Comparative Analysis of Engineering Management of Public and Private Housing Projects in San Fernando, Pampanga

JOSEPH RAY GARCIA[1], NOEL FLORENCONDIA[2], ERBERT ALISON BENEDICTO[3]
[1]*Oriental Consultants Global – Technical Division, Philippines*
[2,3]*Master of Engineering Management Program, Graduate School, Nueva Ecija University of Science and Technology, Philippines*

Abstract- ***This study entitled "Comparative Analysis of Engineering Management of Public and Private Housing Projects in San Fernando, Pampanga" aims to identify and analyze the differences in engineering management practices between public and private housing projects in San Fernando, Pampanga, which shall lead to further understand the factors influencing project performance and identifying best practices for improving project delivery in both sectors. This study provides valuable insights for policymakers, project managers, and stakeholders to improve the efficiency, quality, and overall performance of future housing projects. Additionally, this research helps to identify the best practices and lessons learned from both public and private sector projects, which can be applied to other similar projects in the region. A quantitative research design was employed for this study to systematically collect and analyze numerical data. This approach is well-suited for identifying patterns, trends, and relationships between variables related to engineering management practices in public and private housing projects in San Fernando, Pampanga. This study specifically aims to differentiate the Public and Private sectors in terms of demography of engineering managers, planning and execution considerations, and opportunities and challenges faced by managers in both sectors. This study has presented an in-depth analysis on the differences of engineering management in Private and Public housing projects in San Fernando, Pampanga, therefore, it can provide an outline for engineering managers who are considering to enter the selected industry which can be used for a self-assessment prior to initiating their objectives and see where their skill sets, principles, and career goals can be more valuable, whether in Private or in Public sector. With this, it can be safe to say that this research will be beneficial for the industry by helping the right people to be at the right management career path in which they will be able to maximize their skills, relatively benefiting the society and the country.***

Indexed Terms- ***Comparative Analysis, Engineering Management, Public and Private Housing Projects***

I. INTRODUCTION

An essential part of a country's social and economic development is the construction sector, especially the housing sector. Public and private housing developments are vital for meeting the Philippines' increasing need for housing and raising the standard of housing for its people.

The National Housing Authority (NHA), a government agency, is mandated to provide decent and affordable housing for low-income families and homeless citizens. It is responsible for the development and implementation of national housing programs and policies. The Pag-IBIG Fund, a government-owned savings and loan association, primarily caters to Filipino workers. It offers housing loans to its members, allowing them to acquire affordable housing. It also provides financing for housing projects developed by private developers.

The Social Housing Finance Corporation (SHFC), a government financial institution, focuses on providing financial assistance to low-income households or the poorest of the poor. It offers a variety of housing finance programs with the lowest interest rate of 6%, including home loans, land acquisition loans, and housing project development loans.

However, some private developers such as Camella Homes, Bria Homes, and Lumina Homes are mainly responsible for the development of private housing. These developers cater to a wider range of income groups, offering a variety of housing options, from socialized to economic.

This study entitled "Comparative Analysis of Engineering Management of Public and Private Housing Projects in San Fernando, Pampanga" aims to identify and analyze the differences in engineering management practices between public and private housing projects in San Fernando, Pampanga, which shall lead to further understand the factors influencing project performance and identifying best practices for improving project delivery in both sectors.

By successfully outlining the comparison between the Public and Private sectors, the researcher aims to provide an in-depth analysis which can be valuable to the sectors pertained to in this study, to the engineering managers who are involved in the selected industry, and to the future professionals who intend to be in the housing project management field.

Conceptual Framework

This study will investigate the engineering management practices employed in public and private housing projects in San Fernando, Pampanga. It will examine how organizational factors, such as bureaucratic procedures, political influence, and market dynamics, influence project management processes. Specifically, the study will focus on project planning, execution, and closure stages, including activities like scope definition, resource allocation, quality control, and risk management. The primary outcome variables will be project performance metrics, such as time, cost, quality, and client satisfaction. The research will also explore the moderate effects of external factors, such as government regulations, economic conditions, technological advancements, and cultural factors. By understanding the interplay between these variables, the study aims to identify the best practices and potential areas for improvement in engineering management of public and private housing projects in the region.

