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Designing a Decision-Support System Architecture for Career Selection: A Case Study at the University of the Philippines

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Abstract

The decision-making process for career selection is a complex situation for students who are going through their transition from high school to higher education. In this paper, a decision-support system (DSS) architecture was designed to help address the aforementioned problem. Using the instrumental case study research method, the study investigated the decision-making process of incoming college students in their career selection and identified user requirements essential to the development of the decision-support system by following a four-phase Waterfall methodology for systems development. The study was anchored on social cognitive career theory (SCCT), which served as the basis for the inclusion of decision-making factors. The University of the Philippines (UP) was chosen as the case site for being the national state university of the country and having its own streamlined, process-centered admission system, the UPCAT. Factors derived from SCCT were further validated from interview responses of UPCAT 2024 applicants who recently underwent this decision-making process in their career selection. Responses from the interview were transcribed and imported into NVivo software for coding and theme segmentation. These themes were then organized into business, functional, nonfunctional, and system requirements. The requirements were transformed to requirements modeling through use case diagramming and data modeling through entity relationship diagramming. A user interface (UI) prototype of the career selection DSS, named UP College Admission Decision-making Tool (UP-CADET), was the final output designed using Figma. Finally, results from 23 potential users of the user acceptance test, using a 7-point Likert scale, indicated positive views for UP-CADET.

Keywords

career selection, decision support system, user interface prototype, system architecture, admission system development.

1. Introduction

Knowledge and power are closely linked, as knowledge shapes individuals and societies. Education is a key driver of empowerment, economic development, and innovation. Studies show that higher education improves income stability, job quality, and financial security, while also enhancing workforce productivity and contributing to national development (Daway-Ducanes et al. 2022; Oketch et al. 2014).

The K-12 program, implemented in 2013, extended basic education in the Philippines from 10 to 12 years to enhance the curriculum and better prepare students for higher education (Oracion et al. 2020). The inclusion of senior high school (SHS) has been shown to improve employability and produce globally competitive graduates (Malbas et al.

2023). SHS graduates may enter the workforce or pursue higher education, with university enrollment steadily increasing—1,321,773 students enrolled in state universities and colleges in 2019–2020 (CHED 2020)—reflecting growing demand and economic considerations in educational decisions (Arora and Padroo 2023).

Undoubtedly, choosing and deciding on professional aspirations is a crucial matter in a society where the overall quality of education is heavily linked to economic growth (Daway-Ducanes et al. 2022). Career goals and aspirations start with children being asked what they want to be when they grow up as early as in their formative years, which is a clear reflection of society's expectations for kids to be productive and value- adding adults in the future (Leach and Zepke 2005). This culture makes decision-making a challenging and intricate process especially for students who are on the course of transitioning from their secondary school to higher education (Nguyen and Taylor 2003, as cited in Leach and Zepke, 2005). Payne (2003) as cited in Leach and Zepke (2005) noted that factors such as socio-economic background and gender influence students' educational decisions. With numerous options available, students often struggle to choose degree programs and higher education institutions, which can significantly impact their future success, highlighting the need for careful consideration and research (Briones and Rubi 2021).

To ease students' decision-making, the Philippines institutionalized mass tertiary education through Republic Act 10931, the Universal Access to Quality Tertiary Education Act (UAQTEA) or Free Tuition Law, in 2017. This law exempts students in SUCs, LUCs, and state-run technical-vocational institutions from tuition fees, enabling underprivileged students to pursue higher education without financial burden. As a result, students may be more motivated to develop their knowledge, skills, and interests, potentially contributing to national development through innovation and international engagement. Evite (2015) noted that although institution-administered exams give SUCs autonomy over admissions, they limit equal access for underrepresented students. Variations in university prerequisites, separate requirement submissions, single-use tests, and limited awareness of other high-performing SUCs make college applications complex and restrict student choice. Currently, there is no centralized admission system in the Philippines, with each SUC maintaining its own policies (iEducation Philippines n.d.), making it difficult for students and parents to navigate and select suitable institutions and programs (Garanayak et al. 2018).

Admission to the University of the Philippines (UP) highlights the underrepresentation of students from disadvantaged backgrounds. The UP-College Admission Test (UPCAT) combines 60% of the UPCAT score with 40% of Grades 8–11 high school final grades, adjusted for minority representation and geographic origin (Catabijan 2022; Daway-Ducanes et al. 2022). Income and related factors, such as school type and performance, also influence admission probability and first-choice major placement (Daway-Ducanes et al. 2022). While the Free Tuition Law improves access to tertiary education, UP's highly selective policies favor students with resources to access private review centers, limiting equity (Bayudan-Dacuycuy et al. 2023). The lack of a centralized admission system further complicates decision-making for students and parents (Garanayak et al. 2018), emphasizing the need for SUCs to implement inclusive, well-structured admission policies (Daway-Ducanes et al. 2022).

Through review of existing related literature, it is found that there have been efforts to aid incoming college students by developing recommender systems (RS) in other countries. RS is a type of information retrieval system which suggests different products, services, and information based on the user's interest to help in their decision-making (Garanayak et al. 2018). These systems aim to address the difficulties faced by students when making decisions about which university to enroll in or what degree program aligns the most with their current academic standings and personal backgrounds. However, these currently available resources still hold restrictions in terms of contextualizing the nature of college admissions in the Philippines.

