

Web-Based Counseling Technology Development with Object Oriented Framework

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Abstract

The design and adjustment of information systems are presently undergoing a transformation following the particular problems they are intended to tackle. The objective of this paper is to elucidate the terminology employed in the development of an information system. In the past ten years, there has been a significant increase in the popularity of building information systems. There have been numerous suggestions offered, each exhibiting different attributes. The counselling information system had made by using a method that focuses on organizing information clearly and simply. The main goal of this research is to find solutions to the problems and needs of creating new systems. Modelling in system development helps us use different modelling languages to solve problems. This starts with identifying issues using use case modelling languages, then simplifying problems with structured modelling, and finally creating communication patterns or interactions between objects using sequence diagrams. By designing this system, we have provided a means to comprehend the intricate nature of information systems, particularly when it comes to counselling information.

Keywords: Information Systems; Counseling Information; Object Oriented Analysis; Complexity Systems.

INTRODUCTION

The necessity for innovation, and particularly data was expanding (Taibi, 2022). Enhancements not as it were in one division but in other divisions such as counseling administrations. Counselling administrations are exercises that require media as a implies of conveying data (Muserra, 2020). Currently, counselling contains a requirement for innovation that can pass on information (Crilly, 2020). There are two clients when it was associated and associating to innovation, particularly data, be specific the counselee is an individual or client who is given administration, while the counsellor may be an individual who includes a duty to supply ethical help to the counselee to assist the issues (Wager, 2021). The imperative thing is communication in expansion to conveying data which needs media. Hence, counselling and data innovation are unused requests when confronted with the millennial era (Stankov, 2020).

Typically, counselling involves engaging in face-to-face conversations with an individual. Most people can talk to a counsellor. Although there are benefits to in-person counselling, there are also a few disadvantages associated with it (Casares JR, 2020).

Sometimes, people who need counselling have trouble finding time to talk to the counsellor. Moreover, the lack of planning poses difficulties for individuals attempting to arrange a counselling session (Soller, 2023). Some people can't tell their counsellors everything because they want to keep their personal information private. Both Miscommunications and misunderstandings can occur between individuals seeking counselling and their counsellors when they encounter difficulties in effectively communicating with each other. The identification of these problems and weaknesses will contribute to the initiation of a counselling information system (Leo, 2022).

Considering the limitation of the system to address user demands is an essential aspect to bear in mind during the process of system development (Jerman, 2020). The delivery time is not good because it takes a long time to develop. Subsequently, users are required to participate in the system development phase, leading to an extensive update process that demands substantial time investment.

Building and creating a counselling data framework is exceptionally imperative. The utilizations of the waterfall strategy is considered to as it had useful execution indeed even though the application is run on a web-based. The shortcoming is that it as it is recorded, records information on the arrangement of sanctions so that it looks like a virtual counselling police. Particularly for wants and targets, the framework built is as it were for tall school children, not for the open. Another strategy in framework improvement is the utilisation of the Framework Advancement Life Cycle (SDLC) which is nearly the same as the waterfall proposed by Nike Mardia Putri et al. The most concern is how to utilize advancement methods which are not particularly portrayed when receiving organized advancement. Hence, the comes about of the improvement is not synchronous, specifically organized advancement but the advancement method embraces a question- arranged approach. Advancement of object-oriented frameworks where frameworks that centre on client needs and exercises are still few when connected to the field of counselling (Hulukati, 2020).

Developing coding languages and database systems utilizing PHP and MySQL, or selecting a relational database. According to research and reading, it has been found that a systematic approach is typically followed in the development of information systems. The structured method has some weaknesses. It doesn't explain what users do when they are involved in it. Additionally, conventional programming languages are still regarded as outdated due to their emphasis on step-by-step approaches to accomplishing particular tasks (Løberg, 2021).

RESEARCH METHOD

The process used to construct and design this counselling information system is referred to as Object Oriented Analysis and Design (OOAD) (Shan, 2023). It is important to review the criteria for different classes and objects required in the problem. The way an information system is structured depends on how things are organized and managed within the system. OOAD involves addressing weaknesses or problems through the utilization of models that depict real-world concepts, presenting a fresh approach to finding solutions. The main concept of OOAD design revolves around the organization and utilization of information within an entity (Hidayat, 2021).

