were information systems deployed to support the business transactions, but it was pinned by [2, 9] that if companies will put the business processes on the center stage of the enterprise, companies can generate gainful insights and capabilities needed to increase the rate of innovation.

In the service management industry, Lean Six Sigma (LSS) methodologies have been used since the customer needs are ever changing and increasing [2, 6, and 18]. It was exemplified by many executives and managers to champion a systematic approach since business process improvements are needed to improve performance as measured by quality, cost, delivery and customer satisfaction [18, 19]. Lean Six Sigma methodologies have been used as statistical techniques to embark with a systematic way to reduce variation in the performance [10] and improve processes in the operational and strategic levels [10, 17]. These methodical

approaches are also utilized to develop a stronger focus on results [resulted-oriented) including customer needs (customer-centric) organization [10, 16, and 6]. Also, LSS underpinned by many scholars as statistical techniques that presents a structured and systematic approach to process improvement [6, 11, 33], while Six Sigma has long been seen as a statistics-heavy, technical approach to process [6, 11, 12].

Six Sigma is also defined as a multifaceted, customer-oriented, structured, systematic, proactive and quantitative philosophical [15, 19, and 16]. Most organizations who are championing systematic approaches have embarked and deployed Kaizen projects with integrated Lean Six Sigma methodologies. It was coined and posited that both Lean Thinking and Six Sigma provide systematic approaches successfully facilitated to stimulating the employees of the companies, started ideation, and increased the rate of innovations needed to improve the operational efficiencies and quality [14, 6, 15, and 16]. By championing Kaizen projects undertaking using a systematic review approach the employees and management become aware of the breadth of customer service, the foundational and core values of their culture [6, 13, 33] and reengineered their respective business processes and services.

II. Background and Objectives of the Study

The service loyalty, with its final effect on repurchasing by customers, seems to have received relatively little attention [28], and in order to cultivate service loyalty, a company offers a product or a service [6, 25]. A product is commonly anything which is offered to a market in order to gratify the customers want or need [6, 25]. A service in a business note is another type of product provided by the service industry to the general population or business firms. Every business thrives to get customers, provide unique value to the customer and in the market, keep the customer and the market, and sustain over time [23]. In order to sustain the customer and the market over time, companies should emphasize the need to look into the service quality and customer service. In [26, 27] it was described that quality has come to be recognized as a strategic tool for attaining operational efficiency and improved business performance, thus resulted in customer satisfaction [22, 24, 32].

However, today, quality improvement is still a battle cry in the service industry since most companies are limited to" conformance to technical standards [6, 23, 27]. Although the deployment of business innovations using Lean Six Sigma methodologies are relatively new, there have been companies advocated and championed the willingness to implement global practices (glocalization) [20, 21, 31] and look for ways to cut down on steps within processes without jeopardizing system integrity [21, 22]. This study presents the effects of implementing projects using Lean Six Sigma methodologies to the operational and financial efficiencies in various companies in the Philippines.

III. Methodology

The researchers utilized a Descriptive Quantitative research design. A Descriptive Secondary Data Analysis [29, 30] was also utilized to look at the nature of the projects, duration and descriptions, teams and other artefacts as supplementary data to the Survey Questionnaire floated online using a Survey Monkey application [29, 33]. The respondents were purposively selected using the criteria: an employee working in the company within Metro Manila, the company is under the service sector and a company with deployed projects using Lean Six Sigma methodologies. Data gathered was treated using Descriptive Statistics.

IV. Results and Discussion

This section presents the data gathered and analysis conducted by the researchers. It presents the demographics of the respondents according to their, Roles, Role in the Project, Type of Company, Tenure in the Company, location of the company, and the Lean Six Sigma Champions in the Company. The other part of the discussion includes the effects of implementing projects using Lean Six Sigma methodologies to the companies.

A. The Demographics of the respondents according to their Roles in the company

Based on the data gathered, there are 15/30 or 50% of the respondents are working as Support team members of the company, while there are 7/30 or 23% of the respondents are Managers, 3/30 or 10% of the respondents are Directors, and 5/30 or 17% of the respondents are working as Consultants as depicted in Table 1 and Figure 1.