A decision-support system (DSS) is a computer-based information system designed to improve decision-making by incorporating users' preferences and constraints (Arnott 2004). Unlike traditional information systems, DSS emphasizes decision-making across all phases, while the final choice remains with the user (Ong 2014). Existing college admission systems often adopt a limited, university-centered perspective, leading to underrepresentation of certain demographics (Fong and Biuk-Aghai 2014) and inefficient decision-making for students. Implementing a DSS enables the experiences and preferences of incoming college students—the primary decision-makers—to be fully reflected, supporting more informed choices.

To address the problems, the study aimed to design an architecture for a decision-support system to assist incoming college students in selecting the most suitable degree program and campus offered by State Universities and Colleges

(SUCs) in the Philippines. Specifically, it sought to identify student-centered system requirements, develop the system through user interface prototyping, and evaluate the proposed interface using user approval testing.

2. Literature Review

This section reviews existing studies relevant to the development of decision support systems and analytical models in decision making for career selection. The review focuses on prior system architectures, decision-making techniques, and implementation approaches that address similar problem contexts. By synthesizing these studies, this section identifies prevailing trends, methodological strengths, and research gaps that inform the design and contribution of the present study.

Several studies have explored opportunities related to predicting the chances of students being admitted to colleges and universities (Sonawane 2017). In their study, Fong and Biuk-Aghai (2014) observe that some students, although eligible and suitable for admission, do not have access to information about other "best" universities which possibly limits their choices. Meanwhile, some applicants end up applying for multiple admissions, to increase their chances of getting into one, without assurance that they will be able to be admitted eventually (Sonawane 2017). Existing studies put efforts into addressing both concerns of how to obtain enough valuable information and what the right decision to make out of that information (Garanayak et al. 2018). Table 1 compares existing recommender systems made to aid in the decision-making processes of various end-users relevant to this study.

Previous studies have demonstrated the growing use of recommender systems and decision-support tools in guiding students' educational and admission-related decisions; however, most exhibit notable limitations. Ragab et al. (2012) developed a college recommender system that allocated students to suitable tracks but excluded those who failed preparatory courses, making the system non-inclusive. Fong and Biuk-Aghai (2014) proposed an automated recommender system to support university admission recommendations in Macau by evaluating multiple student variables, while Sonawane (2017) introduced a Student Admission Predictor to estimate admission chances and recommend universities, though it was limited to Indian international students and did not consider financial capacity. Similarly, Garanayak et al. (2018) focused on recommending top IIT colleges and branches in India based on entrance exam ranks, but the scope was restricted to selected institutes and programs. Kumari et al. (2019) enhanced this line of work by developing CAPSLG, which incorporated academic scores, preferences, and filters such as tuition fees and location to shortlist universities. Meanwhile, Esquivel and Esquivel (2021) presented a web-based DSS to predict senior high school graduates' admission likelihood, but its institution-centered design and omission of key student-related factors, such as location and financial aid, limited its applicability for individualized decision-making.

Existing admission decision-support systems often neglect key factors such as geographic location, financial aid availability, and institutional type, while focusing primarily on the perspective of administrators rather than students. This limits their effectiveness in supporting actual decision-making for incoming college students. The decentralized nature of Philippine university admissions further complicates the selection process. To address these gaps, this study proposes a centralized career selection DSS that integrates individual preferences, constraints, and contextual factors, providing a singular, student-centered platform. The system aims to support informed decisions for students, families, and other stakeholders, improving accessibility and efficiency in tertiary education selection.

Table 1. Relevant existing recommender systems

No.	Title	Proponent/s	Country	Main decision-maker	Decision-making Factors included
1	Design and Implementation of a Hybrid Recommender System for Predicting College Admission	Ragab et. al. (2012)	India	Students	Cumulative Grade Point Average (GPA), Gender, Nationality, College Capacity, Prerequisite Course Rates
2	An Automated University Admission Recommender System for Secondary School Students	Fong and Biuk-Aghai (2014)	China	Secondary schools	Secondary School Records, Gender, Age, Specialized Secondary Track

3	Student Admission Predictor	Sonawane (2017)	India	Students	Admission Probability, State, HEI Type, Rank, Acceptance Rate, Tuition Fees, Living Expenses, Enrollment Population
4	An Automated Recommender System for Educational Institute in India	Garanayak et. al. (2018)	India	Students, Guardians	College Rank, College Name, Degree Program
5	CAPSLG: College Admission Predictor and Smart List Generator	Kumari et. al. (2019)	India	Students	College, Degree Program, Admission Category, Admission Probability, Secondary Grade Record, Expenses, Location, Distance, Transportation, Duration
6	A Machine Learning-Based DSS in Predicting Undergraduate Freshmen Enrolment in a Philippine University	Esquivel and Esquivel (2021)	Philippines	University	City, Province, Religion, College Admitted To, Status of Enrollment, Gender, Application Type, Previous School Type

Building on the identified gaps in existing DSS, the proposed career selection system is grounded in Social Cognitive Career Theory (SCCT) by Lent, Brown, and Hackett, derived from Bandura's General Social Cognitive Theory. SCCT provides a structured framework for modeling educational and occupational decision-making by integrating individual attributes, environmental factors, and behavioral mechanisms, conceptualizing career development as the interaction of interest formation, choice behavior, and performance outcomes (Briones and Rubi 2021; Wang et al. 2022). Career interests and decisions are shaped by contextual affordances—background factors that influence self-efficacy and interest development, and proximal influences that constrain or facilitate choice—supporting the formulation of decision criteria and constraints in the system. Guided by SCCT, empirical factors such as personal background, learning experiences, expectations, and external constraints were operationalized as inputs for the DSS. The system adopts a Waterfall model framework enabling a linear, sequential approach from requirements analysis to system design and validation. Key variables—including academic performance, family influence, financial capacity, geographic location, and personal preferences—inform a logical decision model, which is transformed into a user-validated system architecture with defined benchmarks and functional features, supporting informed, multi-criteria decision-making for UP campus and degree program selection. See Figure 1 for the conceptual framework of the study.

