UNIVERSITY OF SANTO TOMAS
Institute of Information and Computing Sciences
Department of Information Systems

Machine Learning-Enhanced Site Selection Optimization for Strategic Location Analysis of Harvard Multiland Homes Real Estate Corporation Construction Projects

A Capstone Project

presented to the

Department of Information Systems

Institute of Information and Computing Sciences

University of Santo Tomas

in partial fulfillment

of the requirements for the degree of

Bachelor of Science in Information Systems

Chua, Kyle Steven T.

Concepcion, Margareth Samantha G.

Jacobo, Mikaella P.

Lazaro, Adrian DM.

Catubag, Joseph Richard G.

May 2025

TABLE OF CONTENTS

LIST OF FIGURES

Chapter 1

1.0. Introduction

Site selection is a crucial process for a real estate corporation to further commit on planning construction projects because many factors are necessary to be considered such as location and profitability. These can significantly help a company in identifying optimal and strategic ways of achieving further success in their builds. Overlooking these aspects could potentially redirect a company's projects further away from their goals to success.

A real estate corporation's historical data, together with publicly available historical data on associated external factors to optimal site selection can enhance the location analysis of company executives for strategic decision-making. These data will undergo the different types of business analytics: Descriptive Analytics, Predictive Analytics, and Prescriptive Analytics through a machine learning model in accurately analyzing a site location with respect to strongly associated data affecting optimality.

1.1.1. Company Background

Harvard Multiland Homes Real Estate Corporation is a developing company duly organized and existing under the Philippine Law. It is registered with the Securities and Exchange Commission with the primary purpose of ''to own, use, improve, develop, subdivide, sell, exchange, lease and hold for investment or otherwise, real estate of all kinds including building houses, apartments, and other Structures''. The company embodies highly efficient executives who dedicate effort so that the company can hand in hand pursue their vision of excellence in the field of developing homes, together we envisioned achieving our mission.

1.1.2. Company Description

Harvard Multiland Homes is a small to medium-sized low-cost housing developer specializing in designing, constructing, and selling affordable residential properties for low- to middle-income families in the Philippines. The company offers a range of housing options, from single-family homes to duplexes and townhouses, all built with quality materials and modern designs. Harvard Multiland Homes prioritizes sustainability by incorporating eco-friendliness into its projects.

1.1.3. Company Mission

To provide affordable, sustainable, and high–quality housing solutions that empower Filipino families to build better futures. Harvard Multiland Homes is committed to creating communities that foster growth, security, and a sense of belonging while promoting environmental responsibility and social development.

1.1.4. Company Vision

The company operates with a customer-centric approach, ensuring that its homes are not only affordable but also durable, functional, and tailored to the needs of Filipino families. With a team of skilled professionals and strategic partnerships with local government units and financial institutions, Harvard Multiland Homes is dedicated to making homeownership accessible and achievable for more Filipinos.

1.1.5. Company Objectives

Our company ensures affordability, sustainability, quality, community development, expansion, and customer satisfaction. Harvard Multiland Homes Real Estate Corporation envisions a future where every Filipino family has a place

to call home – a Harvard Multiland Homes that nurtures their dreams and aspirations.

Our esteemed client from Harvard Multiland Homes Real Estate Corporation, **Caroline Chuateco**, holds the distinguished positions of Vice President, Treasurer, and Marketing Head, playing a pivotal role in the strategic and financial management of the organization.

1.2. Project Context

This project is dedicated to utilizing business analytics to process and interpret essential statistical data, facilitating strategic-level decision-making and location analysis for optimal site selection. Recognizing the critical role of data-driven insights in optimizing location choices, the project team will develop an interactive heatmap dashboard equipped with systematic functions for advanced visualization and analysis with the use of a machine learning model. This map dashboard will integrate key datasets, including geographic, socioeconomic, population, project costs, housing value, human resource, and environmental factors, ensuring a comprehensive approach to site evaluation.

To ensure the reliability and accuracy of the data used in this project, information will be sourced through formal collaboration with Caroline Chuateco, Vice President, Treasurer, and Marketing Head of Harvard Multiland Homes Real Estate Corporation. Additionally, publicly available and validated datasets from the Philippine Statistics Authority's (PSA) OpenSTAT online platform, the Humanitarian Data Exchange (HDX), geoportal PH, and the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) will be incorporated to enrich the analysis.

1.3.0. Purpose and Objectives

With this project, the proponents have identified the general and specific objectives to ensure the development of a comprehensive tool for site selection in construction projects. These objectives are aimed for efficient decision-making processes, integrating historical and predictive data, and providing the company executives with actionable insights to support strategic planning and long-term business growth.