General Problem

The general problem of this study is to identify and analyze the differences in engineering management practices between public and private housing projects in San Fernando, Pampanga, with the aim of understanding the factors influencing project performance and identifying best practices for improving project delivery in both sectors.

Specific Problems

This study entitled "Comparative Analysis of Engineering Management of Public and Private Housing Projects in San Fernando, Pampanga" aims to provide answer to the following specific problems:

1. How may the respondents be described in terms of the following:

1.1 Age

1.2 Sex

1.3 Sector

2. How do public and private housing projects differ in terms of:

2.1 Organization and management

2.2 Planning and execution

2.3 Quality, cost, and time performance

3. What are the key challenges and opportunities faced by project managers in both sectors?

Scope and Delimitation

This study aims to conduct a comparative analysis of engineering management of public and private housing projects in San Fernando, Pampanga. The study will be conducted among the employees within SHFC (Social Housing Finance Corporation) and Bria Homes San Fernando.

The data gathering for this study will be limited to geographic locations particularly the SHFC Region 3 Office and Bria Homes in San Fernando, Pampanga, and the set time frame is between October to December 2024 (Q4 2024).

To ensure the study remains focused and manageable, we will define the scope and delimitation. This will allow us to adequately address the research questions within the given constraints.

Significance of the Study

The findings of this research will contribute to a deeper understanding of the comparative analysis of engineering management practices in public and private housing projects in San Fernando, Pampanga. By identifying the strengths, weaknesses, opportunities, and threats (SWOT) analysis of each project type, this study will provide valuable insights for policymakers, project managers, and stakeholders

to improve the efficiency, quality, and overall performance of future housing projects. Additionally, this research will help to identify the best practices and lessons learned from both public and private sector projects, which can be applied to other similar projects in the region.

Definition of Terms

1. Economic Housing: Economic housing costs between 450,000-1.7 million PHP and targets lower-income households.
2. Socialized Housing: Socialized housing refers to government-provided housing for underprivileged citizens that costs 450,000 PHP or less.
3. Engineering Management: The application of engineering principles and techniques to the management of projects, systems, or organizations.
4. Public Housing: Housing provided by the government or a public agency, often rent-controlled and subsidized.
5. Private Housing: Housing owned and operated by private individuals or corporations, typically sold or rented on the open market.
6. Risk Matrix: A tool used to assess the potential risks associated with a project or activity, considering both the likelihood and impact of each risk.
7. SWOT Analysis: A strategic planning technique used to identify an organization's Strengths, Weaknesses, Opportunities, and Threats.
8. Policymakers: Individuals or groups responsible for creating and implementing public policies, such as government officials, legislators, and regulators.
9. Stakeholders: Individuals or groups who have an interest in or are affected by a particular project, organization, or policy.
10. Traditional/Waterfall: A traditional project management approach that follows a linear, sequential process. It involves distinct phases like planning, design, development, testing, and deployment. Each phase is completed before moving on to the next, with minimal flexibility or iteration.
11. Agile: An iterative approach to project management that emphasizes flexibility, collaboration, and continuous improvement. It involves breaking down projects into smaller, manageable tasks called sprints. Teams work in short cycles, delivering working software frequently, and adapting to changing requirements.
12. Hybrid: A combination of traditional and agile methodologies. It leverages the strengths of both approaches to balance structure and flexibility. Hybrid models can vary widely, but they often involve a traditional planning phase followed by iterative development cycles.
13. Functional Structure: A hierarchical organizational structure where employees are grouped based on their specific functions or roles within the organization, such as finance, marketing, or engineering.
14. Divisional Structure: An organizational structure where employees are grouped based on product lines, geographic regions, or customer segments. Each division operates as a semi-autonomous unit with its own functional departments.
15. Matrix Structure: A hybrid organizational structure that combines elements of functional and divisional structures. Employees report to both a functional manager and a project manager, allowing for cross-functional collaboration and flexibility.

II. METHODS AND PROCEDURE

Research Design

A quantitative research design was employed for this study to systematically collect and analyze numerical data. This approach is well-suited for identifying patterns, trends, and relationships between variables related to engineering management practices in public and private housing projects in San Fernando, Pampanga.