Table 1.The Distribution of the respondents according to their Roles in the company

Roles	No. of Respondents	Percentage
Support	15	50%
Manager	7	23%
Director	3	10%
Consultant	5	17%
Total	30	100%

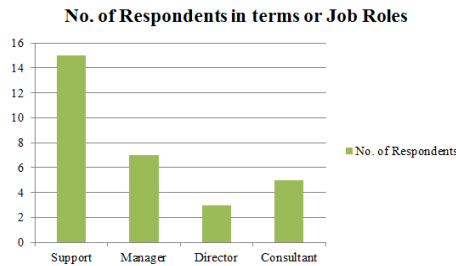


Fig 1. The Distribution of the respondents according to their Roles in the company

B. The Demographics of the respondents according to their Role in the Project

Based on the data described in Table 2 and Figure 2, there are 10/30 or 33% of the respondents who are Team Members of the projects deployed, 8/30 or 27% of the respondents are Implementer, 7/30 or 23% of the respondents are Project Sponsors, and there are 5/30 or 17% of the respondents who are Project Mentors.

Table 2. The Distribution of the respondents according to their Role in the Project

Role in the Project	No. of Respondents	Percentage
Team Member	10	33%
Implementer	8	27%
Sponsor	7	23%
Mentor	5	17%
Total	30	100%

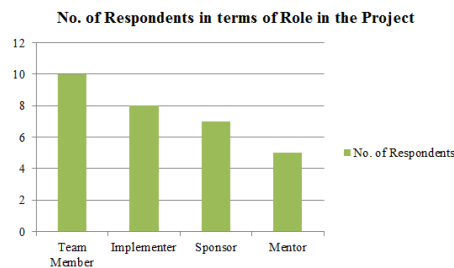


Fig 2. The Distribution of the respondents according to their Role in the Project

C. The Demographics of the respondents according to the Type of Company

According to the data gathered, the employees work for the Contact Center or Call Centers are 6/30 or 20% of the respondents, 7/30 or 23% of the respondents in the Business Process Outsourcing, 15/30 or 50% of the respondents work in Information Technology Outsourcing, and 2/30 or 7% of the respondents work for Consultancy companies as described in Table 3 and Figure 3.

Table 3. The Distribution of the respondents according to the Type of Company

Type of Company	No. of Respondents	Percentage
Contact Center	6	20%
BPO	7	23%
ITO	15	50%
Consultancy	2	7%
Total	30	100%

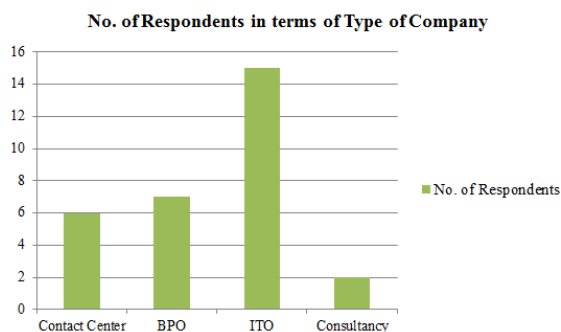


Fig 3. The Distribution of the respondents according to the Type of Company

D. The Demographics of the respondents according to their Tenure in the Company

Table 4 and Figure 4 reveal that the respondents have been working for at least 0-3 years are 12/30 or 40% of the respondents, 7/30 or 23% of the respondents for 4-6 years, 8/30 or 27% of the respondents for 7-9 years, and there are 3/30 or 10% of the respondents who have been working for 10 or more years in the company.

Table 4. The Distribution of the respondents according to their Tenure in the Company

Tenure in the Company	No. of Respondents	Percentage
0-3 years	12	40%
4-6 years	7	23%
7-9 years	8	27%
10 or more years in the company	3	10%
Total	30	100%

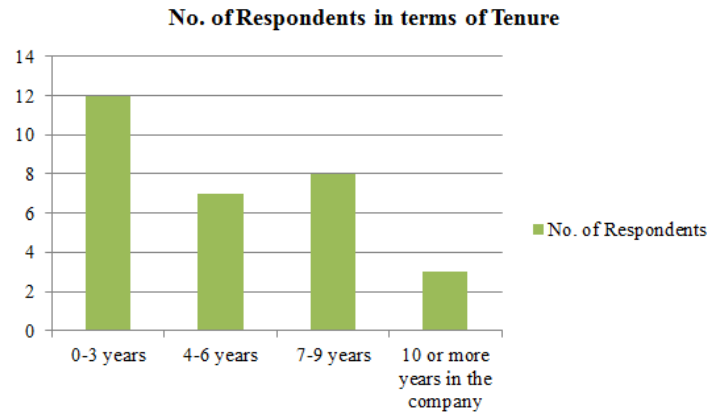


Fig 4. The Distribution of the respondents according to their Tenure in the Company