Identifying the stages involved in developing protocols and selecting appropriate strategies for visualizing a model. There are multiple methods to construct models using UML as the shared language in this particular circumstance. The practice of use case modelling serves to elucidate the specifications and assessment of the system currently under construction. Moreover, when analyzing structures, the formation of classes involves including objects (Edward, 2022). Counselling information systems are responsible for establishing significant interactions between individuals and machines. The last approach involves employing tools for modelling, especially by utilizing the Unified Modeling Language. There are three categories of modelling languages utilized: languages consisting of class diagrams, languages consisting of interaction diagrams, and languages consisting of sequence diagrams (Chabibah, 2021).

Information System Development Method

The development of an information system, particularly in counselling, is guided by three main principles in this study. There are three principles, namely process, representation, and technique (Davis, 2019). The initial principle discusses the unified process, which is utilized to generate a design model. Describing the design model is the focus of the second principle when it comes to employing UML. Ultimately, a strategy is available that reveals the model's ability to accommodate distinct factors, including processes (Berdik, 2021).

Information System Modeling Language

Designing a counselling information system involves a process similar to that of developing software. Modelling holds great importance in both software development and systems. Modelling can only be done when using a special type of language called modelling language (Garousi, 2019). The researchers utilized the Unified Modeling Language to demonstrate the development of a counselling information system in this study. In the construction of information systems, a modelling language is utilized, which encompasses three key areas. Three diverse categories include: use case modelling, structured modelling, and dynamic modelling.

Use Case Modeling

The use of use cases as a technique for representing ideas is widely embraced and advocated by professionals and scholars who are not necessarily involved in the field of computing. The process of use case modelling assists in determining and articulating the required functionality of a system. Use case modelling is not limited to software and can be adapted for any form of information system.

We create the use case model by considering many factors (Cuzzocrea, 2020). First, explain the problem of the counselling service case, from when the person seeking counselling starts their sessions to when they feel happy with the help they received from the counsellor. Next, determine the main people involved and the situations they will encounter. The primary individuals involved are counsellors, individuals in search of guidance, administrators, and administrative assistants. Moreover, the process of identifying use cases requires observing user behaviour within the counselling system, such as engaging in conversations with counsellors, accessing their scheduled appointments, registering for new appointments, and requesting cancellations. Next, make a use case and describe it (Shakhovska, 2019). Each use case will have a number, a name, and a description. After that,

the counselling system service use cases are to be assessed and categorized as either low, medium, or high priority levels in order to assign importance.

Structured Modeling

The initial step in use case modelling is the process of elicitation, occurring before structured modelling. Structural modelling can be described as a sophisticated approach that remains consistent and unaltered. Unlike other modelling methods, object-oriented analysis is distinct in its approach. Structured modelling is a way to understand and identify all the parts of a system using objects or abstract ideas. Objects or ideas might be considered distinct entities until they are categorized into a specific group. Structured modelling techniques help figure out how the model is created. To create a class, start by finding the common characteristics or features of objects. So, the counselling service problem will be described regarding the thing and its category.

Additionally, this counselling service will have three main categories that will be created based on the use case. Class and object identification is a part of defining the problem (Maulana, 2020). Furthermore, the creation of a data dictionary helps describe the various categories and components of counselling. The addition helps to connect the different classes. Associations provide details about how different classes interact with each other. An association refers to the advice provided by a counsellor when a person seeks guidance (Abidin, 2020).

Dynamic Modeling

Dynamic modelling and structured modelling should be understood as separate concepts. Class diagrams serve the purpose of illustrating the unchanging components of the system in static modelling (Ozel, 2021). The class diagram visually presents the connections among the different classes. However, the class diagram does not tell us about how the system works or changes over time. For instance, in the counselling information system, how does the counsellor's staff work with other things, like the person getting counselling?

