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Research Article

The Efficient Counselling Session and Information System (SESIQ-UPK)

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Abstract: *The Efficient Counselling Session and Information System (SESIQ) is a digital innovation designed to improve counselling management efficiency, organization, and professionalism. It addresses challenges in conventional record management, including limited accessibility, inconsistent records, delayed reporting, and data errors. Developed using HTML5, CSS3, JavaScript, and Google Firebase, SESIQ supports interactive interfaces, user authentication, and digital data storage. The Prototype Model guides development through iterative testing and improvements based on feedback from the Psychology and Counselling Unit (UPK). By prioritizing confidentiality and systematic record management, SESIQ has the potential to strengthen digital governance and enhance counselling service quality within educational institutions.*

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1. INTRODUCTION

The delivery of counselling services in higher educational institutions play a fundamental role in in ensuring continuous support particularly concerning students' psychosocial well-being, personal potential development and establishing academic and career pathways throughout their study years and transitional period of going into workforce. In the context of technical and vocational training (TVET) specifically vocational colleges, the extension of counselling services proceeds beyond emotional well-being, it's the embodiment of addressing learning challenges, educational adjustment, interpersonal relationships, character development and career preparation. Due to array of counselling services prerequisite, the efficient, systematic and professional management of well-organized information and documentation is significantly called for.

As the counselling services' commitments resumes to grow, one of the paramount importance for the counsellors is the management of counselling session records and student information components. Comprehensive and well-organized records enable counsellors to retrieve information from previous sessions to support intervention planning, monitor students' progress, and prepare counselling service reports. However, conventional record management practices or decentralized information storage may present several challenges, including difficulties in retrieving information, inconsistency in documentation, records duplication, report preparation delays and data errors. These limitations may affect the efficiency of counselling administration and complicate information coordination among counsellors.

Nonetheless, corresponding to the evolution of digital technology, prospects of enhancement for record management practices through the implementation of web-based systems that facilitate more systematic information storage, management, and retrieval is deemed applicable. Digitalization is not merely a transition from physical documentation to electronic records; it also has the potential to streamline workflows, standardize record-keeping procedures, and enhance information management efficiency. Nevertheless, the implementation of digital systems in counselling services must take into consideration confidentiality, data security, and access control, as counselling records contain students' personal and sensitive information.

For that reason, this paper aims to describe the development of SESIQ UPK as a digital solution to address the challenges of counselling record management at Kolej Vokasional Pasir Mas. It also focuses on the system's functionalities, development approach, and usability evaluation by its target users, particularly UPK counsellors. This evaluation is essential to determine the extent to which the system meets user requirements, facilitates record management, and supports existing work processes. Through its development and evaluation, SESIQ UPK is expected to serve as a practical approach to strengthening the digitalisation of counselling service management in TVET institutions, while providing a foundation for continuous system improvement based on user feedback and evaluation evidence.

2. LITERATURE REVIEW

2.1 Previous Research Analysis

There are several previous studies available which establishes the foundation of SESIQ UPK development.

The drive of digital technology advancement has granted the expansion of various systems to improve the efficiency of counselling service management. Contextually, a study by Alias et al. (2024) introduced the *easecounsel* application to support counselling record management and service delivery, while Zulkefli and Mohd Aman (2025) developed *rekodweb* to streamline client record management, monitoring, and reporting. Both studies demonstrate that digitalization has the potential to serve as a practical approach to addressing the limitations of manual record management. However, the development of digital systems across different platforms and operational contexts requires evaluation based on the actual needs of organizations and their target users.

Although previous studies have provided a relevant foundation for the development of counselling management systems, there remains an opening to explore the suitability and usability of such systems within the specific context of technical and vocational education and training (TVET) institutions. In particular, the record management needs of the Psychology and Career Unit (Unit Psikologi dan Kerjaya, UPK) at Kolej Vokasional Pasir Mas need to be evaluated based on actual work

processes, including session information management, authorized counsellors' access to records, documentation consistency, and report preparation. This statement represents a contextual research gap that needs to be validated through user needs analysis and further examination of the relevant literature.