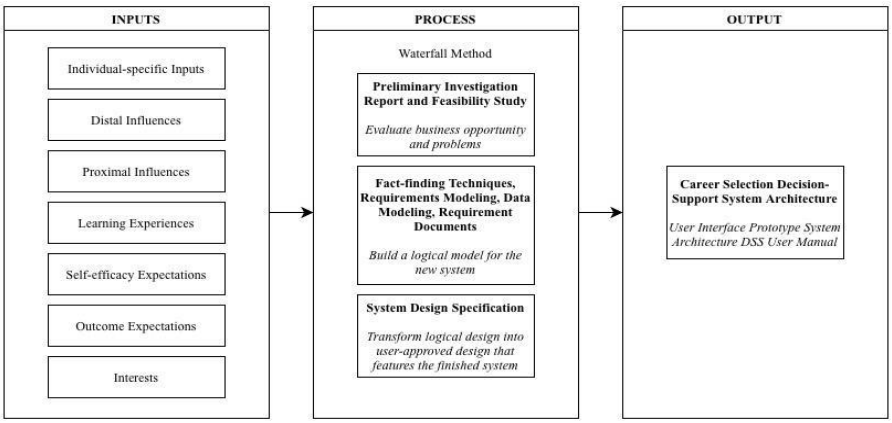


Figure 1. Conceptual framework of the study

3. Methods

This study employed an Instrumental Case Study approach, a recognized strategy in information systems research, to examine the decision-making process of incoming college students regarding their educational and career choices. Multiple data collection methods—literature review, in-depth interviews, and survey questionnaires—were used to identify student decisions, influencing factors, and system requirements. The mixed-methods approach facilitated a deeper understanding of socio-technological phenomena (Shaanika 2022) and allowed the study to explore the complexities of student decision-making, informing the design of a more effective career selection DSS.

For the procedure, the Waterfall methodology is a traditional systems development technique that established a firm foundation of requirements definition and analysis before conducting any design for all other software development life cycle (SDLC) models (Ruparelia 2010; Shelly and Rosenblatt 2012; Adenowo and Adenowo 2013). Like a blueprint for building construction, it is based on an overall plan making it a predictive approach to developing new systems. It requires that a certain stage in the model is completed first before proceeding to the next stage, thereby not allowing any opportunities to revisit the previous stages or encourage iterations to incorporate improvements in the system.

Since this study is only concerned with developing a user-interface design prototype as the final deliverable, the original five-phase model was adapted and modified into four-phase from systems development lifecycle model of Shelly and Rosenblatt (2012) which involves system planning, system analysis, system design, and system validation, all are described in Table 2 and illustrated in Figure 2.

Table 2. Four-phase waterfall methodology

Phase	Description
System Planning	The purpose of this phase was to describe problems or desired changes in existing information systems or business processes.
System Analysis	The purpose of this phase was to build a logical model of the proposed decision-support system.
System Design	The purpose of this phase was to create a blueprint for the proposed decision-support system that will satisfy all documented requirements.
System Validation	The purpose of this phase was to collect potential users' approval and validation on the inclusion of business requirements based on the designed user interface of the proposed decision-support system through a set of questions.

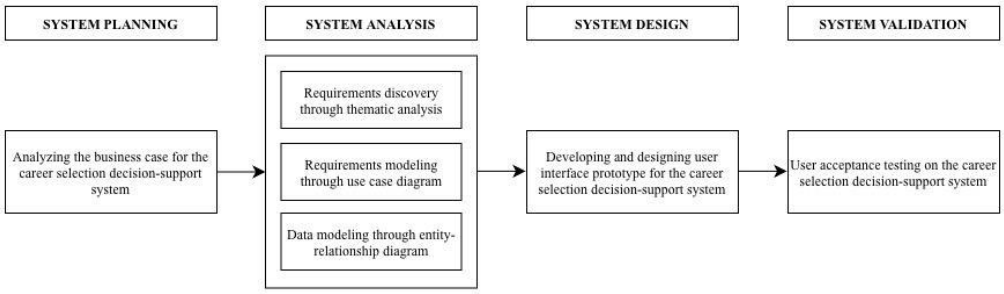


Figure 2. Systems development methodological framework

For the requirements discovery, fact-finding techniques, also called information gathering, employed through requirement discovery are used in the early stages of SDLC (Bacastow 2008). An organized method for choosing the most appropriate fact-finding technique is necessary to collect "facts" that are important for the development of the system. To address the first objective of this study, a review of literature was conducted to investigate the career selection factors included in existing related studies. To ensure that the proposed decision-support system can capture and integrate critical factors in the decision- making process of a student, factors or features from the review of related studies were categorized into the SCCT-Choice model factors and later were validated through interview responses, shown in Figure 3.