1.3.1. General Objective

By leveraging structured datasets and incorporating them into an interactive heatmap dashboard, the project aims to provide a practical and insightful tool that will assist stakeholders in evaluating multiple site options based on historical and predictive data. This initiative will not only enhance the efficiency of site selection for the client's construction projects but also contribute to data-driven decision-making that aligns with broader business objectives and long-term growth strategies.

1.3.2. Specific Objectives

Below are the following specific objectives of the project:

1. To provide at-a-glance views of optimally available locations for site selection through an interactive heatmap dashboard.
2. To develop an interactive heatmap dashboard that enables dynamic data visualization of key site selection factors.
3. To implement a machine learning model for:
    a. Assessing potential risks and development feasibility using predictive modeling techniques.
    b. Predicting the profitability and potential revenue of selected site locations.

4. To generate prescriptive reports that include the development of a Multi-Criteria Decision-Making (MCDM) model for the ranking of optimal locations in a region to support strategic decision-making in site selection.

1.4.0. Scope and Limitations

In developing this project, the proponents acknowledge the need for clear parameters to guide its implementation. The scope and limitations of the project shall establish specific boundaries for focusing on achieving the project's objectives.

1.4.1. Scope

This project is defined by specific areas and parameters to ensure a structured and data-driven approach to site suitability analysis.

To begin with, the interactive heatmap dashboard will use publicly available and company-provided data. The data analysis will focus on the following regions' geographic, socioeconomic, population, project costs, housing value, human resource, and environmental data: National Capital Region (NCR), Calabarzon, and Central Luzon. Furthermore, site suitability factors will be assessed based on a weighted scoring system using multiple criteria (geographic, socioeconomic, cost, environmental impact, etc.).

Additionally, the interactive heatmap dashboard will be designed for internal use by Harvard Multiland Homes Real Estate Corporation to support decision-making in construction site selection. To enhance usability and accessibility in location analysis, the map dashboard will be developed using web-

based tools (e.g., Geographic Information System (GIS) platforms, data visualization software, and relevant programming languages). Lastly, only key stakeholders ,such as company executives and planners, will have access to the interactive heatmap dashboard, ensuring that critical information will remain secure.

1.4.2. Limitations

The project is shaped by several key limitations that guide its scope and the conclusions drawn from its analysis.

First, the project shall be focused on most of the available data from 2023 and below. Necessary data beyond that threshold shall be forecasted through extrapolation. Next, the weather data will only be gathered through the Philippine Atmospheric Geophysical and Astronomical Services Administration's (PAGASA) website once this project proposal has been approved through the project proponents' first oral defense, since the administration requires the approved capstone/thesis document/s. Next, the project does not accommodate real-time data updates; instead, it relies solely on static datasets available through importing at the time of the research period. Furthermore, the analysis will be confined to quantitative data, excluding any qualitative factors. Elements such as the political climate or community sentiment, which could influence outcomes, will not be considered. This decision narrows the focus but ensures a consistent and measurable approach to the data. Cost estimations, will be based only on existing industry and company data. This means that projections will not account for potential shifts in market conditions or unforeseen economic factors that could arise in the future.

When it comes to risk analysis, the project will consider weather and climate data, such as flood-prone areas or earthquake fault lines, but only if such information is publicly available. If specific data sets are inaccessible or absent, they will not be incorporated into the analysis. The last important aspect is the project's focus on potential site locations. While the analysis will thoroughly assess these locations, it will not address the feasibility of land acquisition or any ownership constraints.

The accuracy of the insights drawn from the project will heavily depend on the quality and completeness of the data sources used. Incomplete or poor-quality data could limit the reliability of the analysis. Despite these limitations, the research aims to provide valuable insights within its defined boundary.