Dynamic models can be used to describe how objects interact when a specific situation happens. Dynamic modelling in the development of counselling information systems means creating situations for how the system will be used, based on diagrams showing different uses of the system. Next, create a level 2 diagram that shows the sequence of actions. The level 2 diagram shows where the actor gives input and where the system responds. Third, at level 3, we can use the same method as level 2, but it's not mandatory. It implies that minimal effort is required to enhance the counselling system at this stage. Subsequently, generate state machine diagrams for each sub-system to analyze the modelling with the help of those diagrams.

RESULTS AND DISCUSSION

This section delves into the research findings and delivers a thorough analysis. The information can be effectively presented through visual aids such as pictures and charts, facilitating reader comprehension. There is a range of subjects that can be discussed in this conversation.

Employing Use Case Modeling in Real-World Scenarios.

In the process of use case modelling, two crucial participants are the individual seeking advice and the individual providing guidance. When individuals encounter personal difficulties, they turn to counselling services and become counselees (Yang, 2021). Personal problems can be resolved with the aid and support of counsellors, as they are skilled individuals who offer guidance and assistance. The person seeking guidance and the person providing guidance have different situations where they are used and are connected to other situations where they are used. However, the use case diagram has a problem. The conversation between the counsellor and the person receiving counselling is not illustrated (Hrabovskyi, 2020).

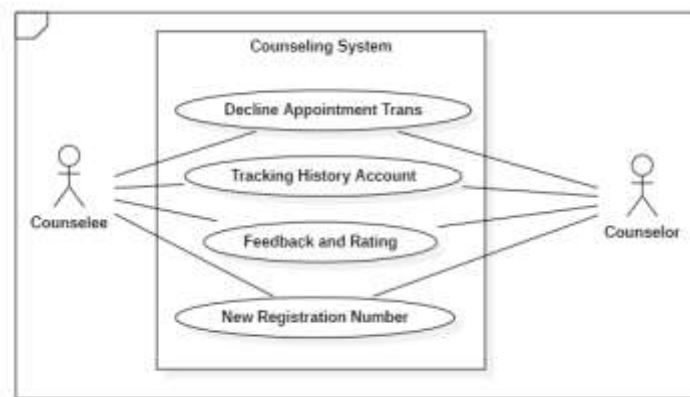


Figure 1. Modeling Of the Counseling Information System Use Case

The use case modelling stage involves utilizing the use case model to resolve the challenge of defining general requirements, as shown in Figure 1. In terms of the counselling information system, certain essential requirements define its functions and cater to user needs (Foster, 2021). Following that, it is necessary to elucidate the requirements by articulating how the system is expected to cater to the user's needs. Two primary individuals play a pivotal role in the development of a counselling information system: the counsellor and the person receiving counselling. The system will encompass a description for every actor, outlining their requirements.

Utilizing an Organized Strategy to Construct Models

When compared to static modelling, structured modelling emerges as a stronger and more widespread modelling approach (Wang, 2022). Class diagrams in structured modelling are used to explain the names of classes, their attributes, and the operations they can perform. The name of the class is connected to the name of the actor in the scenario. Attributes are like qualities that describe a class, and operations are things that a class does or is connected to. There are many specific things connected to Figure 2. In this development, structured modelling is used to create class models that represent the structure of something. Anything that has to do with a thing or a concept will be considered a group or category. Class is a group of things. According to Figure 2, six different classes have been identified. These classes are called account, counselling, consultation_status, feedback, counsellor, and counselee (Trisolini, 2021). The group of people who receive advice and those who give

advice is a broader category that includes the group of people with accounts. The class diagram in Figure 2 illustrates that there is a connection between classes. For instance, the account class can only be used once to give feedback on counselling services. This is known as one-to-one communication. There are some other groups that show a one-to-many relationship, like when account classes can be checked multiple times.