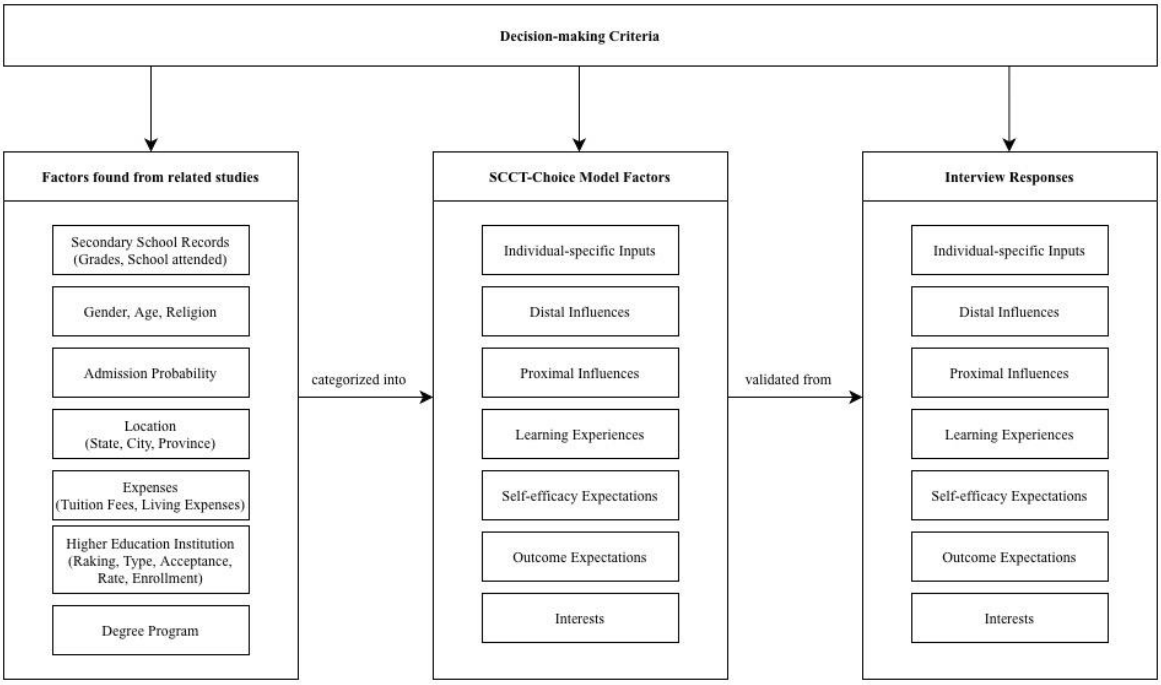


Figure 3. Triangulation of decision-making factors

Interview data were analyzed using thematic analysis with NVivo software, employing predefined themes and auto-coding to identify system requirements. These requirements were then translated into system designs through use case modeling, which visualized system functions and interactions using unified modeling language (UML). Finally, data modeling was conducted using an entity relationship diagram (ERD) to define logical relationships among system entities, serving as a blueprint for the system's physical data structure.

The system design phase began after the completion of system requirements and focused on transforming the logical model into a physical model for user testing and validation. Its primary goal was to develop a decision-support system that satisfies business requirements. As part of this phase, a user-centered interface was designed to enable users to interact with and validate system functions. The user interface was developed using Figma, incorporating requirements identified from the study participants.

The system validation phase aimed to determine user approval of the proposed decision-support system's user interface prototype. As the prototype focused solely on interface design, usability testing was not conducted. User acceptance was evaluated through user acceptance testing (UAT), recognizing the user interface as a critical factor influencing system usability. Adapted from Davis and Venkatesh (2004), a UAT survey using a 7-point Likert scale was administered to potential users who were given access to the prototype. The survey assessed acceptance in terms of perceived usefulness, perceived ease of use, intention to use, and overall aesthetics, and was deployed through Google Forms.

4. Data Collection

The University of the Philippines (UP), the national university of the Philippines, was selected as the research locale due to its large applicant population and established admission system through the UP-College Admission Test (UPCAT). This standardized admission framework provides a relevant context for examining student decision-making factors, which guided the focus of this study.

Data collection was conducted in two phases: (1) requirements discovery through interviews with students who had recent experience with the UP-admission process, and (2) User Acceptance Testing (UAT) with potential users of the proposed career selection decision-support system. UPCAT 2024 applicants, regardless of admission outcome, were eligible for the interview, while current Grade 11 students were selected as UAT participants due to their imminent

transition to higher education. A total of 12 UPCAT 2024 applicants participated in semi-structured interviews, with additional participants identified through snowball sampling. For UAT, simple random sampling was employed among Grade 11 students, resulting in 23 survey responses from users with varied characteristics.

Requirements discovery was supported by a review of related literature grounded in Social Cognitive Career Theory (SCCT) and semi-structured online interviews to identify system and user requirements. System evaluation was conducted through a UAT survey assessing user approval of the proposed interface. Tools used included Draw.io for modeling, Figma for UI prototyping, NVivo for qualitative analysis, and Microsoft Office and Google Workspace for documentation and data collection. Ethical considerations emphasized voluntary participation and informed consent. Participants were informed of the study's purpose prior to data collection, and consent was obtained before interviews and survey participation.

5. Results and Discussion

This chapter presents and discusses the findings of the study based on the literature review and semi-structured interviews conducted to examine the decision-making process of incoming college students in their career selection. It reports the results of the system analysis, system design, and system validation undertaken in this research. For clarity, the chapter is organized into three sections. The first section discusses the analysis of the case, focusing on students' decision-making processes, decisional traits, and influencing factors. The second section presents the design of the system architecture, including the requirements discovery and the development of the UP College Admission Decision-making Tool (UP-CADET). The final section discusses the results of the user interface acceptance testing and user feedback.

