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Web-Based Information System for International Competition Registration

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ABSTRACT

The management of international student competitions in higher education institutions often faces challenges related to fragmented registration processes, manual data handling, and inefficient submission management. These issues may lead to data inconsistency, administrative errors, and limited transparency for participants. This research aims to design and implement a web-based information system that integrates competition registration and work submission into a single platform. The study adopts a system development-oriented approach, including requirement analysis, system design, implementation, and functional testing. The proposed system supports an integrated registration and submission process for participants, role-based access for administrators, administrative verification, and real-time status monitoring. The implementation results indicate that the system operates according to functional requirements and improves administrative efficiency, data accuracy, and accessibility for users. By centralizing registration and submission processes, the system reduces redundancy and simplifies competition management workflows. This research provides a practical solution for managing international student competitions, with a case implementation at Universitas Pancasakti Tegal.

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1. INTRODUCTION

The rapid advancement of information technology has significantly transformed the way higher education institutions manage academic and non-academic activities. Information systems are widely adopted to improve efficiency, data accuracy, and service quality within universities, including the management of academic events and student activities [1], [2]. One of the growing needs in universities is the efficient management of international student competitions, which often involve complex registration processes, document verification, and submission of creative or scientific works. In many cases, competition registration is still handled manually or semi-digitally through email and fragmented online forms, leading to data redundancy, administrative errors, delayed verification, and limited transparency for participants [3]. These challenges reduce institutional efficiency and negatively affect participant experience, especially in international-scale events that require accuracy, accessibility, and real-time information [4].

Several previous studies have highlighted the role of information systems in improving registration management, event administration, and online submission platforms. Existing systems generally focus on event registration, academic conference management, or learning management systems, providing features such as

user authentication, form-based registration, and document uploads [5], [6]. However, many of these systems are not specifically designed to support international competition workflows that integrate participant registration, submission of competition works, administrative validation, and announcement management within a single platform. In addition, most related studies emphasize system functionality but provide limited discussion on adaptability for institutional competition programs and scalability for international participants [7].

Based on these conditions, this research proposes the design and development of a web-based information system that integrates international competition registration with direct submission of participant works. The system is designed to support organizers in managing participant data, submission files, verification processes, and competition information in a structured and centralized manner. The novelty of this research lies in the integration of registration and work submission features tailored to international student competitions, combined with role-based access for participants and administrators [8], [9]. This study aims to produce an effective and user-friendly information system that can improve administrative efficiency, data accuracy, and participant accessibility, with a case implementation at Universitas Pancasakti Tegal.

2. METHOD

This research applies a system development-oriented approach focusing on the design and implementation of a web-based information system for international competition registration and work submission. This approach is commonly used in applied information systems research where the main outcome is a functional system artifact [10], [11]. The method is structured chronologically to ensure clarity, reproducibility, and scientific accountability, covering research design, data collection, system analysis, system design, implementation, and testing stages [12].

2.1. Research Design

This study uses a descriptive and applied research design combined with a system development approach. The research aims to analyze existing problems in competition registration management and to design a functional information system as a practical solution. The development process follows a System Development Life Cycle (SDLC) consisting of requirement analysis, system modeling, implementation, and evaluation. This approach is suitable because the research outcome is not only analytical but also produces a usable information system, as emphasized in software engineering and information systems research [11], [12].

2.2. Case Study Description

The case study is conducted at Universitas Pancasakti Tegal, focusing on the management of an international student competition program. The competition requires participants from various institutions and countries to register online, submit competition works, and receive official announcements. Previously, the registration and submission processes were handled manually using separate tools such as online forms and email, resulting in inefficient data management, difficulty in tracking submissions, and increased administrative workload. Similar challenges in event and competition management systems have been reported in previous studies, highlighting the need for integrated information systems to support complex event workflows [13], [14].

2.3. Data Collection Techniques

These data collection methods ensure that system requirements are accurate and aligned with real operational needs. Data collection is carried out using the following techniques [15]:

2.3.1 Observation

Direct observation is conducted on the existing competition registration process to identify workflow inefficiencies, data handling issues, and administrative constraints. Observation is widely used in information systems analysis to understand real operational processes and identify system improvement opportunities [15], [16].

2.3.2 Interviews

Semi-structured interviews are conducted with competition committee members and academic administrators to gather detailed requirements, system expectations, and operational challenges. This technique allows researchers to capture user needs and system expectations directly from stakeholders and is commonly applied in system requirement elicitation [16], [17].