E. The Demographics of the respondents according to the Number of LSS Champions in the Company

Based on the data gathered as depicted in Table 4 and Figure 4 there are Lean Six Sigma Champions in the companies who advocate the deployment of process improvement and Kaizen Projects. There are 2/30 or 7% of the respondents who were White Belt certified, 7/30 or 23% of the respondents are Yellow Belt Certified, 10/30 or 33% of the respondents are Green Belt Certified, 7/30 or 23% of the respondents are Black Belt Certified, 4/30 or 13% of the respondents who are Master Black Belts.

Table 5. The Distribution of the respondents according to the Number of LSS Champions in the Company

LSS Champions in the Company	No. of Respondents	Percentage
White Belt	2	7%
Yellow Belt	7	23%
Green Belt	10	33%
Black Belt	7	23%
Master Black	4	13%
Total	30	100%

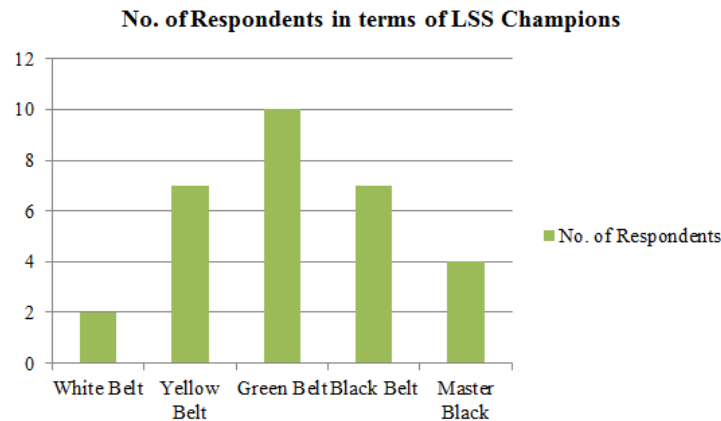


Fig 5. The Distribution of the respondents according to the Number of LSS Champions in the Company

F. The Demographics of the respondents according to the Location the Company

In terms of company location, the data gathered reveal that there are 9/30 or 30% of the respondents work in the company based in Pasig, 5/30 or 17% of the respondents are based in Mandaluyong, 12/30 or 40% of the respondents are based in Quezon City, and 4/30 or 13% of the respondents work in the companies based in Taguig City as reflected in Table 6 and Figure 6.

Pasig	9	30%
Mandaluyong	5	17%
Quezon City	12	40%
Taguig	4	13%
Total	30	100%

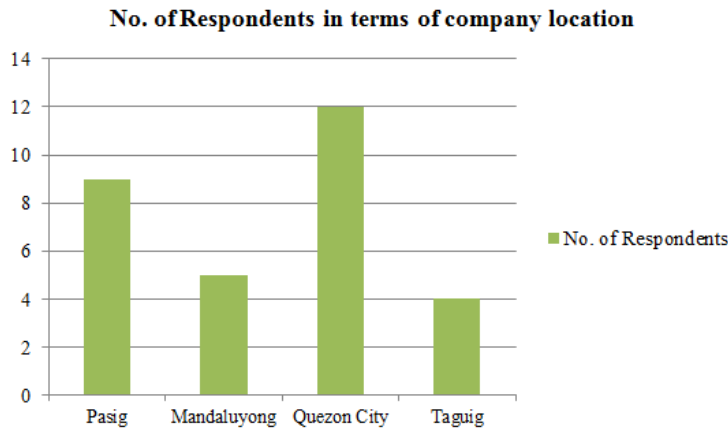


Table 6. The Distribution of the respondents according to the Location the Company

Location of Company	No. of Respondents	Percentage
---------------------	--------------------	------------

Fig 6. The Distribution of the respondents according to the Location the Company

G. The effects of implementing projects using Lean Six Sigma methodologies to the Company in the Operational Efficiency

In this subsection, the respondents were asked to elicit how LSS methodologies in effect help them to the extent of their operational and financial efficiencies using the Likert items (5-Very Efficient, 4- Highly Efficient, 3- Efficient, 2- Slightly Efficient, and 1- Not Efficient at all).