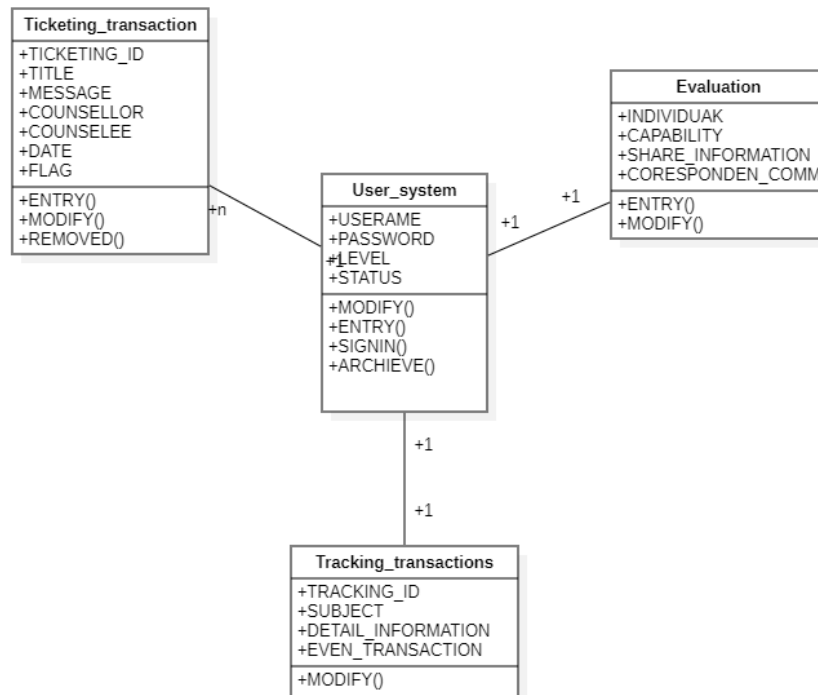


Figure 2. Structured Modeling with Class Diagrams

The designations of the accounts, referred to as counselees and counsellors, have been broadened. There are certain resemblances between the counsellor class and the group of individuals seeking counselling. However, when it comes to the operation section, various things are different. The person seeking help can talk to the person advising a meeting or conversation. Moreover, the classification of consultation as a group is meant to decide the importance of the information shared by the person seeking advice to the person providing guidance (Fu, 2019). The feedback class is a class that connects a counsellor and counselee to get feedback from the counselee about the counsellor. The feedback class encompasses diverse characteristics, such as individual attributes, abilities, effective communication, and language proficiency.

Dynamic Modeling

As we mentioned before, dynamic modelling shows how objects in a system interact with each other. Figure 3 shows and describes the people who can use the system for signing up. The person giving the orders tells the computer to type in a name and secret code. Then the system gets the command and replies. For instance, the system will give a response if someone tries to use a username that has already been used during registration. Another example is when you log into the system, which is done in the same way as registration. The person types in their username and password, and we check if it matches the information in our database.