5.1 Overall Decision-making Process of Incoming College Students

The first section analyzes students' decision-making processes, decisional traits, and influencing factors. The system analysis phase established a foundation for developing the decision-support system by examining how students select a UP campus and degree program. Guided by the Social Cognitive Career Theory (SCCT) and its choice-making model, the study combined document review and interviews with UPCAT 2024 applicants (Table 3) to identify factors shaping career decisions.

Table 3. Profile of interview participants

No.	Sex assigned at birth	Age	SHS school strand	SHS type	Region
1	Male	19	STEM	Public General	3
2	Male	19	HUMSS	Private	4A
3	Female	18	STEM	Public Science	NCR
4	Male	19	HUMSS	Public General	4A
5	Male	18	STEM	Public General	4B
6	Female	18	STEM	Public Science	3
7	Male	19	STEM	Public General	2
8	Female	19	HUMSS	Private	4A
9	Male	18	STEM	Public General	NCR
10	Female	18	HUMSS	Private	4A
11	Female	18	STEM	Private	4A
12	Female	18	STEM	Public General	4A

Interviews revealed that students consider family, peers, personal aspirations, financial status, role models, and scholarships, though some decisions are made with little deliberation. Participants weighed these factors differently, and 75% were uncertain about their preferred degree program or UP campus, highlighting the complexity of college admission decisions. Students noted that a career selection DSS could help address barriers caused by limited information, self-efficacy beliefs, or unclear career interests.

Based on SCCT, seven major factors influencing career choices were identified and validated by participants. Students' preferences often originate from childhood aspirations, which evolve into interests and goals, but are shaped further by external influences such as family, peers, prior education, finances, proximity, and career opportunities. This understanding informed the system requirements and models for the proposed DSS.

Students' decision-making in selecting a UP campus and degree program is influenced by a combination of personal, contextual, and academic factors. Personal inputs, such as individual predispositions and, occasionally, sex assigned at birth, shape unique decision pathways. Background influences, including family guidance, peer advice, and household income, also play a significant role in guiding choices. Academic experiences, such as high school grades and senior high school track alignment, affect students' confidence and readiness for specific programs. Self-efficacy beliefs lead students to choose programs they feel capable of completing, while outcome expectations—financial benefits, employment opportunities, and social status—further inform their decisions. Personal interests and passions are considered alongside academic strengths, and proximal contextual factors, such as university location, costs, campus life, and scholarship availability, often determine the feasibility of their choices. Collectively, these factors highlight the complexity of the decision-making process and the need for a system that supports personalized and informed career selection.

The findings show that individual predispositions shape how students approach educational and career decisions. Three decision-making styles emerged from the interviews: directive, used by Participants 5 and 6 for quick, experience-based decisions; analytical, used by Participants 1 and 10 for careful evaluation of information; and conceptual, used by the remaining participants, who focus on the bigger picture and are more willing to take risks.

Participants have identified four key enhancements that could be implemented in the existing university admission system: (1) the provision of a fact sheet to assist undecided students by outlining relevant factors for consideration; (2) comprehensive descriptions of each degree program, including expectations and curricular content; (3) detailed information about each campus, particularly with respect to student lifestyle; and (4) explicit alignment of degree programs with potential career pathways after graduation. Collectively, participants affirmed that a "what-if" online tool or a virtual one-stop platform addressing college admission concerns, particularly those related to academic decision-making, would be highly beneficial.

5.2 The UP College Admission Decision-making Tool

This section presents the design of the system architecture, focusing on requirements discovery and the development of the UP College Admission Decision-making Tool (UP-CADET). Interview responses were translated into system requirements through thematic analysis, identifying recurring words, phrases, and patterns relevant to students' university and degree program decision-making. The resulting codes were organized into broader themes (Figure 4), with their relationships illustrated through thematic mapping (Figure 5).

CODES	THEMES
Admission Admission instructions College admission concerns	University Admission process
Application Application forms Application site Application strategy	Admission application
Program offerings Degree program options Campus choice	Available options
Career Career development Future career Possible career paths	Career development
College College life	College life
Course Changing courses Dream course Non-quota course Quota course	Shifting and transferring
Decision-making Academic decision-making Decision-making process Decision process Process Experience Assistance Advice Uncertainty	Educational career decision-making process
Degree-program Preferred degree programs College major STEM-related degree programs HUMSS-related degree programs Medical-related course Pre-medicine course	Preferred degree program
Established factors Family Self-efficacy Proximity Academic credentials Financial consideration Interests Strengths Weaknesses Priority	Influencing factors

CODES	THEMES
Financial consideration Financial aid	Financial consideration
Living Daily living expenses Living arrangements	Living arrangement
Online Online application portal Online tool	Online tool
Scholarship grants Scholarship opportunities Available scholarship grants	Scholarship grants
Social media Reach	Social media
Strategy Application strategy Quota-based strategy	Application strategy
System Notification system Goal features	Engaging features
Technology Technology intervention Virtual one-stop technology Online tool Access Privacy Convenience	Virtual one-stop technology
Academic credentials Weighted School Average	Educational background
Campus choice	Campus choice
Proximity Home	Geographical location
Information availability Information Awareness Access	Information availability
Preferred degree program Campus choice Choice	Decision