Specifically, the research design incorporates the following:

1. Descriptive Analysis:

➢ To provide a detailed overview of the characteristics of public and private housing projects.

➢ To quantify key variables such as project duration, budget, and quality metrics.

2. Correlational Analysis:

➢ To examine the relationships between variables like project management practices, resource utilization, and project outcomes.

➢ To identify potential correlations between factors influencing project performance.

Sampling Technique

A stratified random sampling technique was employed to ensure representation from various

departments and levels within the organization. The stratification was based on departments and project areas, such as Technical Working Group, Management Group, Procurement Team, and Site Operations Group. A random sample of 60 employees were selected from all the strata.

Research Instrument

A standardized questionnaire was employed as the primary research instrument. The questionnaire comprised five primary parts:

Part 1: Demographic Information

This part of the survey collected demographic data from respondents, such as age, gender, and industry sector.

Age:

☐ 18-25
☐ 26-35
☐ 36-45
☐ 46-55
☐ 55+

Sex:

☐ Male
☐ Female

Sector to which the current housing project is under:

☐ Public
☐ Private

Part 2: Planning and Execution Differences

This part of the study examined the differences in planning and implementation methodologies employed by public and private organizations.

A. How are project schedules and budgets monitored and controlled?

☐ Regular progress reports
☐ Critical Path Method
☐ Both regular progress reports and critical path method
☐ Other (please specify)

B. How are project risks identified and assessed?

☐ Brainstorming
☐ SWOT analysis
☐ Risk matrix
☐ Other (please specify)

C. What opportunities exist for improving project performance?

☐ Adopting new technologies
☐ Improving project management processes
☐ Enhancing stakeholder collaboration
☐ Other (please specify)

D. What factors influence project timelines and delays?

☐ Inadequate planning
☐ Resource constraints
☐ External factors
☐ Other (please specify)

E. What is the primary guiding principle of the management in terms of project accomplishment?

☐ Results-based
☐ Outcomes-based

Part 3: Key challenges and opportunities faced by the project managers in both sectors.

Using a Likert-scale, state your opinion on the following statements by answering from 1 (Strongly Disagree) to 5 (Strongly Agree).

A. The sector to which my project belongs faces challenges like limited resources and complex regulations.
B. The sector to which my project belongs offers opportunities for career growth and leadership development.
C. The sector to which my project belongs has positive social impact goals.

Data Gathering Procedure

The selected sample of employees were invited to participate in the survey by scanning a QR code which directed them to a Google Form. Respondents were encouraged to complete the questionnaire truthfully by November 8, 2024.

Data Analysis Technique

The collected data was analyzed using statistical techniques. The following statistical procedures were employed:

- Descriptive Statistics: To summarize the demographic information and the responses to the questionnaire items.
- Correlation Analysis: To examine the relationship between various project management practices and project outcomes.

Ethical Considerations

Ethical principles were followed throughout the research process.

1. Voluntary Participation: Ensure that participation in the study is voluntary and free from coercion.
2. Informed Consent: Obtain informed consent from all participants, clearly explaining the purpose of the study, potential risks and benefits, and their right to withdraw at any time.
3. Confidentiality and Privacy: Assure participants that their personal information will be kept confidential and used solely for research purposes.
4. Data Security: Implement measures to protect the security and confidentiality of collected data.

III. RESULTS AND DISCUSSION

The total number of employees comprising the selected population for this study was 60. Using the sample size calculator available online, a total of 53 respondents were needed in order to come up with a confidence level of 95% in which the real value is within ±5% of the surveyed value.

Part 1: Demographic Information

Among the 53 respondents, 20 or 37.7% belong to the age bracket of 26-35 years old making it the highest frequency in terms of age; 19 or 35.8% are 36-45 years old; 7 or 13.2% are 45-55 years old; 6 or 11.3% are 18-25 years old and 1 or 2% belong to 55+ year-old bracket.

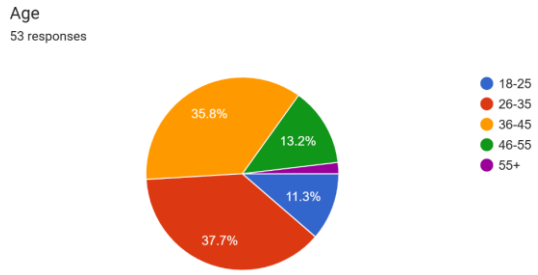

Figure 0-1 Demographic Information in Terms of Age

Majority of the respondent demographics in terms of sex was male which comprises 34 or 64.2%

of the sample size, while 19 or 35.8% were female.