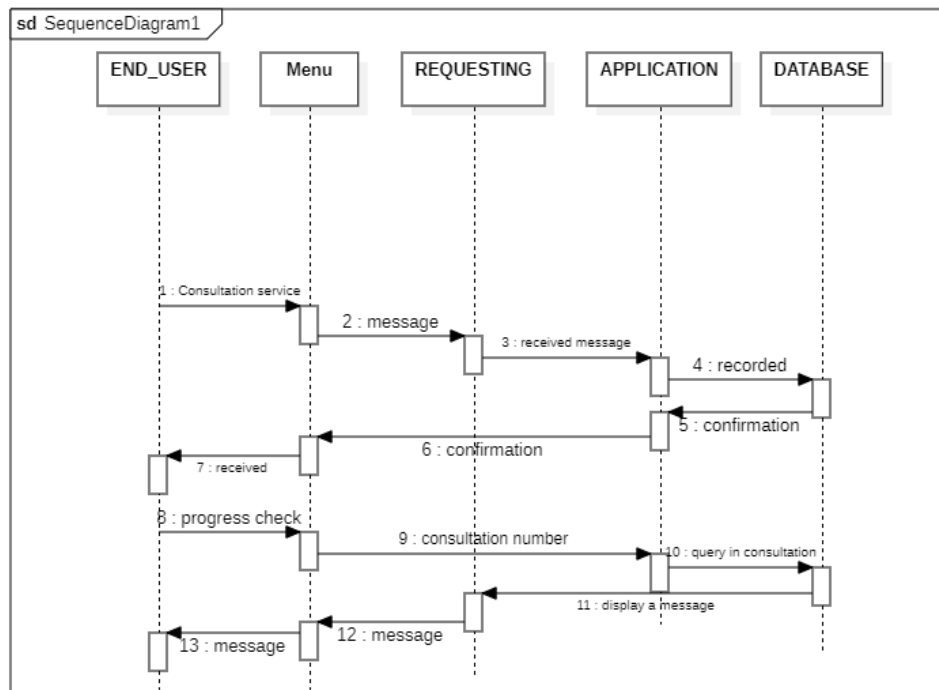


Figure 3. Dynamic Modeling with Sequence Diagram

Counseling Information System Implementation

Figure 3 showcases the consequences of developing a system to offer counselling information (Kayali, 2020). The process of creating something necessitates the crucial step of programming. This website uses a programming language called PHP. The data stored in a database can be managed and organized using an application called MySQL, resembling a container for storing information.

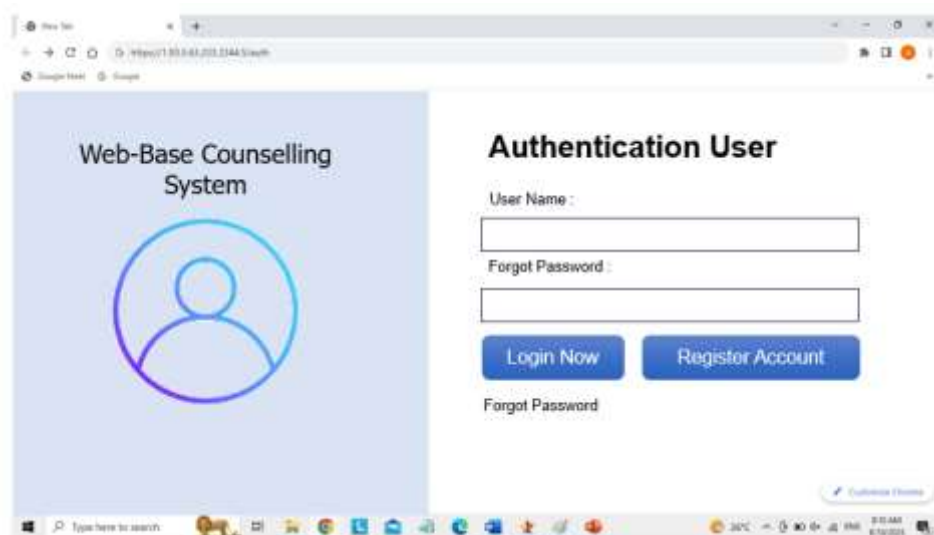


Figure 6. Display of the Counseling Information System Login Page

Clients can enter their username and password when logging in. In case you do not have an account, each planned client can press the enrollment button. The enrollment page

will have appeared in Figure 6. The enlistment page contains clients to enter information counting individual, and other increments. On the enrollment page, the client, to begin with, enters the username to check accessibility. Each username entered will be coordinated with the username database within the counselling application. There are two status usernames, specifically utilized and prepared to utilize. In case the username status is utilized, it implies that the username entered has been utilized by other clients in this counselling framework. Whereas the status of the username is prepared for use, it implies that the username entered isn't however accessible and has not been utilized by other clients. In this way, the client can proceed with charging advance.

Client enrollment is an additional portion of the utilize case. Moreover, enrolled clients naturally have an account (Account) as a class. The Account lesson features a client protest (counsellor and counselee). In this way, this account lesson is the result of the plan and reflection of organized modelling and utilizes case modelling. One form of dynamic modelling usage. A client (counselee) employments a utilised case that alludes to a counsellor (Lüdecke, 2021). Even though utilize cases can clarify what the counsellor and counselee do. Energetic modelling employment arrangement charts that clarify the arrangement of forms carried out by the counselee amid the interview. Another extra utilize case is that the client as a counselee can check the advance of counselling administrations. The meeting advance handle can be gotten to by the counselee to see the status of the meeting and whether the counsellor has reacted or not. In expansion, the counsellor or counselee can too choose whether the discussion can proceed.