Figure 4. Categorization of codes into themes

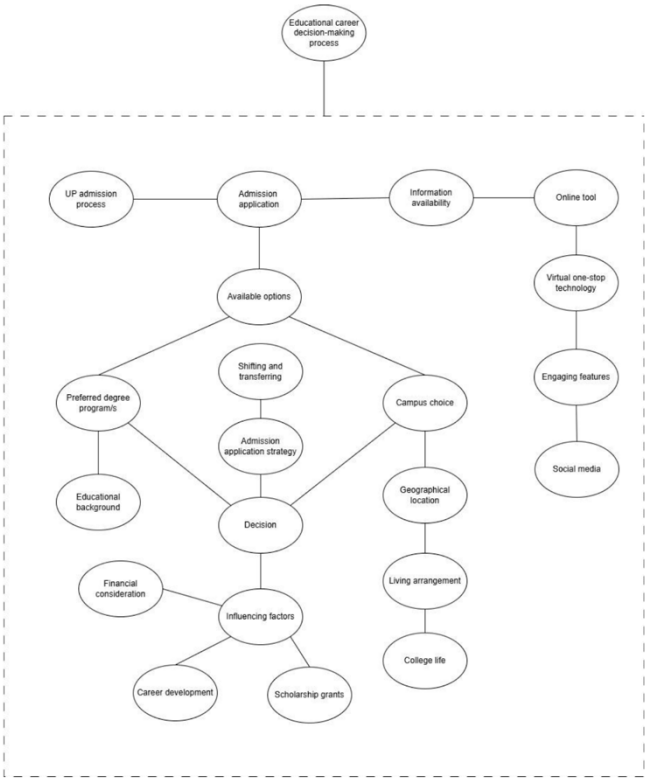


Figure 5. Thematic mapping

The thematic mapping shows that educational career decision-making begins with the choice to pursue UP admission, followed by information seeking, application, and campus and degree program selection influenced by various contextual factors. From this process, five key information needs were identified: campus selection, degree program selection, future career paths, scholarship and financial aid opportunities, and expected costs. These themes informed the formulation of business requirements, which were further translated into user and system requirements, defining both the functional capabilities and quality attributes necessary to support effective user interaction and decision-making.

Use cases were employed to model user requirements by describing the interactions between system actors and the UP-CADET. A use case represents the steps through which an actor initiates a system function, helping clarify user needs and expectations. In this study, two system actors were identified (Table 4).

Table 4. Actor glossary

Term	Synonym	Description
System User	User, Incoming college student, Freshman, Student	A system user who navigates the application and requires assistance in order to generate a decision for university admission.
System Administrator	Admin, ICT Coordination, IT	A system user who handles and manages all information and processes within the system.

Seven subsystems were defined through use cases: user registration, account setup, account dashboard, campus selection, degree program selection, scholarship and grant options, and career paths. Figure 6 illustrates the use case diagram for the campus selection subsystem, where the system user can edit their address to accurately display map markers showing their location and the eight UP constituent universities. Through this interface, users can select a campus based on proximity or access additional campus information to support informed decision-making.

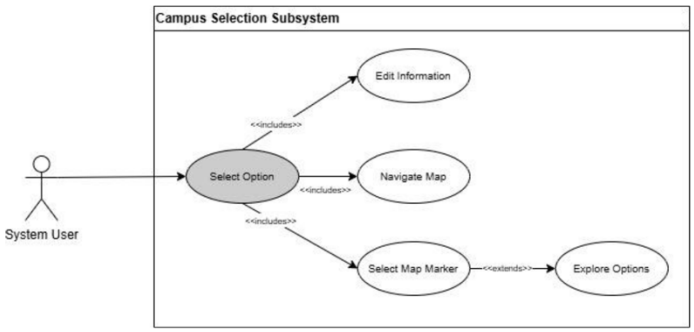


Figure 6. Use case for the campus selection subsystem

Following user requirements modeling, data modeling was conducted to define the logical structure of the system and illustrate the relationships among entities and attributes. This process ensures that the system architecture supports the identified business processes and objectives. An entity relationship diagram (ERD) was developed as the blueprint for the system's physical data structures.

The ERD was analyzed across five segments: account setup, campus selection, degree program selection, decision results, and notification setup, with emphasis on the campus selection component. Figure 7 presents the campus selection ERD, which consists of eight interrelated entities. Factors such as college life, campus culture, facilities, university spots, and student organizations were modeled as key attributes influencing campus selection, reflecting the system's business requirements.