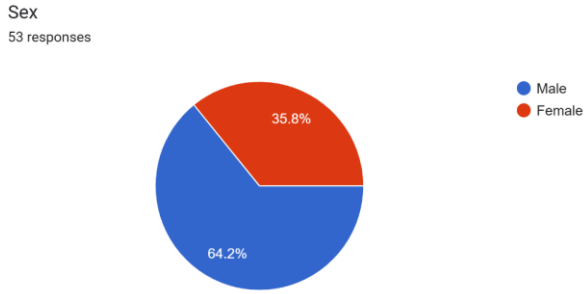

Figure 0 2 Demographic Information in Terms of Sex

Among the 53 respondents, 23 or 56.6% were from the Public Sector, and 30 or 43.4% were from Private Sector.

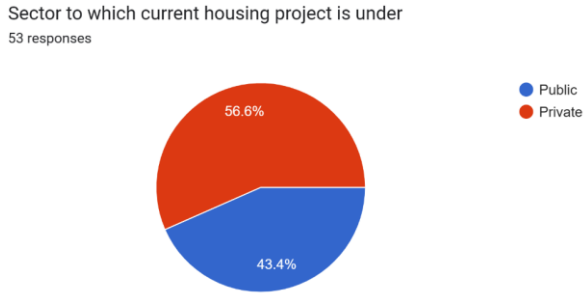

Figure 0-3 Demographic Information in Terms of Sector to which the current housing project is under

Part 2: Planning and Execution Differences

13 out of 30 or 43.3% among the respondents within Private Sector answered regular progress reports and 13 out of 18 or 72.2% also responded regular progress reports; 5 out of 30 or 16.7% among the respondents within Private Sector answered critical path method and 5 out of 13 or 38.5% also responded critical path method; 12 out of 30 or 40.0% among the respondents within Private Sector answered both regular progress reports and critical path method as their means of monitoring for project schedules and controlling budgets and 12 out of 22 or 54.5% also responded both regular progress reports and critical path method as their means of monitoring for project schedules and controlling budgets.

5 out of 23 or 21.7% among the respondents within Public Sector answered regular progress reports and 5 out of 18 or 27.8% also responded regular progress reports; 8 out of 23 or 34.8% among the respondents within Public Sector answered critical path method and 8 out of 13 or 61.5% also responded critical path method; 10 out of 23 or 43.5% among the

respondents within Public Sector answered both regular progress reports and critical path method as their means of monitoring for project schedules and controlling budgets and 10 out of 22 or 45.5% also responded both regular progress reports and critical path method as their means of monitoring for project schedules and controlling budgets.

			How are project schedules and budgets monitored and controlled?				Total
			Regular progress reports	Critical path method	Both regular progress reports and critical path method	Others	
Sector	1	Count	13	5	12	0	30
		% within Sector	43.3%	16.7%	40.0%	0.0%	100.0%
		% within How are project schedules and budgets monitored and controlled?	72.2%	38.5%	54.5%	0.0%	56.6%
	2	Count	5	8	10.0	-	23
		% within Sector	21.7%	34.8%	43.5%	0.0%	100.0%
		% within How are project schedules and budgets monitored and controlled?	27.8%	61.5%	45.5%	0.0%	43.4%
Total		Count	18	13	22	0	53
		% within Sector	34.0%	24.5%	41.5%	0.0%	100.0%
		% within How are project schedules and budgets monitored and controlled?	100.0%	100.0%	100.0%	0.0%	100.0%

Figure 0-4 Sector x How are project schedules and budgets monitored and controlled?

17 out of 30 or 56.7% among the respondents within Private Sector answered Brainstorming and 17 out of 25 or 68.0% also responded Brainstorming; 6 out of 30 or 20.0% among the respondents within Private Sector answered SWOT analysis and 6 out of 15 or 38.5% also responded SWOT analysis; 7 out of 30 or 23.3% among the respondents within Private Sector answered Risk Matrix as their means of project risks identification and assessment and 7 out of 13 or 53.8% also responded Risk Matrix as their means of project risks identification and assessment.