1.5.0. Conceptual Framework

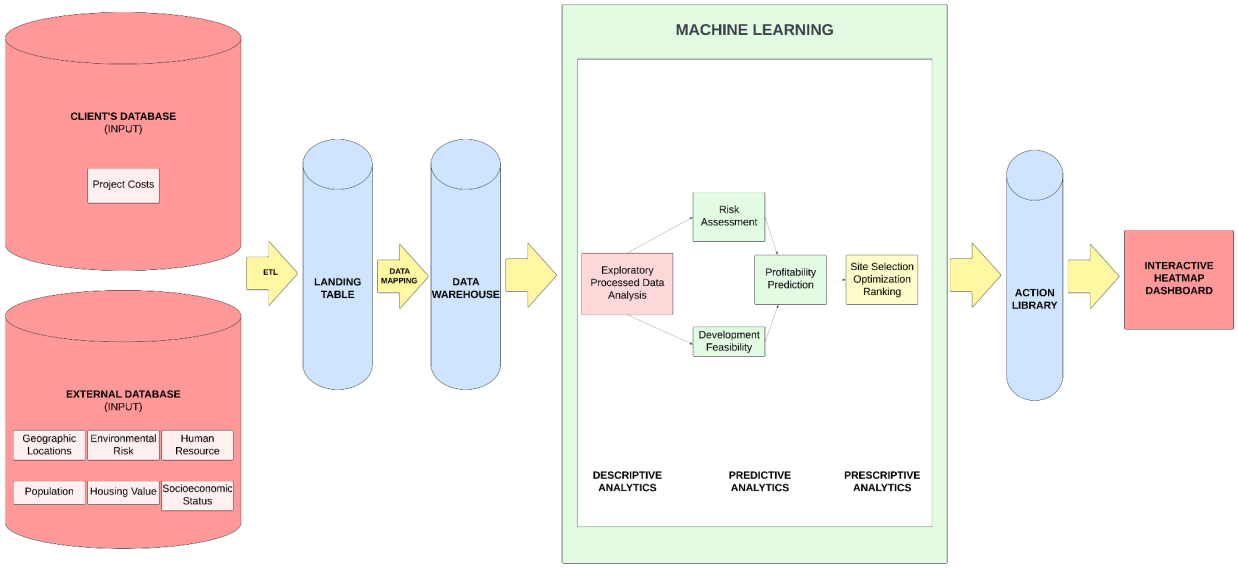


Figure 1.5.1. Conceptual Framework

a. Data Collection and Input (Client and External Database)

The project shall start with data collection, where information is sourced from the project client's database, which consists of their project costs, and external databases, which consist of publicly available online data on geographic locations, environmental risk, human resource, population, housing value, and socioeconomic status.

b. Data Extraction, Transformation, and Loading (ETL Process)

This collected data will undergo an Extract, Transform, and Load (ETL) process for data normalization to ensure unity and proper formatting. The processed data is then stored in a landing table that will serve as the foundation for succeeding steps.

c. Data Warehouse and Data Mapping

Once in the Landing Table, the data undergoes mapping and categorization, leading to the loading of mapped data prepared for analytics. This step structures the information into three key analytics layers: Descriptive, Predictive, and Prescriptive, in preparation for machine learning. This approach ensures that the system can derive valuable insights from the data, enabling better decision-making in the later stages.

d. Machine Learning

Machine learning drives our analytical site selection framework by systematically transforming raw data into strategic insights through three interconnected phases: descriptive, predictive, and prescriptive analytics.

First, descriptive analytics processes historical client data (e.g., project costs, timelines) and external datasets (e.g., economic indicators, environmental records) to uncover patterns—such as high-risk flood zones or regions with rising client demand—using clustering, geospatial mapping, and trend analysis. These insights inform predictive models, where techniques like random forests and regression correlate historical risks and profitability drivers with site-specific variables to forecast outcomes. Finally, prescriptive analytics prioritizes optimal locations through optimization algorithms that balance predicted risks, ROI, and business goals, generating ranked site recommendations tailored to stakeholder priorities.

By linking past trends, future projections, and actionable strategies, this end-to-end approach ensures data-driven decisions that align profitability, risk tolerance, and operational feasibility.

e. Action Library

All analyzed data and machine learning outputs are stored in the Action Library, making them easily accessible for decision-makers. This structured repository serves as the backend for the Interactive heatmap dashboard, ensuring that insights are well-organized and readily available for visualization.

f. Interactive Heatmap Dashboard Output

The final output is an interactive, GIS-powered heatmap dashboard, which enables users to visualize site suitability scores dynamically. This dashboard is able to pull necessary data from the action library which allows decision-makers to

filter locations based on key factors such as cost, population, and risk levels, while also providing a comparative view of site profitability and feasibility.

1.6.0. Project Milestones/Timeline

The Work Breakdown Structure is divided into five parts, each represented by a specific color. This color-coding system not only simplifies the Work Breakdown Structure but also aligns seamlessly with the Gantt chart, which visually represents the project timeline. The same colored milestones are indicative of specific project phases, providing clear and intuitive identification of progress throughout the project.