Based on the data gathered, the respondents of the study have seen the effects of implementing projects using Lean Six Sigma methodologies to be Very Efficient, and Highly- Efficient in all areas of Operations Management as described in Table 7 and Figure 7. Further, it can be noted that all respondents have regarded LSS methodologies to help them to become Very Efficient in the Process and Capacity Design, and Human Resources and Job Design.

Table 7. The effects of implementing projects using LSS methodologies in terms of Operational Efficiency

Operational Areas	5	4	3	2	1
Design of Goods and Services	25	5	0	0	0
Quality Management	28	2	0	0	0
Process and Capacity Design	30	0	0	0	0
Location Strategy	23	4	3	0	0
Layout Design and Strategy	27	3	0	0	0
Human Resources and Job Design	30	0	0	0	0
Supply Chain Management	29	1	0	0	0
Inventory Management	29	1	0	0	0

Legend: (5- Very Efficient, 4- Highly Efficient, 3- Efficient, 2- Slightly Efficient, and 1- Not Efficient at all)

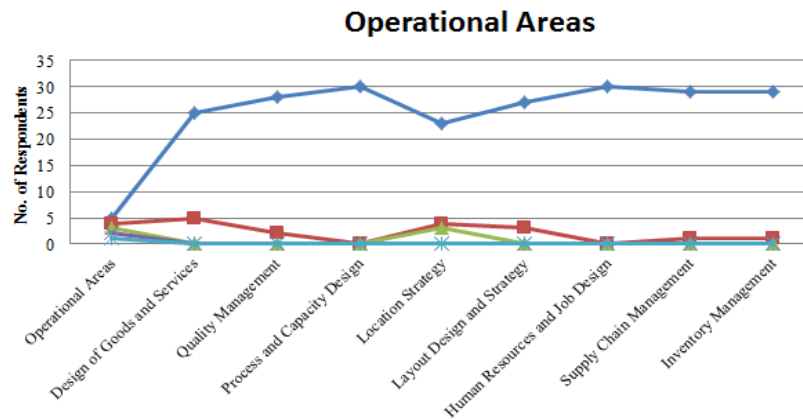


Fig 7. The Graph of the effects of implementing projects using LSS methodologies in terms of Operational Efficiency

H. The effects of implementing projects using Lean Six Sigma methodologies to the Company in the Financial Efficiency

Based on the data presented in Table 8 and Figure 8, all respondents regarded LSS methodologies to help them become Very Efficient in the areas of Selecting the Sources of Funds, Financial Analysis and Interpretation, Cost-Volume-Profit Analysis, Capital Budgeting, Working Capital Management, Profit Planning and Control. Also, the respondents regarded the use of LSS to make them “Very Efficient” in “Determining Financial Needs” and “Dividend Policy” areas with 97% and 94%, respectively.

Table 8. The effects of implementing projects using LSS methodologies in terms of Financial Efficiency

Financial Management Areas	5	4	3	2	1
Determining Financial Needs	29	1	0	0	0
Selecting the Sources of Funds	30	0	0	0	0
Financial Analysis and Interpretation	30	0	0	0	0
Cost-Volume-Profit Analysis	30	0	0	0	0
Capital Budgeting	29	0	0	0	0
Working Capital Management	30	0	0	0	0
Profit Planning and Control	30	0	0	0	0
Dividend Policy	28	2	0	0	0

Legend: (5- Very Efficient, 4- Highly Efficient, 3- Efficient, 2- Slightly Efficient, and 1- Not Efficient at all)

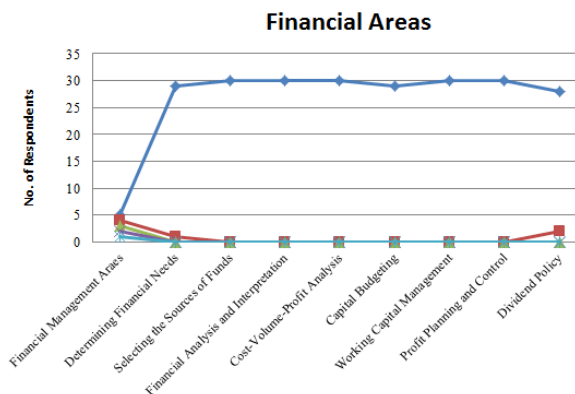


Fig 8. The Graph of the effects of implementing projects using LSS methodologies in terms Financial Efficiency