8 out of 23 or 21.7% among the respondents within Public Sector answered Brainstorming and 8 out of 25 or 32.0% also responded Brainstorming; 9 out of 23 or 34.8% among the respondents within Public Sector answered SWOT analysis and 9 out of 15 or 60.0% also responded SWOT analysis; 6 out of 23 or 43.5% among the respondents within Public Sector answered Risk Matrix as their means of project risks identification and assessment and 6 out of 13 or 46.2% also responded Risk Matrix as their means of project risks identification and assessment.

			How are project risks identified and assessed?				Total
			Brainstorming	SWOT analysis	Risk Matrix	Others	
Sector	1	Count	17	6	7	0	30
		% within Sector	56.7%	20.0%	23.3%	0.0%	100.0%
		% within How are project risks identified and assessed?	68.0%	40.0%	53.8%	0.0%	56.6%
	2	Count	8	9	6	-	23
		% within Sector	34.8%	39.1%	26.1%	0.0%	100.0%
		% within How are project risks identified and assessed?	32.0%	60.0%	46.2%	0.0%	43.4%
Total		Count	25	15	13	0	53
		% within Sector	47.2%	28.3%	24.5%	0.0%	100.0%
		% within How are project risks identified and assessed?	100.0%	100.0%	100.0%	0.0%	100.0%

Figure 0-5 Sector * How are project risks identified and assessed?

5 out of 30 or 16.7% among the respondents within Private Sector answered adopting new technologies and 5 out of 11 or 45.5% also responded adopting new technologies; 19 out of 30 or 63.3% among the respondents within Private Sector answered improving project management processes and 19 out of 26 or 73.1% also responded improving project management processes; 6 out of 30 or 20.0% among the respondents within Private Sector answered enhancing stakeholder collaboration and 6 out of 16 or 37.5% also responded enhancing stakeholder collaboration.

6 out of 23 or 21.7% among the respondents within Public Sector answered adopting new technologies and 6 out of 11 or 54.5% also responded adopting new technologies; 7 out of 23 or 34.8% among the respondents within Public Sector answered improving project management processes and 7 out of 26 or 26.9% also responded improving project management processes; 10 out of 23 or 43.5% among the respondents within Public Sector answered enhancing stakeholder collaboration and 10 out of 16 or 62.5% also responded enhancing stakeholder collaboration.

			What opportunities exist for improving project performance?				Total
			Adopting new technologies	Improving project management processes	Enhancing stakeholder collaboration	Others	
Sector	1	Count	5	19	6	0	30
		% within Sector	16.7%	63.3%	20.0%	0.0%	100.0%
		% within What opportunities exist for improving project performance?	45.5%	73.1%	37.5%	0.0%	56.6%
	2	Count	6	7	10	-	23
		% within Sector	26.1%	30.4%	43.5%	0.0%	100.0%
		% within What opportunities exist for improving project performance?	54.5%	26.9%	62.5%	0.0%	43.4%
Total		Count	11	26	16	0	53
		% within Sector	20.8%	49.1%	30.2%	0.0%	100.0%
		% within What opportunities exist for improving project performance?	100.0%	100.0%	100.0%	0.0%	100.0%

Figure 0-6 Sector * What opportunities exist for improving project performance?

7 out of 30 or 23.3% among the respondents within Private Sector answered inadequate planning and 7 out of 11 or 63.6% also responded inadequate planning; 9 out of 30 or 30.0% among the respondents within Private Sector answered resource constraints and 9 out of 18 or 50.0% also responded resource constraints; 14 out of 30 or 46.7% among the respondents within Private Sector answered enhancing stakeholder collaboration and 14 out of 23 or 60.9% also responded enhancing stakeholder collaboration.

4 out of 23 or 17.4% among the respondents within Public Sector answered inadequate planning and 4 out of 11 or 36.4% also responded inadequate planning; 9 out of 23 or 39.1% among the respondents within Public Sector answered resource constraints and 9 out of 18 or 50.0% also responded resource constraints; 9 out of 23 or 39.1% among the respondents within Public Sector answered external factors and 9 out of 23 or 39.1% also responded external factors; 1 out of 23 or 4.3% among the respondents within Public Sector answered others.