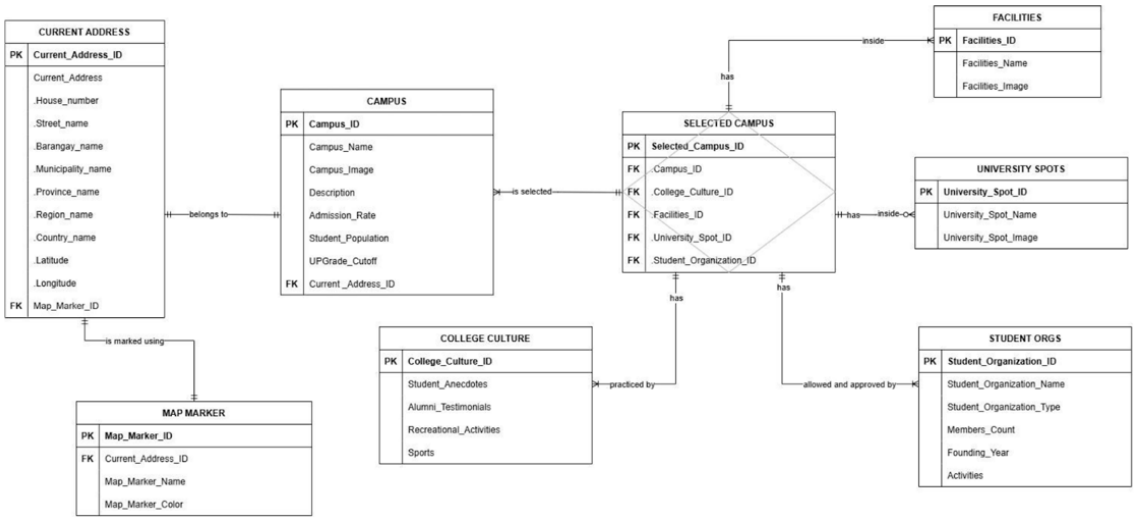
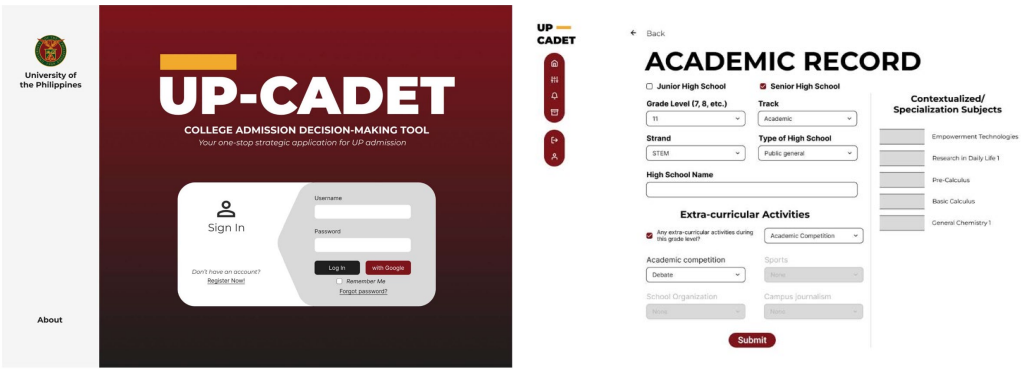


Figure 7. Campus selection ERD

This subsection presents the user interface (UI) prototype of UP-CADET, illustrating key screens, controls, and features that support users' career and campus decision-making. Mock data were used for demonstration purposes; thus, all information shown in the prototype should be interpreted cautiously.

The user journey begins at the User Login Page (Figure 8a), where users may log in using existing credentials, register a new account, reset forgotten passwords, or access the system through Google sign-in. Account registration requires basic personal information and agreement to the terms and conditions, followed by email verification. Users may then create and manage their academic records (Figure 8b) by inputting high school details, track, strand, and grades, with flexibility to edit entries as needed.



(a) (b)

Figure 8. (a) UP-CADET login page; (b) UP-CADET academic record page

The UP-CADET Dashboard (Figure 9) serves as the home page, providing an overview of system features and access to the decision-making tools. The core functionality of the system is the Decision Filter Page (Figure 10), where users rank decision criteria such as campus, degree program, costs, scholarships, and career paths. Based on these rankings, the system progressively narrows options and generates decision results aligned with the user's priorities and SCCT-based factors. Users may explore up to 120 possible ranking combinations, enabling comparison across alternatives and helping reduce information overload and decision uncertainty.

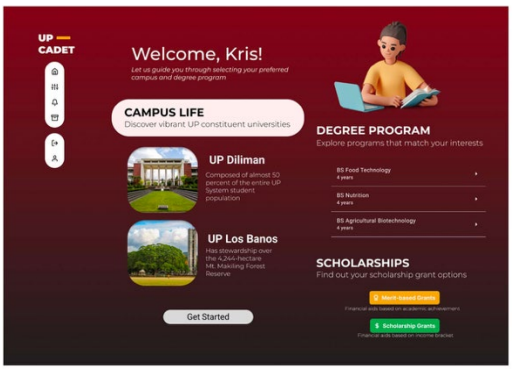
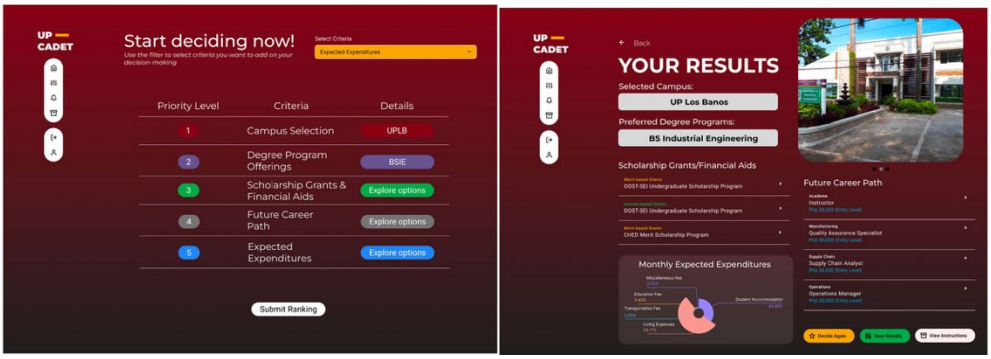


Figure 9. UP-CADET home page



(a) (b)

Figure 10. (a) UP-CADET complete decision filter page, (b) UP-CADET Decision result page

Figure 11 illustrates the general system architecture of UP-CADET, adapted from Aqel et al. (2019). User requirements informed the design of the UI prototype using Figma, reflecting the system users' perspective. The backend component supports data processing, server-side logic, and application security, ensuring the system's functionality and performance.