2.3.3 Documentation Study

Supporting documents such as competition guidelines, registration forms, submission requirements, and administrative reports are analyzed to ensure system compatibility with institutional procedures. Documentation analysis helps ensure that system requirements align with formal organizational rules and workflows [15].

2.4. System Requirement Analysis

Based on the collected data, system requirements are classified into functional and non-functional requirements, following standard information systems requirement analysis practices [10], [12].

1. Functional requirements include:
 - a. User registration and authentication for participants and administrators
 - b. Online competition registration form
 - c. Upload and management of competition work submissions
 - d. Participant data validation and submission status monitoring
 - e. Administrative verification and data management
 - f. Announcement and information dissemination features
2. Non-functional requirements include:
 - a. System accessibility through web browsers
 - b. Data security and role-based access control
 - c. Usability and responsive interface design
 - d. System reliability and data integrity

2.5. System Design

The system is designed using a modular architecture to ensure scalability, maintainability, and flexibility in future development. This architectural approach allows each system component to be developed, tested, and maintained independently, thereby reducing system complexity and facilitating easier enhancements or modifications as requirements evolve [18], [19]. Modular system design is widely adopted in information systems development to support long-term system sustainability and adaptability.

System modeling is conducted using Unified Modeling Language (UML) diagrams, which are widely adopted as a standard modeling tool for visualizing system structure, functional processes, and behavioral interactions in information systems development [20]. UML modeling provides a clear and systematic representation of system requirements, enabling better communication between developers and stakeholders throughout the development process. The modeling in this study includes use case diagrams, activity diagrams, and entity relationship diagrams to represent system functionality, workflows, and data structures.