			What factors typically influence project timelines and delays?				Total
			Inadequate Planning	Resource Constraints	External Factors	Others	
Sector	1	Count	7	9	14		30
		% within Sector	23.3%	30.0%	46.7%	0.0%	100.0%
		% within What factors typically influence project timelines and delays?	63.6%	50.0%	60.9%	0.0%	56.6%
	2	Count	4	9	9	1	23
		% within Sector	17.4%	39.1%	39.1%	4.3%	100.0%
		% within What factors typically influence project timelines and delays?	36.4%	50.0%	39.1%	100.0%	43.4%
Total		Count	11	18	23	1	53
		% within Sector	20.8%	34.0%	43.4%	1.9%	100.0%
		% within What factors typically influence project timelines and delays?	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 0-7 Sector * What factors typically influence project timelines and delays?

13 out of 30 or 43.3% among the respondents within Private Sector answered outcomes-based and 13 out of 26 or 50.0% also responded outcomes-based; 17 out of 30 or 56.7% among the respondents within Private Sector answered results-based and 17 out of 27 or 63.0% also responded results-based.

13 out of 23 or 56.5% among the respondents within Public Sector answered outcomes-based and 13 out of 26 or 50.0% also responded outcomes-based; 10 out of 23 or 43.5% among the respondents within Public Sector answered results-based and 10 out of 27 or 37.0% also responded results-based.

			What is the primary guiding principle of the management in terms of project accomplishment?		Total
			Outcomes-based	Results-based	
Sector	1	Count	13	17	30
		% within Sector	43.3%	56.7%	100.0%
		% within What is the primary guiding principle of the management in terms of project accomplishment?	50.0%	63.0%	56.6%
	2	Count	13	10	23
		% within Sector	56.5%	43.5%	100.0%
		% within What is the primary guiding principle of the management in terms of project accomplishment?	50.0%	37.0%	43.4%
Total		Count	26	27	53
		% within Sector	49.1%	50.9%	100.0%
		% within What is the primary guiding principle of the management in terms of project accomplishment?	100.0%	100.0%	100.0%

Figure 0-8 Sector * What is the primary guiding principle of the management in terms of project accomplishment?

Part 3: Key Challenges and Opportunities Faced by Project Managers in Both Sectors

Majority of the respondents from the Private sector with 16 out of 30 or 53.3% agree that the sector faces challenges like limited resources and complex regulations; 7 or 23.3% strongly agree; 6 or 20.0% are neutral; and 1 or 3.3% disagree. Meanwhile, the majority also from Public sector translating to 17 out of 23 or 73.9% agrees to the same statement; 4 or 17.4% strongly agree; and 2 or 8.7% answered neutrally. When all 53 respondents from both sectors are combined, the majority of 33 out of 53 or 62.3% agree; 11 or 20.8% strongly agree; 8 or 15.1% are neutral; and 1 or 1.9% disagree.

Sector * The sector to which my project belongs to faces challenges like limited resources and complex regulations.

			The sector to which my project belongs to faces challenges like limited resources and complex regulations.					Total
			1	2	3	4	5	
Sector	1	Count	0	1	6	16	7	30
		% within Sector	0.0%	3.3%	20.0%	53.3%	23.3%	100.0%
		% within The sector to which my project belongs to faces challenges like limited resources and complex regulations.	0.0%	100.0%	75.0%	48.5%	63.6%	56.6%
	2	Count			2	17	4	23
		% within Sector	0.0%	0.0%	8.7%	73.9%	17.4%	100.0%
		% within The sector to which my project belongs to faces challenges like limited resources and complex regulations.	0.0%	0.0%	25.0%	51.5%	36.4%	43.4%
Total		Count	0	1	8	33	11	53
		% within Sector	0.0%	1.9%	15.1%	62.3%	20.8%	100.0%
		% within The sector to which my project belongs to faces challenges like limited resources and complex regulations.	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 0-9 Sector * The sector to which the project belongs faces challenges like limited resources and complex regulations

Half of the respondents from the Private sector, with 15 out of 30 or 50.0% strongly agrees that the sector offers opportunities for career growth and leadership development; 13 or 43.3% agree; both neutral and disagree gained 1 or 3.3% of the responses. Meanwhile, majority from Public sector translating to 16 out of 23 or 69.6% strongly agrees to the same statement; 4 or 17.4% agree; 2 or 8.7% answered neutrally; and 2 or 3.8% disagree. When all 53 respondents from both sectors are combined, the majority of 31 out of 53 or 58.5% strongly agrees; 17 or 32.1% agree; 3 or 5.7% are neutral; and 2 or 3.8% disagrees.