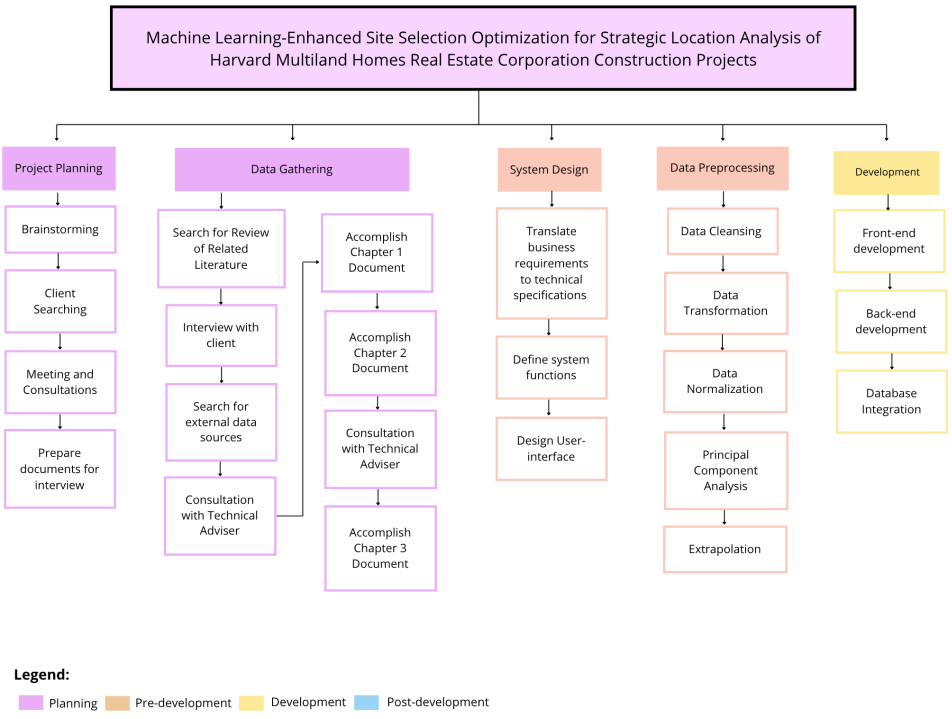


Figure 1.6.1. Work Breakdown Structure #1 (WBS)

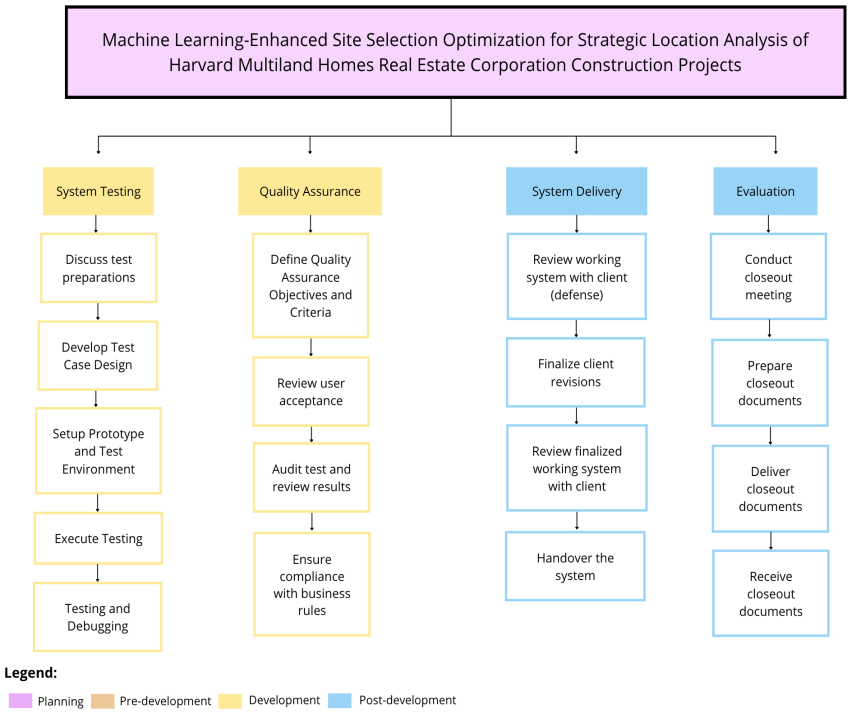


Figure 1.6.2. Work Breakdown Structure #2 (WBS)