V. Conclusion and Recommendation

The study aimed at looking into the effects of implementing projects using Lean Six Sigma methodologies to the operational and financial efficiencies in various companies in the Philippines. On the basis of the results of the study, it can be gleaned that implementing business innovations, Kaizen Projects using Lean Six Sigma gauge and compliments the company to become Very Efficient and Highly-Efficient in almost all areas of Operation and Financial Management. Further studies could be done to investigate the overall impact of using LSS as scaffolding, process reengineering, waste eliminations in business. Researchers recommend an analysis of Lean IT in those companies scoped in this study to improve service quality.

References

- [1]. Van Der Aalst, W. M. (2002, June). Making work flow: On the application of petri nets to business process management. In International conference on application and theory of Petri nets (pp. 1-22). Springer, Berlin, Heidelberg.
- [2]. Dasig Jr, D. D. (2014). A study on the sectors of economy serviced by pre-industry system developers among companies in Metro Manila: A tool for business reengineering. arXiv preprint arXiv:1409.7277.
- [3]. Albliwi, S., Antony, J., Abdul Halim Lim, S., & van der Wiele, T. (2014). Critical failure factors of Lean Six Sigma: a systematic literature review. *International Journal of Quality & Reliability Management*, 31(9), 1012-1030.
- [4]. Andersson, R., Eriksson, H., & Torstensson, H. (2006). Similarities and differences between TQM, six sigma and lean. *The TQM magazine*, 18(3), 282-296.
- [5]. Pepper, M. P., & Spedding, T. A. (2010). The evolution of lean Six Sigma. *International Journal of Quality & Reliability Management*, 27(2), 138-155.
- [6]. Dasig Jr, D. (2017). A frontier in organizational and business process innovation in service management through lean six sigma Kaizen project implementation. *JABS*, 3(6), 263-283.
- [7]. Daniel Jr, D. D. (2017). An Evaluative Study on Project Management Tools for Managing Engineering Projects. *Ascendens Asia Journal of Multidisciplinary Research Abstracts*, 1(1).
- [8]. Jeston, J. (2014). *Business process management*. Routledge.
- [9]. Smith, H., & Fingar, P. (2003). *Business process management: the third wave* (Vol. 1). Tampa, FL: Meghan-Kiffer Press.
- [10]. Andersson, R., Eriksson, H., & Torstensson, H. (2006). Similarities and differences between TQM, six sigma and lean. *The TQM magazine*, 18(3), 282-296.
- [11]. Pepper, M. P., & Spedding, T. A. (2010). The evolution of lean Six Sigma. *International Journal of Quality & Reliability Management*, 27(2), 138-155.
- [12]. Thomas, A., Barton, R., & Chuke-Okafor, C. (2008). Applying lean six sigma in a small engineering company—a model for change. *Journal of Manufacturing Technology Management*, 20(1), 113-129.
- [13]. Albliwi, S. A., Antony, J., & Lim, S. A. H. (2015). A systematic review of Lean Six Sigma for the manufacturing industry. *Business Process Management Journal*, 21(3), 665-691.
- [14]. De Koning, H., Does, R. J., & Bisgaard, S. (2008). Lean Six Sigma in financial services. *International Journal of Six Sigma and Competitive Advantage*, 4(1), 1-17.
- [15]. Dasig Jr, D. D., Gatpandan, M. P., Valderama, A. M. C., Tadyo, M. A. B., Trballo, R. C., Gatpandan, P., & Dasig, D. D. (2015). Management of Knowledge Containers and Learning Strategies in the Context of Case-Based Reasoning. *Proceedings Journal of Education, Psychology and Social Science Research*.
- [16]. Dasig Jr, D. D., & Gatpandan, M. P. (2013, October). Change management of transitioned Information System (IS) to Management Information System (MIS) of the course system analysis and design 1 & 2 of Jose Rizal university: A basis for a comprehensive policies redirection. In *CIMQUSEF2013: 10ème session du congrès international sur la qualité de l'éducation et de la formation*.