Furthermore, the evaluation of digital mental health technologies should consider not only technical functionality but also usability, accessibility, and privacy concerns. Catania et al. (2024) identified these factors as important considerations in the evaluation of digital mental health technologies. Therefore, the development of a counselling record management system should be accompanied by an appropriate empirical evaluation to determine whether the system meets user requirements and supports established work processes. Evidence from electronic health record research indicates that poor interface usability and fragmented information can disrupt workflows, increase documentation burden and contribute to data-entry errors (Olakotan et al., 2025).

Accordingly, this study focuses on the development and evaluation of the Efficient Counselling Session and Information System (Sistem Efisien Sesi dan Informasi Kaunseling, SESIQ UPK) at Kolej Vokasional Pasir Mas. The study examines the system's record management functions, its usability among counsellors, and the efficiency of performing tasks related to counselling documentation. Through this evaluation, the study is expected to provide preliminary evidence regarding the suitability of a web-based system for supporting counselling record management in a TVET environment. The findings may also serve as a foundation for further system improvements based on user feedback and actual operational requirements.

2.2 Confidentiality and Case Record Management

Schneider (2022) emphasized the importance of considering privacy, confidentiality, and ethical aspects in the management of digital client records. In the context of SESIQ UPK at Kolej Vokasional Pasir Mas, these aspects configure the foundation for amplifying a more systematic counselling record management system, with an emphasis on protecting students' confidential information and ensuring that such information is used in accordance with professional counselling requirements.

2.3 Data Quality in Electronic Record Systems

Penev et al. (2024) justified that data quality in electronic record systems should be evaluated based on aspects such as completeness, format compliance, and information accuracy. These principles are relevant to the development of SESIQ in supporting more organized and consistent counselling record management. A systematic review of health information systems identified accuracy, completeness, consistency, timeliness and reliability as important dimensions of data quality, providing a useful basis for evaluating the quality of counselling records maintained by SESIQ (Ghalavand et al., 2024).

3. PROTOTYPE METHODOLOGY FLOWCHART FOR SESIQ UPK

Commissioned by prototype methodology and manoeuvred by sets of system, SESIQ is distinctly structured as a digital counselling-record management coordination developed to improve the efficiency and organization of counselling services at Unit Psikologi dan Kaunseling (UPK), Kolej Vokasional Pasir Mas.

3.1 Explanation of the Prototype Model

The Prototype Model is a software development approach in which an initial version of a system is developed, evaluated by users and refined iteratively until it meets the identified requirements.

For SESIQ, this approach is appropriate because the system is intended for use by UPK counsellors whose operational needs, record-management practices and expectations must inform the design. Active end-user involvement is an important aspect of software prototyping, as it enables users to contribute meaningfully to the development and refinement of the system (Selamat et al., 1994).

The methodology consists of six main stages.

Stage 1: Requirements Identification

The development process begins by identifying the existing challenges in counselling record management. Discussions with UPK counsellors can establish the system's functional requirements, including user login, counselling-session records, case information, record retrieval and report preparation. The requirements should also address non-functional aspects, including usability, reliability, confidentiality and access permissions.

Stage 2: Initial System Design

The system structure, interface layout, database organisation and navigation are planned according to the identified requirements. The initial design should define the different user roles and the information each role is authorised to access.

Stage 3: Prototype Development

An initial working version of SESIQ is developed using HTML5, CSS3 and JavaScript for the user interface, with Google Firebase supporting authentication and digital data storage. The prototype incorporates the selected functions required to demonstrate the proposed counselling management process. Development should prioritise the core features before additional functions are introduced.

Stage 4: User Evaluation

UPK counsellors evaluate the prototype through structured testing. They examine whether the system functions as intended, whether the interface is easy to use, whether records can be retrieved accurately and whether the system supports their actual work processes. Feedback is documented systematically to identify weaknesses and areas requiring improvement.