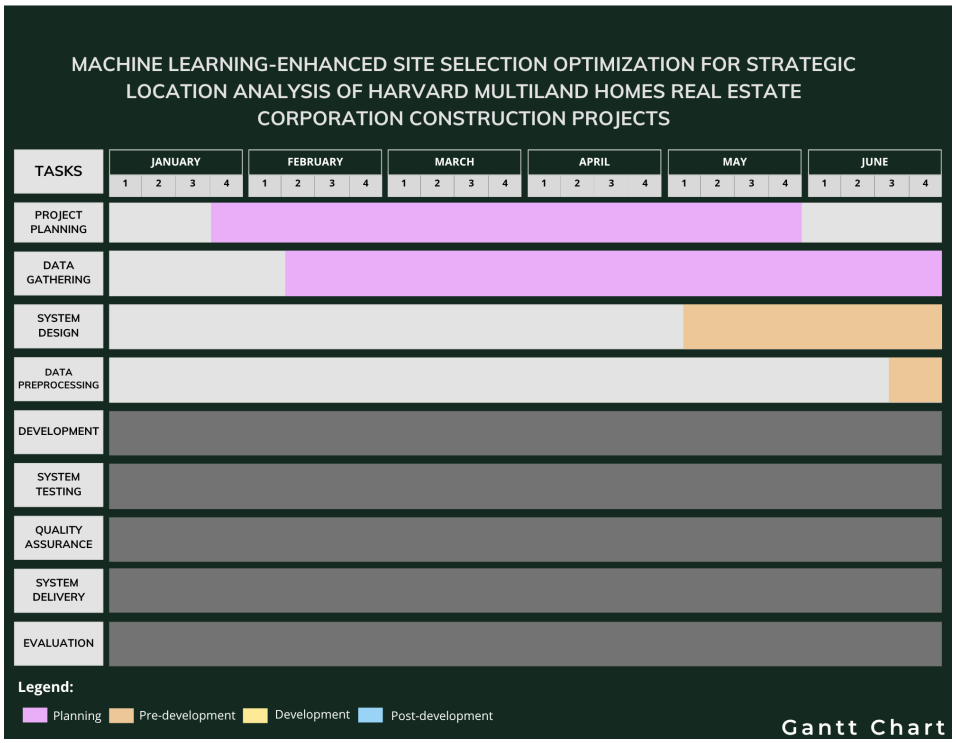


Figure 1.6.3. Gantt Chart #1 (timeline)

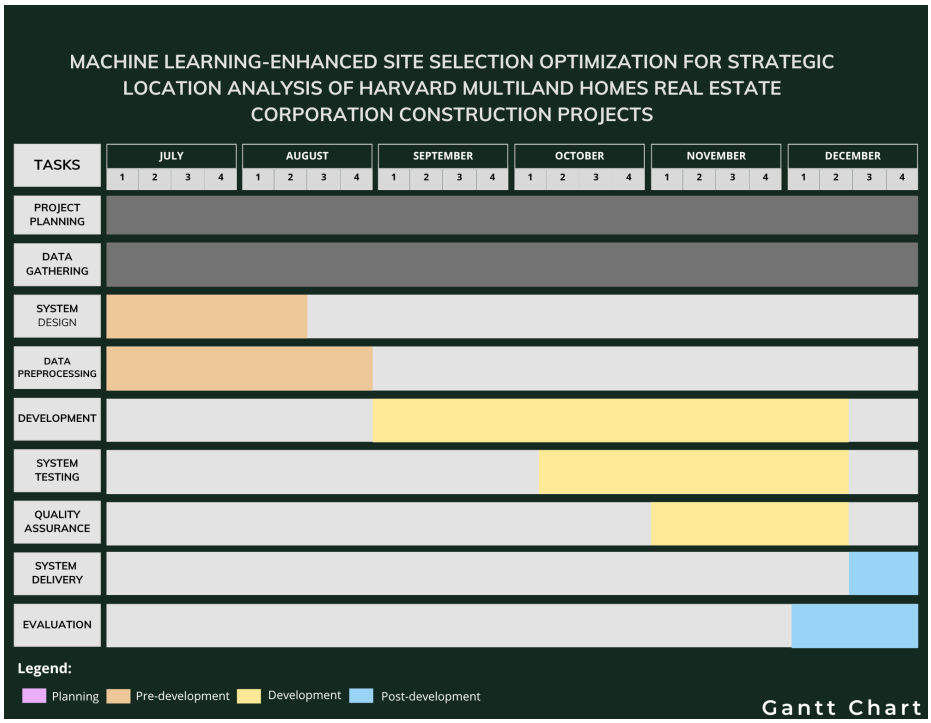


Figure 1.6.4. Gantt Chart #2 (timeline)

Appendices

Appendix A: THS1 Forms

THS1-Form1: Title Proposal Form

UNIVERSITY OF SANTO TOMAS
Institute of Information and Computing Sciences
Department of Information Systems
2nd Semester AY 2024-2025

CAPSTONE PROJECT PROPOSAL TITLE FORM

Name of the Proponents: Section: 3ISA Date: May 28, 2025
1. Chua, Kyle Steven, T.
2. Concepcion, Margareth Samantha, G.
3. Lazaro, Adrian DM.
4. Jacobo, Mikaella, P.

1.0. **Proposed Capstone Title:** Machine Learning-Enhanced Site Selection Optimization for Strategic Location Analysis of Harvard Multiland Homes Real Estate Corporation Construction Projects

2.0. **Area of Investigation:**

Site selection is a crucial process for a real estate corporation to further commit on planning construction projects because many factors are necessary to be considered such as location and profitability. These can significantly help a company in identifying optimal and strategic ways of achieving further success in their builds. Overlooking these aspects could potentially redirect a company's projects further away from their goals to success.

3.0. **Importance / Significance of the Study:**
4.0. This project is dedicated to utilizing business analytics to process and interpret essential statistical data, facilitating strategic-level decision-making and location analysis for optimal site selection.