- [17]. DASIG JR, D. D., BENOSA, M. C., PAHAYAHAY, A. B., ASEJO, N. R., TADEO, C., ELLAINE, M., & SABADO, D. C. Globalization of Technology Capability in these Technological Constellations. *International Journal of Business and Economic Affairs*, 106-115.
- [18]. Andersson, R., Eriksson, H., & Torstensson, H. (2006). Similarities and differences between TQM, six sigma and lean. *The TQM magazine*, 18(3), 282-296.
- [19]. Tjahjono, B., Ball, P., Vitanov, V. I., Scorzafave, C., Nogueira, J., Calleja, J., ...& Srivastava, S. (2010). Six Sigma: a literature review. *International Journal of Lean Six Sigma*, 1(3), 216-233.
- [20]. Antony, J., Rodgers, B., & Gijo, E. V. (2016). Can Lean Six Sigma make UK public sector organisations more efficient and effective?. *International Journal of Productivity and Performance Management*, 65(7), 995-1002.
- [21]. Shaun Aghili, C. M. A., & CIA, C. (2009). A Six Sigma approach to internal audits. *Strategic Finance*, 90(8), 38.
- [22]. Algasse, F., Yang, Q., & Au, J. (2014). Application of Lean Six Sigma principles to food distribution SMEs. *American Academic & Scholarly Research Journal*, 6(4), 251.
- [23]. Christopher, M., Payne, A., & Ballantyne, D. (1991). Relationship marketing: bringing quality customer service and marketing together.
- [24]. Caruana, A. (2002). Service loyalty: The effects of service quality and the mediating role of customer satisfaction. *European journal of marketing*, 36(7/8), 811-828.
- [25]. Gronroos, C. (1988). Service quality: The six criteria of good perceived service. *Review of business*, 9(3), 10.
- [26]. Jain, S. K., & Gupta, G. (2004). Measuring service quality: SERVQUAL vs. SERVPERF scales. *Vikalpa*, 29(2), 25-38.
- [27]. Gale, B., Gale, B. T., & Wood, R. C. (1994). *Managing customer value: Creating quality and service that customers can see*. Simon and Schuster.
- [28]. Bloemer, J., De Ruyter, K. O., & Wetzels, M. (1999). Linking perceived service quality and service loyalty: a multi-dimensional perspective. *European journal of marketing*, 33(11/12), 1082-1106.
- [29]. DASIG JR, D. D., TADEO, C., SABADO, D., CERVANTES, M. E., MANSUETO, M., PAHAYAHAY, A. B., ...& TRABALLO, R. Application of Participatory Research Model in the College Research and Development Program.
- [30]. GATPANDAN, P. H., ROSAS, M. F., & DASIG JR, D. A. N. I. E. L. Microsoft office specialist and microsoft technology associate certification: An integrated curriculum for technical skills validation.
- [31]. Daniel Jr, D. D. (2017). An Evaluative Study on Project Management Tools for Managing Engineering Projects. *Ascendens Asia Journal of Multidisciplinary Research Abstracts*, 1(1).
- [32]. Daniel Jr, D. D., Sabado, D. C., & Trballo, R. C. (2017, November). Measuring the Performance and Productivity of select Business Process Outsourcing Organizations: An Implementation of Data Envelopment Analysis (DEA) and Clustering Analysis. In *Ascendens Asia Journal of Multidisciplinary Research Conference Proceedings* (Vol. 1, No. 1).
- [33]. Dasig Jr, D. (2014, February). User Experience of Embedded System Students on Arduino and Field Programmable Gate Array (FPGA). In *Proc. of the Second Intl. Conf. on Advances in Applied Science and Environmental Engineering-ASEE* (pp. 124-128).
- [34]. De Ruyter, K., Wetzels, M., & Bloemer, J. (1998). On the relationship between perceived service quality, service loyalty and switching costs. *International journal of service industry management*, 9(5), 436-453.

Bernard G. Sanidad. "The Effects of Lean Six Sigma Projects in the Companies Operational and Financial Efficiencies". *IOSR Journal of Business and Management (IOSR-JBM)*, Vol. 21, No. 6, 2019, pp. -82-88