Stage 5: Prototype Refinement

The prototype is revised based on the evaluation findings. Improvements may involve interface design, navigation, data validation, record management, access permissions and error handling.The revised prototype may undergo another evaluation cycle if significant problems remain. This iterative process continues until the agreed acceptance criteria are satisfied or the project reaches its defined development limit.

Stage 6: Final Validation and Documentation

The final version undergoes validation against the requirements and acceptance criteria. Functional testing, usability evaluation and security checks are documented. The findings are then used to prepare the final project report and recommendations for implementation.

A prototype is not automatically a finished, production-ready system. If SESIQ is intended to handle actual counselling records, deployment should only proceed after the institution has approved the necessary security, privacy and operational safeguards.

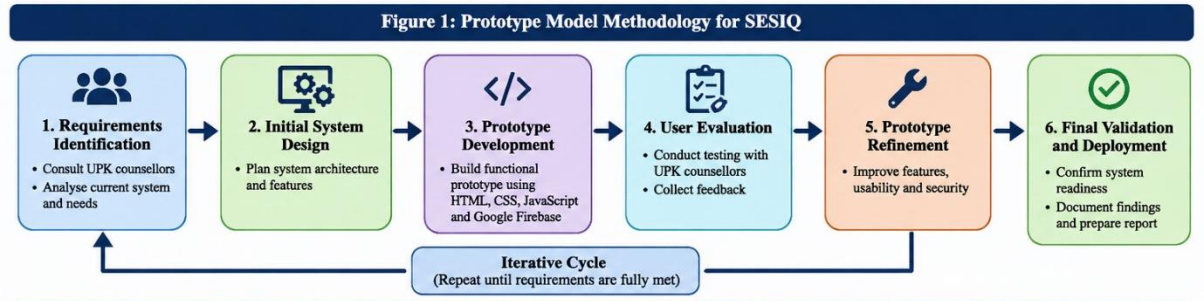


Table 1: 12-Week Project Schedule (Gantt Chart)

No.	Development Activity	W1-2	W3-4	W5-7	W8	W9	W10	W11	W12
1.	Requirements Identification								
2.	Initial System Design								
3.	Prototype Development								
4.	Functional Testing and UPK Evaluation								
5.	Prototype Refinement								
6.	Second Evaluation and Security Testing								
7.	Final Validation								
8.	Documentation and Report Preparation								

Methodology Explanation

The SESIQ project adopts the **Prototype Model**, an iterative approach that allows continuous improvement based on user feedback. The development process begins with the identification of UPK's requirements, followed by initial design, prototype development, and evaluation. Feedback from counsellors is used to refine the system, ensuring the final product meets functional, usability and security standards. This approach enables a flexible and user-centred development process for a reliable digital counselling management system.

Evaluation Procedure

Evaluation is conducted in two phases:

1. **Formative Evaluation** – During the development stage, UPK counsellors test the prototype and provide feedback on usability, features and data accuracy.
2. **Summative Evaluation** – After refinement, the final system is validated for performance, security and compliance with institutional requirements. The results are analysed and used for further improvements.

Confidentiality and Security Considerations

Given the sensitivity of counselling records, strict security measures are implemented throughout the methodology:

- Role-based access control for authorised users only
- Secure data storage via Google Firebase
- Data encryption during transmission
- Compliance with data protection and institutional policies

These measures ensure the confidentiality, integrity and availability of counselling information in SESIQ.

Figure 1. Prototype Model

3.2 Proposed Project Schedule for SESIQ Development

The schedule above allocates 12 weeks to the project. It is a proposed timeline that can be adjusted to match the actual start date, development progress and availability of UPK counsellors. The proposed schedule provides three important advantages.