5.0. **Target Beneficiaries:**

Harvard Multiland Homes Real Estate Corporation, a registered developing company with the Securities and Exchange Commission with the primary purpose of "to own, use, improve, develop, subdivide, sell, exchange, lease and hold for investment or otherwise, real estate of all kinds including building houses, apartments, and other Structures". Our esteemed client from Harvard Multiland Homes Real Estate Corporation, **Caroline Chuateco**, holds the distinguished positions of Vice President, Treasurer, and Marketing Head, playing a pivotal role in the strategic and financial management of the organization.

UST:A022-02-F011 REV02 2/16/16

6.0. **Related Studies, Literature, Systems, and Technologies**

6.0.1. Related Studies & Literature

The Role of Population in Economic Growth

This study by Peterson (2017) involves the correlation between the following attributes: population and economic growth (socioeconomy). It utilizes historical data in highlighting population growth's influence in expanding the labor force and stimulating economic activity from a global perspective. It also emphasizes that population growth's impact on an economy's performance is influenced by other factors such as technological advancement, capital accumulation, and policy frameworks.

The study's analysis between population growth and economic growth results that both have a situational correlational relationship, since its correlation's positivity or negativity can also depend on specific contextual factors, like a society's strategic investments in education, healthcare, and infrastructure in enhancing a growing population's benefits.

Flooding Risk and Housing Values: An Economic Assessment of Environmental Hazard

This research by Daniel, V., Florax, R. J., & Rietveld, P. (2007) involves the correlation between the following attributes: flooding risk (environmental risk) and housing value. It examines the impact of climate change, fluctuating river cycles, and evolving water resource management practices on the spatial distribution of flood risk. It highlights how these factors have altered flood patterns and how they influence property values in flood-prone areas. The study reveals that properties located within the 100-year floodplain experience a reduction in value, with prices being 0.3% to 0.8% lower than those of properties outside of flood risk zones.

risk in housing purchases

Song Shi and Michael Naylor (2023) examined how an earthquake impacts household perceptions of seismic risk and real estate prices, using data from the 2010/2011 Canterbury earthquake in New Zealand. Their findings revealed that households initially underestimated seismic risks and overreacted after the quake, underscoring the importance of quake-related information in real estate pricing and risk management.

This study is closely related to the project as both involve data analysis for strategic site selection in real estate. While the study emphasizes the impact of seismic risk perceptions on decision-making, the project similarly uses data to analyze various factors influencing site selection. Both approaches aim to improve decision-making by providing insights that help assess risks and identify optimal locations for development.

6.0.2. Related Systems and Technologies

Planning and layout of tourism and leisure facilities based on POI big data and machine learning

This technological research study by Wu, S., et al. (2025) focuses on investigating the spatial arrangements of tourism infrastructure Beijing, China (focusing on six core district's of the city's main urvan area) with a proposal for a more scientific and efficient strategy for site selection using a data-driven approach. It utilizes Point of Interest (POI) data and population grid data in analyzing facility distribution.

The study's methodology is immersed around a supervised machine learning technique called the CART (Classification and Regression Trees) decision tree algorithm in handling mixed data types and high-dimensional datasets effectively, training it to evaluate a grid's suitability for leisure facility development. This was done by analyzing the presence urban service facilities such as hotels, public transportation, shopping areas, etc. as independent variables. The results of this study provides a scalable framework for strategic site selection using machine learning.

A framework for GIS-based site selection and technical potential evaluation of PV solar farm using Fuzzy-Boolean logic and AHP multi-criteria decision-making approach

This technological research study by Noorollahi, Y., et al. (2022) devices methodologies for site selection and potential evaluation of PV solar farm in Khuzestan, Iran that include a utilization of a multi-criteria decision-making approach with categorized data such as the following: climatic data (e.g., solar irradiance, sunshine hours), economic data (e.g., distance to roads, substations, urban/rural areas), orographic data (e.g., slope, elevation), and environmental data (e.g., land use). The study also further integrates Analytical Hierarchy Process (AHP), Fuzzy Logic, Boolean Logic, and GIS spatial analysis in determining the most suitable locations for solar farm development. A suitability map was also produced through a Weighted Linear Combination (WLC) overlay method with filtering features to exclude restricted zones such as fault lines, protected areas, and gas pipelines.

The study's results and findings state that its applied showcase a reliable approach to spatial decision-making. Furthermore, the flexibility of the model allows it to be adapted for other regions and renewable energy technologies.

The Impact of Machine Learning on Prescriptive Analytics for Optimized Business Decision-Making

This technological research study by Ara, A., et al. (2024) explores how integrating Machine Learning (ML) with Prescriptive Analytics enhances business decision-making by improving accuracy, efficiency, and forecasting. It highlights case studies across various industries, showcasing the competitive advantages

of adopting ML-driven tools. The paper also addresses challenges like data management, system integration, and skill gaps, offering best practices to overcome these obstacles. Ultimately, it emphasizes the importance of ongoing innovation in ML and prescriptive analytics for businesses to remain competitive in a data-driven world.