Sector * The sector to which my project belongs to offer opportunities for career growth and leadership development.

			The sector to which my project belongs to faces challenges like limited					Total
			1	2	3	4	5	
Sector	1	Count		1	1	13	15	30
		% within Sector	0.0%	3.3%	3.3%	43.3%	50.0%	100.0%
		% within The sector to which my project belongs to offer opportunities for career growth and leadership development.	0.0%	50.0%	33.3%	76.5%	48.4%	56.6%
	2	Count		1	2	4	16	23
		% within Sector	0.0%	4.3%	8.7%	17.4%	69.6%	100.0%
		% within The sector to which my project belongs to offer opportunities for career growth and leadership development.	0.0%	50.0%	66.7%	23.5%	51.6%	43.4%
Total		Count	0	2	3	17	31	53
		% within Sector	0.0%	3.8%	5.7%	32.1%	58.5%	100.0%
		% within The sector to which my project belongs to offer opportunities for career growth and leadership development.	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 0-10 Sector * The sector to which the project belongs to offer opportunities for career growth and leadership development

When asked whether their sector has a positive social impact, it can be noticed that the responses are diverse. 11 of 30 or 36.7% from Private sector strongly agree; 9 or 30.0% each are recorded for both agree and neutral; and 1 or 3.3% disagrees. Meanwhile, nearly half from Public sector translating to 11 out of 23 or 47.8% strongly agrees to the same statement; 8 or 34.8% agree; 13 or 24.5% answered neutrally; and 1 or 1.9% noticeably disagrees. When all 53 respondents from both sectors are combined, 22 out of 53 or 41.5% strongly agree; 17 or 32.1% agree; 13 or 24.5% are neutral; and 1 or 1.9% disagree.

Sector * The sector to which my project belong to has positive social impact goals.

			The sector to which my project belong to has positive social impact goals.					Total
			1	2	3	4	5	
Sector	1	Count		1	9	9	11	30
		% within Sector	0.0%	3.3%	30.0%	30.0%	36.7%	100.0%
		% within The sector to which my project belong to has positive social impact goals.	0.0%	100.0%	69.2%	52.9%	50.0%	56.6%
	2	Count			4	8	11	23
		% within Sector	0.0%	0.0%	17.4%	34.8%	47.8%	100.0%
		% within The sector to which my project belong to has positive social impact goals.	0.0%	0.0%	30.8%	47.1%	50.0%	43.4%
Total		Count	0	1	13	17	22	53
		% within Sector	0.0%	1.9%	24.5%	32.1%	41.5%	100.0%
		% within The sector to which my project belong to has positive social impact goals.	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 0-11 Sector x The sector to which the project belong has positive social impact goals

Summary of Findings

Based on the data gathered, the researcher had come out with the following findings:

1. The research involved a total of 53 respondents, predominantly composed of young and middle-aged individuals. The largest demographic group comprised individuals aged 26-35 years old, accounting for 37.7% of the total sample. This was followed by the 36-45 age group, representing 35.8% of the respondents. A smaller proportion of respondents belonged to the 45-55 age group (13.2%), while 11.3% were between 18-25 years old. The oldest age group, 55 and above, constituted a mere 2% of the sample.

   In terms of gender, the study revealed a male-dominated sample, with 64.2% of the respondents identifying as male. Females, on the other hand, comprised 35.8% of the total sample. The study further examined the sectoral distribution of respondents. A significant proportion of respondents (56.6%) were employed in the public sector, while the remaining 43.4% were affiliated with the private sector.

   These demographic insights provide valuable context for understanding the perspectives and experiences of the study participants. The predominance of younger individuals in the sample suggests a focus on emerging trends and contemporary issues. The gender disparity may indicate potential biases or limitations in the study, and future research could benefit from a more balanced gender representation.