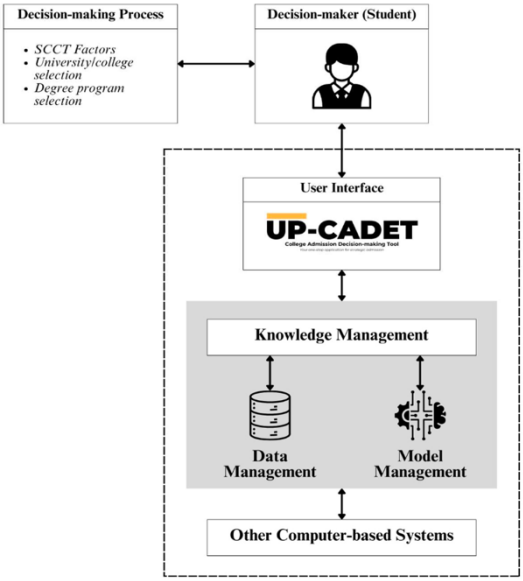


Figure 11. General DSS structure of UP-CADET

5.3 User Acceptance Test

This section discusses the perceived usefulness of the UP College Admission Decision-making Tool (UP-CADET) based on user acceptance testing results. The results indicate a high level of perceived usefulness of UP-CADET among users. Consistent with Davis and Venkatesh (2004), perceived usefulness reflects the extent to which users believe that the system enhances their decision-making performance. Most respondents reported that using UP-CADET improved the quality and effectiveness of their decisions in selecting a UP campus and degree program, with approximately 96% expressing positive perceptions across these measures. Additionally, 82% of respondents indicated that the system increased their confidence in their UPCAT application, while only a small proportion expressed neutral or slightly negative views. Overall, these findings suggest that UP-CADET is viewed as a useful tool that effectively supports and facilitates students' career and campus selection decisions.

The results indicate that UP-CADET is generally perceived as easy to use. Most respondents found their interactions with the system clear and understandable (96%) and reported that using the system required minimal mental effort (92%). All respondents (100%) agreed that UP-CADET is easy to use, while a majority (87%) also found it easy to get the system to perform desired tasks. Only a small proportion of respondents expressed neutral or negative views, suggesting minor usability concerns. Overall, these findings demonstrate that UP-CADET's interface effectively supports ease of use and promotes positive user interaction.

The results show a strong intention to use UP-CADET among respondents. About 91% indicated that, if given access, they would use the system to facilitate their decision-making, while 87% predicted they would use it for the same purpose. A small portion of respondents remained neutral, suggesting minor hesitation, but overall, the findings indicate that users are likely to adopt UP-CADET as a helpful tool in their career and campus selection process.

The results show that users are highly satisfied with the aesthetics of UP-CADET. All respondents (100%) found the overall design attractive, appreciated the color combinations, and reported that texts and commands were clear and readable. These findings indicate that UP-CADET successfully meets user expectations for an appealing and user-friendly interface, with no issues reported regarding readability or visual presentation.

Overall, users are amenable and depict their positive views about the perceived usefulness, perceived ease of use, intention to use, and general aesthetics of UP-CADET. While improvements can be made to further increase users' confidence in their decision-making using UP-CADET, it is still significant to note that users view the proposed system with an optimistic perception.

5.4 Proposed Improvements

Although the study has led to some significant findings, several points for improvement can still be addressed. Future studies may address the limitations of this research by enhancing both the methodological and system development aspects of the proposed decision-support system. Additional fact-finding techniques, such as focus group discussions and surveys, may be incorporated alongside interviews to strengthen requirements elicitation and validation. The study limitations included small sample sizes in collecting the user requirements and user acceptance test. Expanding the sample size and including participants from varied age groups and educational backgrounds may further improve the generalizability of findings and capture broader career decision-making contexts. System enhancements may also include the integration of career-oriented questions to support deeper career exploration beyond academic performance indicators. Moreover, incorporating results from national assessments such as the National Admission Test (NAT) and the National Career Assessment Examination (NCAE) may allow for a more comprehensive, nationally applicable decision-support framework. Finally, future research may extend beyond interface design by conducting in-depth investigations into system algorithms, backend architecture, implementation, and deployment. Such efforts would enable the development of a fully functional and reliable decision-support system, providing stronger empirical evidence on its usability, performance, and practical applicability.

6. Conclusion

Career decision-making among incoming college students is a complex process that involves evaluating multiple academic, institutional, and personal factors. In the context of Philippine State Universities and Colleges (SUCs), the availability of diverse degree programs and campuses highlights the need for a structured, user-centered decision-support system to assist students in making informed academic choices. This study designed a decision-support system (DSS) architecture to support incoming college students in selecting appropriate degree programs and campuses in

Philippine SUCs, with the UP serving as the case site. Through a user-centered approach, the study identified and translated student perspectives into clearly defined business, user, and system requirements. The UP-CADET user interface prototype operationalized these requirements into an intuitive platform that enables users to explore options and navigate the career selection process effectively. User acceptance testing results indicate positive perceptions of the system's usefulness, ease of use, intention to use, and overall design, suggesting strong potential for adoption. Overall, the study contributes to decision-support system development by demonstrating how critical academic, institutional, financial, and career-related factors can be systematically integrated to support informed and confident career decision-making among incoming college students.

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