The study's focus on competitive advantages from Machine Learning mirrors the researchers aim to provide Harvard Multiland Homes a strategic edge by providing data-driven insights that streamline the site selection process. Moreover, the paper's discussion on overcoming challenges like data management and system integration is highly relevant as we work with large geospatial datasets and integrate them into ML models for predictive analysis, ensuring the project's success in a data-driven real estate market.

7.0. **Bibliography**

Ara, A., Maraj, A.,Rahman, A., Bari, H. (2024). The Impact of Machine Learning on Prescriptive Analytics for Optimized Business Decision-Making. International Journal of Management Information Systems and Data Science 1(1): 7-18.
https://www.researchgate.net/publication/379893157_THE_IMPACT_OF_MACHINE_LEARNING_ON_PRESCRIPTIVE_ANALYTICS_FOR_OPTIMIZED_BUSINESS_DECISION-MAKING

Daniel, V., Florax, R. J., & Rietveld, P. (2007). FLOODING RISK AND HOUSING VALUES: AN ECONOMIC ASSESSMENT OF ENVIRONMENTAL HAZARD. AgEcon Search.
https://doi.org/10.22004/ag.econ.7333

Noorollahi, Y., Ghenaatpisheh Senani, A., Fadaei, A., Simaee, M., & Moltames, R. (2022). A framework for GIS-based site selection and technical potential evaluation of PV solar farm using Fuzzy-Boolean logic and AHP multi-criteria decision-making approach. Renewable Energy, 186, 89–104.
https://doi.org/10.1016/j.renene.2021.12.124

Peterson, W. F. (2017). The Role of Population in Economic Growth. SAGE Open, 7(4).
https://doi.org/10.1177/2158244017736094

Shi, S., & Naylor, M. (2023). risk in housing purchases. Journal of Housing and the Built Environment.
https://doi.org/10.1007/s10901-023-10012-6

Wu, S., Wang, J., Jia, Y., Yang, J., & Li, J. (2025). Planning and layout of tourism and leisure facilities based on POI big data and machine learning. PLoS ONE, 20(3), e0298056–e0298056.
https://doi.org/10.1371/journal.pone.0298056

UNIVERSITY OF SANTO TOMAS
Institute of Information and Computing Sciences
Department of Information Systems
2nd Semester AY 2024-2025

Reviewed by/date	Comments/Suggestions/Remarks (please use additional sheets if necessary):
Asst. Prof. William A. Cortez	
Asst. Prof. Imelda E. Marollano	
Asst. Prof. Khrisnamonte M. Balmeo	

Panel Member's Recommendations: Please check which of the following actions you recommend:
( ) 1. Accept this proposal without any significant modifications suggested.
(X) 2. Accept this proposal but proponents must follow th prescribed modifications.

_____
_____

( ) 3. Do not accept this proposal and discontinue any further efforts on it.

THS1-Form2: Thesis Group Advisorship Agreement Form

UNIVERSITY OF SANTO TOMAS
Institute of Information and Computing Sciences
Department of Information Systems

2nd Semester AY 2024- 2025

THESIS GROUP ADVISORSHIP AGREEMENT

This is in acceptance of the Technical Adviser/Co-author rights for the Capstone Project Proposal **Machine Learning-Enhanced Site Selection Optimization for Strategic Location Analysis of Harvard Multiland Homes Real Estate Corporation Construction Projects**

As Technical Adviser, the tasks include the following:

- providing logistics analysis for the project
- overseeing the project's development phase
- providing input and critic on project documentation in terms of technical content and descriptions
- presenting the project alongside the student proponents in front of a panel

As a Co-author, the faculty member is a member of the proponents and must be involved in the project from conceptualization until the project is completed. He/she must also perform the tasks to be performed by the Technical Adviser.

The name of the Technical Adviser/Co-author will be included in all documentation as a Technical Adviser or Co-author depending on the chosen obligation. As such, they are obligated to make sure that student proponents defend their projects within the designated timeline.

They are also obligated to oversee the transition from THS1 to THS2 of the student proponents. Upon agreeing to be Technical Adviser in THS1, they too, also agree to be the group's Technical Adviser in THS2.

Student proponents will still need to do the project development within their own terms. A Technical Advisor/Co-author need not be part of the development aspect (i.e. writing program codes, implementing test case procedures, etc.); however, a technical advisor/co-author must be aware of the project's development process flow (i.e. what is the expected output of the given code, why that type of test case procedure was done, etc.).