1. Structured development: The project progresses through identifiable stages, making it easier to monitor activities and deliverables.
2. User-centred improvement: Time is allocated for UPK counsellors to evaluate the prototype and for developers to address their feedback.
3. Documented validation: The final weeks are reserved for checking the system against its requirements and documenting the results.

4. RESEARCH AND DEVELOPMENT METHODOLOGY

4.1 Prototype Model

The development of the Efficient Counselling Session and Information System (SESIQ) adopts the Prototype Model as its software development methodology. This approach was selected as it supports iterative development, continuous user involvement and systematic refinement based on feedback. The methodology is suitable for SESIQ since the system is designed to address practical challenges in counselling record management at the Psychology and Counselling Unit (UPK), Kolej Vokasional Pasir Mas.

The development process begins with requirements identification to determine the operational needs of UPK counsellors and the limitations of existing record-management practices. The requirements are subsequently translated into an initial system design, which defines the interface structure, navigation, database organisation and essential system functions. The prototype is then developed using HTML5, CSS3 and JavaScript for the frontend, while Google Firebase supports user authentication and digital data storage.

Following the development stage, the prototype is evaluated by the intended users to assess its functionality, usability, data accuracy and suitability for counselling management activities. Feedback obtained during this evaluation is analysed to identify deficiencies and determine the necessary modifications. The prototype is subsequently refined and subjected to further testing where required. This iterative process enables the development team to improve the system progressively in accordance with the identified requirements.

The final stage involves validating the revised system against predefined acceptance criteria and documenting the development and evaluation outcomes. Particular attention is given to confidentiality, data integrity and access control because SESIQ manages sensitive counselling information. Overall, the Prototype Model provides a structured yet flexible approach to developing a user-oriented digital counselling management system that responds to the operational needs of UPK.

4.2 Justification for Selecting the Prototype Model

The Prototype Model was selected to such an extent it allows intended users to participate in system development before the final version is established. In the context of SESIQ, the requirements of counselling personnel may involve specific workflows, information categories, reporting needs and access restrictions that are difficult to define completely at the beginning of development.

Through iterative prototyping, UPK counsellors can evaluate the proposed functions and provide feedback on the suitability of the system. This enables developers to identify usability problems, functional limitations and unmet requirements at an earlier stage. Consequently, the development process can reduce the risk of producing a system that does not adequately support actual counselling management practices.

Furthermore, the Prototype Model supports progressive improvements in interface design, data handling and system functionality. Nevertheless, its effectiveness depends on clear requirements, documented feedback, controlled revisions and systematic testing. Therefore, each development cycle should be recorded to demonstrate how user evaluation contributes to the improvement of SESIQ.

5. EVALUATION OF THE SESIQ PROTOTYPE

User evaluation is an essential component of the Prototype Model because it determines whether the system meets the operational requirements of its intended users. For SESIQ, the evaluation involves UPK counsellors who are familiar with the existing counselling management processes. The evaluation should be conducted in two phases.

5.1 Phase 1: Formative Evaluation

Formative evaluation is conducted during prototype development to identify problems and guide improvements. The counsellors can be asked to perform selected tasks, such as:

- Logging into the system using their authorised accounts.
- Creating and retrieving counselling records using test data.
- Updating records according to their assigned permissions.
- Accessing relevant information and generating reports, where supported.
- Navigating the interface and identifying difficulties.

The developers record the results and collect feedback to determine which functions require improvement.

5.2 Phase 2: Summative Evaluation

Summative evaluation is conducted after the prototype has been refined. Its purpose is to assess the extent to which the system satisfies the predefined requirements. The evaluation may consider the following criteria:

No.	Evaluation criterion	Suggested measurement
1	Functionality	Percentage of test cases passed
2	Usability	User ratings on ease of use and navigation
3	Data accuracy	Number of discrepancies identified during testing
4	Efficiency	Time required to complete selected tasks
5	Reliability	Frequency of errors during repeated testing
6	Access control	Results of tests involving authorised and unauthorized access
7	User satisfaction	Overall ratings and qualitative feedback

These criteria provide a basis for evaluating the prototype systematically.