2. The result of this study has illustrated the differences in management techniques and principles between engineering projects in the private and in the public sector. Among those differences are that the private sector typically use regular progress reports while public sector use both regular progress report and critical path method in project scheduling and budget control; the Private sector apply brainstorming for risk identification and assessment while Public sector usually do SWOT analysis; opportunities for engineering managers in Private sector mostly are about improving project management process while for those in Public are mostly in enhancing stakeholder collaboration; in Private sector, external factors are what mostly influence project timelines and delays, while both resource constraints and external factor apply in Public sector; the primary guiding principle in Private sector is results-based, while outcomes-based is for Public sector.

3. Both public and private sectors agree that they are faced with challenges like limited resources and complex regulations. The variance of their respective means which is 0.12 indicates that the situations in both sectors are more or less the same in terms of such factor. Moreover, it can be noticed that the two sectors pose different degrees of opportunities for career growth and leadership development as the Private tend to agree with this statement while Public sector respondents strongly agree. However, the variance of 0.12 suggests an observable difference but not that significant. Finally, both sectors have expressed self-perceived assertion that they have positive social impact goals as both groups of the respondents generally agree with the statement.

CONCLUSION

It is a well-known fact that the engineering industry, whether private or public sectors are both significant in nation-building and are in fact expected to collaborate with each other in order to serve the purpose of transcending the society to the level of progress and development that this day and age demands. While both sectors share this common goal as proven in the results of this study which established that Public and Private engineering managers lead their organizations to create positive social impacts, they still face different challenges and opportunities in carrying out their duties and responsibilities. These differences define their respective strengths and weaknesses which explains why despite having a common goal, they manage their organizations in different ways.

In all factors of planning and execution, significant differences were recorded as to how project managers in the private and public sector deal with their management responsibilities. The private sector typically use regular progress reports while public sector use both regular progress report and critical path method in project scheduling and budget control; the Private sector apply brainstorming for risk identification and assessment while Public sector usually do SWOT analysis; opportunities for engineering managers in Private sector mostly are about improving project management process while for those in Public are mostly in enhancing stakeholder collaboration; in Private sector, external factors are what mostly influence project timelines and delays, while both resource constraints and external factor apply in Public sector; and finally, the

primary guiding principle in Private sector is results-based, while outcomes-based is for Public sector.

This study has presented an in-depth analysis on the differences of engineering management in Private and Public housing projects in San Fernando, Pampanga, therefore, it can provide an outline for engineering managers who are considering to enter the selected industry which can be used for a self-assessment prior to initiating their objectives and see where their skill sets, principles, and career goals can be more valuable, whether in Private or in Public sector. With this, it can be safe to say that this research will be beneficial for the industry by helping the right people to be at the right management career path in which they will be able to maximize their skills, relatively benefiting the society and the country.

RECOMMENDATIONS

This study has focused to investigate and make a comparative analysis of the engineering management of Private and Public sector housing projects in San Fernando, Pampanga wherein several illustrations were presented on how exactly they become distinct from one another. Based on these findings, the following recommendations are proposed:

1. Both sectors can streamline the process flow which will simplify the operations leading to a more efficient and smoother project and program execution. An effort to confront the current system may be challenging but it can be beneficial especially if the workforce itself has assessed that the existing complex processes and policies are a hindrance for them in carrying out their respective duties in the best way. By doing this, not only will the employees and managers benefit in easing their activities, but the organization itself will improve by boosting the productivity of its existing resources.

2. A program in which project managers will be trained how to handle challenges in the project in which external factors are the primary contributing element can be made as this study has proven that this is what influence project timelines and delays the most for both public and private sector.

3. Engineering managers who are considering to enter the selected industry in this study can use the findings presented herein to help in their decision-making process in selecting the more appropriate sector they should be in where they can maximize their skills and be in the more suitable path for professional development.

REFERENCES

[1] Ingram, K., & Nitsenko, V. (2021). Comparative Analysis of Public Management Models.

[2] Ogedengbe, F. (2024). A Comparative Analysis of Project Management Practices in Government and Private Organizations in Nigeria.