Conforme:
Proponents: **Signature**

1. *Lazaro, Adrian* _____
2. *Chua, Kyle Steven* _____
3. *Concepcion, Margareth Samantha* _____
4. *Jacobo, Mikaella* _____

Joseph Richard G. Catubag, MBA
Technical Adviser/Co-author
Date: 05/28/2025

Asst. Prof. Jannette E. Sideño
Capstone Project Course Facilitator
Date:

THS1-Form3A: Endorsement for Project Proposal

UNIVERSITY OF SANTO TOMAS
Institute of Information and Computing Sciences
Department of Information Systems

2nd Semester AY 2024-2025

ENDORSEMENT FOR CAPSTONE PROJECT PROPOSAL

Project Title: Machine Learning-Enhanced Site Selection Optimization for Strategic Location Analysis of Harvard Multiland Homes Construction Projects

Proponents:
1. Chua, Kyle Steven T.
2. Concepcion, Margareth Samantha G.
3. Jacobo, Mikaella P.
4. Lazaro, Adrian DM.

Technical Adviser: ***Inst. Joseph Richard G. Catubag***

In partial fulfillment of the requirements for the degree of Bachelor of Science in Information Systems, the Capstone Project mentioned above, has been adequately prepared and submitted by the proponents and is hereby endorsed by the undersigned for Title oral examinations.

Inst. Joseph Richard G. Catubag
Technical Adviser/Co-author
Date: 5/8/2025

Asst. Prof. Janette E. Sideño
Capstone Project Facilitator
Date: 5-9-25

THS1-Form4A: Panel Members' Availability Confirmation

UNIVERSITY OF SANTO TOMAS
Institute of Information and Computing Sciences
Department of Information Systems

2nd Semester AY 2024-2025

PANEL MEMBERS' AVAILABILITY CONFIRMATION

Thesis Title: Machine Learning-Enhanced Site Selection Optimization for Strategic Location Analysis of Harvard Multiland Homes Construction Projects

Proponents:
1. ***Chua, Kyle Steven T.***
2. ***Concepcion, Margareth Samantha G.***
3. ***Jacobo, Mikaella P.***
4. ***Lazaro, Adrian DM.***

Scheduled Defense Date : ***May 16, 2025***

Time : ***11:30 am to 01:00 pm***

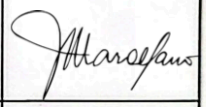
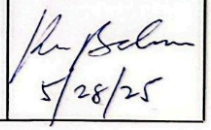
Room : ***1915***

Capstone Project Coordinator	Confirmation
Asst. Prof. Janette E. Sideño	5-8-2025

Panel Members	Confirmation
1. **Asst. Prof. William A. Cortez**	
2. Asst. Prof. Imelda E. Marollano	
3. Asst. Prof. Khrisnamonte M. Balmeo	

UNIVERSITY OF SANTO TOMAS
COLLEGE OF INFORMATION AND COMPUTING SCIENCES
Department of Information Systems

Consolidated Comments of Panel Members

Panel Member's Name (As indicated in the Schedule of Defense)	Suggestion during the Defense	Your Revision/Action Made	(Indicate the chapter and page)	Status (complied, not complied)	Signature of Panel Member with date
Asst. Prof. W. Cortez	State in your limitations how you will go about the missing data values beyond the years of available data you have gathered. Indicate that you will evaluate the effectiveness of the methods you will be using.	Proponents added a limitation indicating extrapolation to be implemented for missing necessary data. Proponents added a statement on evaluating and validating models performances before choosing what to use before project deployment.	Chapter 1: 1.4.2. Limitations Pg. 6 Chapter 3: 3.4.0. Business Analytics Model and Testing Pg. 69	complied	
Asst. Prof. I. Marollano	Indicate that you will evaluate the effectiveness of the methods you will be using.	Proponents added a statement on evaluating and validating models performances before choosing what to use before project deployment.	Chapter 3: 3.4.0. Business Analytics Model and Testing Pg. 69	compiled	
Asst. Prof.K. Balmeo	State in your limitations how you will go about the missing data values beyond the years of available data you have gathered.	Proponents added a limitation indicating extrapolation to be implemented for missing necessary data.	Chapter 1: 1.4.2. Limitations Pg. 6	complied	 5/28/25

UNIVERSITY OF SANTO TOMAS
COLLEGE OF INFORMATION AND COMPUTING SCIENCES
Department of Information Systems

Noted by:

Asst. Prof. Janette E. Sideño
Course Facilitator
Date: 5-28-25

Accepted by:

Asst. Prof. William A. Cortez
Panel Member 1

Asst. Prof. Imelda E. Marollano
Panel Member 2

Asst. Prof. Khrisnamonte M. Balmeo
Panel Member 3

2nd Floor, Blessed Pier Giorgio Frassati Building, UST España Boulevard,
Sampaloc, Manila Philippines 1015
Telephone No. 3406-1611 local 8518 - ricd@ust.edu.ph
http://www.ust.edu.ph Facebook : @USTIICS2014Official Twitter : @USTIICS2014