6. DISCUSSION

6.1 Addressing Challenges in Conventional Counselling Record Management

The development of SESIQ was initiated to address challenges associated with conventional and decentralised counselling record management at the Psychology and Counselling Unit (UPK), Kolej Vokasional Pasir Mas. When records are maintained through separate files or inconsistent recording practices, retrieving information, maintaining record consistency and preparing reports may require additional time and effort. These challenges highlight the need for a more systematic approach to managing counselling information.

SESIQ proposes a centralised digital platform through which authorised users can manage counselling records in a more organised manner. By bringing the relevant information into a structured system, the innovation aims to reduce dependence on fragmented record-keeping practices and facilitate information retrieval. This approach may also improve consistency in record management by providing a common structure for recording and organising information.

However, the extent to which SESIQ improves the existing process should be established through testing and comparison with the previous method. For example, the time required to retrieve a record before and after using SESIQ could be measured to determine whether the system offers a measurable improvement in operational efficiency.

6.2 Improvement in Operational Efficiency and Information Management

One of the main contributions of SESIQ is its potential to improve the efficiency of counselling information management. The system is designed to organise counselling records digitally, allowing authorised counsellors to retrieve and manage information through a structured interface.

The use of HTML5, CSS3 and JavaScript supports the development of an interactive user interface, while Google Firebase provides authentication and data-storage capabilities. These technologies enable the development of a web-based system without requiring a fully custom-built server infrastructure. Nevertheless, the overall effectiveness of the system depends on how well its functions are implemented, integrated and tested.

From an operational perspective, SESIQ may reduce repetitive administrative work, improve the organisation of counselling records and facilitate the preparation of information required for administrative purposes. A structured digital database may also help reduce inconsistencies associated with manual recording, provided that appropriate validation mechanisms are implemented.

To substantiate these potential benefits, the evaluation should examine task-completion time, record-retrieval accuracy, data-entry errors and user feedback. The findings would provide a stronger basis for determining whether SESIQ offers practical improvements over the existing process.

6.3 User-Centred Development Through the Prototype Model

The adoption of the Prototype Model is an important aspect of SESIQ development because it enables the system to be refined according to the needs of its intended users. Rather than relying entirely on the developers' assumptions, the methodology provides opportunities for UPK counsellors to evaluate the prototype and identify areas requiring improvement.

During the evaluation process, counsellors can assess the interface, navigation, record-management functions and suitability of the system for their daily responsibilities. Feedback obtained from these activities can then guide modifications to the system's design and functionality. Previous research has highlighted the importance of system design elements, including information searchability, data-entry processes and workflow alignment, in determining the usability of electronic information systems (Cahill et al., 2025). Nevertheless, the effectiveness of this approach depends on whether user feedback is collected systematically and translated into documented improvements. Evidence such as evaluation scores, identified usability issues and records of modifications would strengthen the discussion of the Prototype Model's contribution to SESIQ development.

6.4 Contribution to Digital Transformation in Educational Institutions

SESIQ represents an effort to apply digital technology to an administrative function within a vocational education institution. While digital transformation is often associated with teaching and learning, administrative processes also benefit from appropriate technology when it improves information organisation, accessibility and operational efficiency.

The proposed system demonstrates how web technologies and cloud-based services can be applied to support counselling record management. By providing a structured digital environment, SESIQ has the potential to support more consistent administrative practices and improve the management of information required by the UPK.

Furthermore, the development of SESIQ illustrates the potential for vocational institutions to produce digital innovations that respond directly to institutional needs. Such projects can demonstrate the practical application of information technology to real administrative challenges.

However, the value of this contribution should be assessed according to the system's demonstrated usefulness, reliability and suitability for its intended users, rather than the mere adoption of digital technology.