Testing and Implementation

Testing is the foremost imperative and numerous time would be charge within the following arrange. The assessment as a portion of advancement of data framework that decided the appropriate of prerequisite (Zeng, 2022). In this case, the strategy of testing and assessment alluded to standard of computer program testing such as black-box testing. The black-box testing empowered the execution of data system that proposed through a few step. The following may be a table the plan parameter within the data framework testing agreeing to the necessity. There are 12 thing information were arranged in arrange to approval in testing. In this organize, the assessment or testing required full time.

Table 1. The Measure Used to Test and Create an Information System.

ID	Scenario of Test	Description of Parameter on the Test	Expected Result
1101	Account registration	Type in your username and password on the form. This is a page where you can make your own account. Next, press the go-ahead button. People fill out the form.	The system reads the username that you submit.
1102	Filling in registration data	Upon confirming the readiness and accuracy of the username, users or testers proceed to enter specific information.	Before being stored in the database, each piece of information is kept in particular variables.

1103	Username check Stage 1	During the sign-up process, you are required to enter a username of your choice. After that, the system verifies if the username is available or already taken.	The usage of the username allows for its visibility and identification.
1104	Username check	In order to confirm its availability, the system searches for a username in the database's user table. There are a couple of approaches by which the system showcases messages.	Messages become visible on the screens of system users.
1105	Consultation submission	The person seeking advice (counselee) sends a request for help. text, (2) identify or complete the form, (3) add or write in the missing information, and (4) submit or send the completed form. The text could be rewritten as: (1) Meeting or discussion, (2) Name of person who gives advice, (3) Appointment request.	The details from a consultation are saved in a database dedicated for consultations.
1106	Check the counselee consultation	The counselor puts in the Consultation ID or consultation ticket in the text box.	The ticket ID is used by the system to present information pertaining to consultations.
1107	Check Counseling Progress	When a person seeks counseling, they can access their personal information page and select the option to view their counseling progress.	The system shows information about consultations and how they are going.

By examining table 2, it is possible to ascertain if the information system has been tested. In order to ensure the system's reliability, we conducted extensive tests in nearly every scenario (Fadoli, 2020).

Table 2. Testing and Designing of the Parameter for the Result Information System Requirement

ID	Scenario of Test	Expected Result	Result	Progress
2001	Account registration	The system takes in the username that is proposed (submit).	Identified data achieved	100 %
2002	Filling in registration data	Each data or information thing is put away in parameter factors some time recently being	the system ability to record	100 %
2003	Username check Stage 1	The username can be examined and identified when it is utilized	Displaying information status	100 %
2004	Biodata User profile	Database performance to present about data	Displayed information	100 %

2005	Consultation submission	Discussion data is put away in a counseling database	the system ability to record	100 %
2006	Check the counselee consultation	The framework shows meeting data based on the ticket IDE	Displayed information	100 %
2007	Check Counseling Progress	The framework shows meeting data and advance	Displayed information	100 %

CONCLUSION

Difficulties arise and a significant amount of time is required when developing information systems. By utilizing use cases, structured and dynamic modelling illustrates the process of creating the system. By increasing efficiency and decreasing costs. Use case modelling and structured modelling are methods that make complex systems easier to understand and analyze. Additionally, the use of the two models enables the person involved in system design to grasp the specific focus within counselling services. When creating communication systems, it is crucial to focus on dynamic modelling. The task involves grasping the connections between different objects. Objects can talk to machines or people as system users. Despite being programmed in a programming language, the machine is capable of responding to the user.

An object-oriented approach was employed to create this system. However, there are still some restrictions. It is crucial for future research to concentrate on developing databases that effectively structure information for user-friendly access and comprehension. The explanation for this is because of the way we currently organize information in relational databases. Object-oriented databases must be developed concurrently with object-oriented systems, despite the widespread use and popularity of relational databases.

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