6.5 Data Confidentiality, Security and **Access** *Control*

Confidentiality is a critical consideration in the development of SESIQ because counselling records may contain sensitive personal information. Unlike general administrative systems, counselling management systems require particular attention to the protection of information and the restriction of access to authorised personnel. The use of digital technologies in mental healthcare, including electronic records and cloud-based storage, introduces privacy risks that require appropriate safeguards to prevent unintended breaches of client confidentiality (Lustgarten et al., 2020). The integration of Google Firebase for authentication and data storage provides a technical foundation for implementing user authentication and database access controls. However, authentication alone does not guarantee the confidentiality of stored information. Appropriate database security rules, role-based permissions and secure data transmission must also be implemented and tested.

In the context of UPK, access permissions should reflect the responsibilities of the counsellors and the head of the unit. If counsellors are permitted to access one another's cases, the system must implement this arrangement in accordance with institutional authorisation and confidentiality requirements.

Therefore, the security evaluation should examine whether unauthorised users can access restricted records, whether users can perform only their permitted actions and whether sensitive information is adequately protected during storage and transmission.

These measures are essential in determining whether SESIQ is suitable for managing confidential counselling information. The use of a cloud database should not, by itself, be presented as proof that the system is secure. Security must be demonstrated through appropriate configuration, testing and institutional approval.

6.6 Limitations of the Innovation

Despite its potential benefits, several limitations should be considered when evaluating SESIQ. First, the effectiveness of the system depends on the completeness of its implemented functions and the quality of its evaluation. A functional prototype may demonstrate the feasibility of digital counselling

management, but it does not automatically establish that the system is more efficient than existing practices.

Second, the system's usability and practical suitability depend on feedback from its intended users. If evaluation involves only a small number of counsellors, the findings may provide useful initial insights but may not represent the needs of all potential users.

Third, the use of cloud-based data storage introduces operational considerations, including internet connectivity, database availability, access permissions and data recovery. Appropriate procedures must be established to minimise disruption and protect information.

Finally, the system requires ongoing maintenance to address technical problems, improve functionality and accommodate changing institutional requirements. These limitations suggest that SESIQ should initially be evaluated as a prototype and refined according to documented findings. Further testing and institutional assessment would be necessary before the system could be recommended for wider operational use.

6.7 Potential for Future Development

SESIQ has potential for further development to support more comprehensive counselling management activities. Future enhancements could include automated report generation, appointment scheduling, dashboard summaries and notifications for relevant administrative activities. These features could reduce repetitive administrative tasks and provide counsellors with a more organised overview of their work.

The system could also be improved through more detailed access-control mechanisms, audit logs and documented backup and recovery procedures. These enhancements would strengthen accountability and support the responsible management of confidential information.

In addition, future evaluation could involve a larger group of intended users and compare the performance of SESIQ with the existing record-management process. Quantitative measurements, including task-completion time, retrieval accuracy and error frequency, could provide objective evidence of the system's effectiveness.

Nevertheless, future development should be guided by actual user requirements, institutional priorities and data-protection considerations. Additional features should only be introduced when they provide demonstrable value and can be implemented without compromising the confidentiality of counselling records.

7. CONCLUSION

The development of SESIQ using the Prototype Model provides a systematic and user-centred approach to improving counselling record management at Kolej Vokasional Pasir Mas. The methodology integrates requirements identification, initial system design, prototype development, user evaluation, iterative refinement and final validation.

The proposed 12-week Gantt chart provides a structured schedule for managing development activities and monitoring project progress. In addition, the involvement of UPK counsellors allows the system to be evaluated against actual operational needs, while documented testing provides evidence of its functionality and usability.

Nevertheless, the success of SESIQ should not be determined solely by the completion of its technical features. Its suitability for practical implementation also depends on reliable data handling, appropriate access permissions, confidentiality safeguards and satisfactory user evaluation results. By integrating these considerations into the development process, SESIQ can establish a stronger foundation for a systematic, efficient and responsible digital counselling management system.

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