1. Use Case Diagrams to describe user interactions

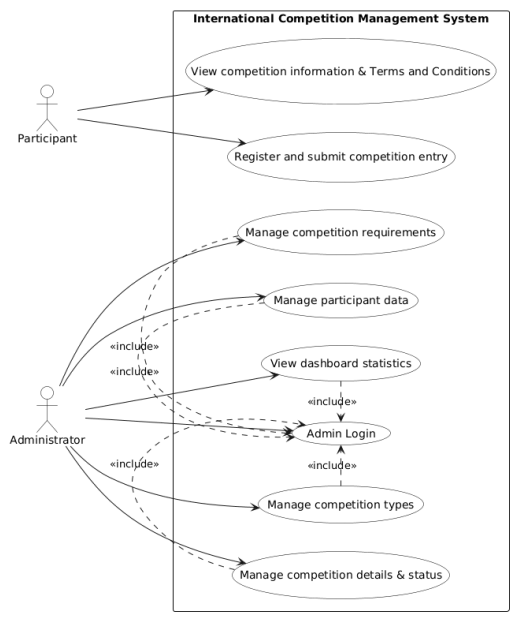


Figure 1. Use case diagram website intercamp

2. Activity Diagrams to illustrate system workflows

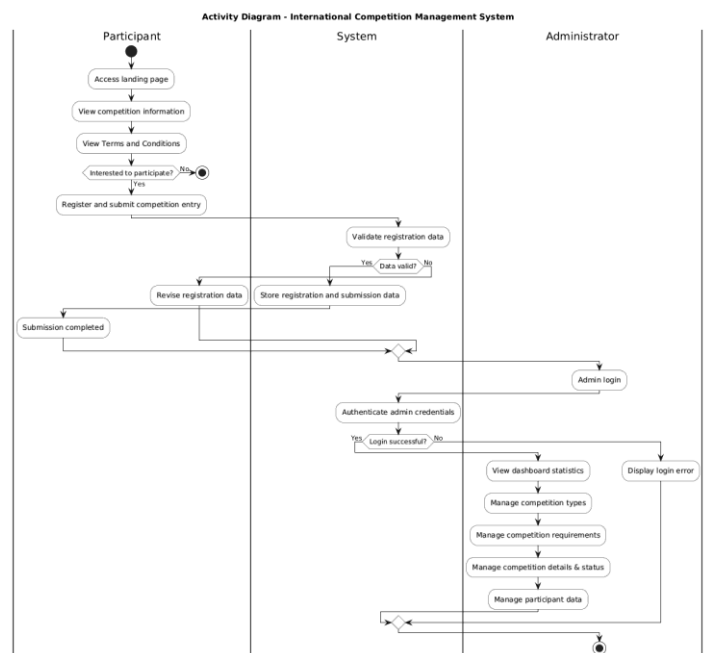


Figure 2. Activity diagram website intercamp

3. Entity Relationship Diagrams (ERD) to model database structure

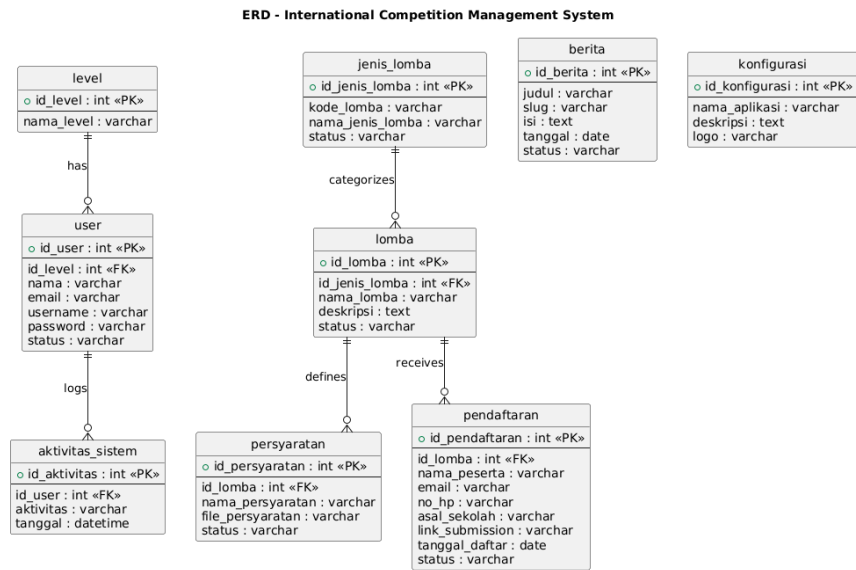


Figure 3. ERD database website intercamp

The system architecture is designed using a three-layer structure to support modularity and maintainability. The Presentation Layer provides interfaces for participants and administrators, including public information, registration, and administrative dashboards. The Application Layer handles core business logic such as authentication, registration processing, submission handling, and validation. The Data Layer manages centralized storage of user, competition, and registration data to ensure data consistency and integrity.

2.6. System Implementation

The implementation phase translates the system design into a functional web-based application. The system supports multiple user roles, including participants and administrators. Participants can view competition information and Terms and Conditions, complete an integrated registration and work submission process, and monitor submission status. Administrators can manage participant data, verify submissions, and publish competition announcements.

The system is implemented using standard web technologies to ensure compatibility and accessibility across different devices and platforms. Centralized data storage is applied to minimize data redundancy and improve data consistency, which is a fundamental principle in information system implementation and database management [18], [21].

2.7. System Testing

System testing is conducted using **functional testing techniques** to ensure that all system features operate according to predefined specifications. Each functional requirement is tested based on predefined test cases, including registration and submission processes, authentication, data validation, and administrative verification. Functional testing is widely used in software engineering to validate system behavior, ensure functional correctness, and identify potential errors before deployment [22]. The testing results are analyzed to confirm that the system is ready for operational use in managing international student competitions.

4. RESULT AND DISCUSSION

The primary result of this research is a web-based information system that integrates international competition registration and direct submission of participant works within a single platform. The system successfully supports two main user roles: participants and administrators. Participants are able to create accounts, complete online registration forms, upload required competition documents, and monitor submission status in real time. The system provides clear status indicators that inform participants whether their submissions are pending, accepted, or require revision. This feature improves transparency and reduces uncertainty during the competition process.

Administrators are provided with a centralized dashboard that allows them to manage participant data, verify submissions, and publish official announcements. The centralized data management significantly reduces data redundancy and minimizes errors commonly found in manual or semi-digital registration systems.

3.1. System Implementation Results

The implementation results demonstrate that the developed system is capable of supporting the end-to-end process of international competition management, starting from public information dissemination to participant registration and administrative data management. Each system page was evaluated based on its functionality, usability, and contribution to the overall competition workflow.

3.1.1 Landing Page

The landing page functions as the primary interface introducing the *International Student Mobility and Joint Summer Camp 2025* program. This page presents key information related to the event, including competition branding, navigation menus (home, competitions, contact, and registration), and featured competition categories such as the *Online Vlog Competition (OVC)*. The visual layout and structured navigation facilitate easy access to information for international visitors and serve as an effective entry point to the system.

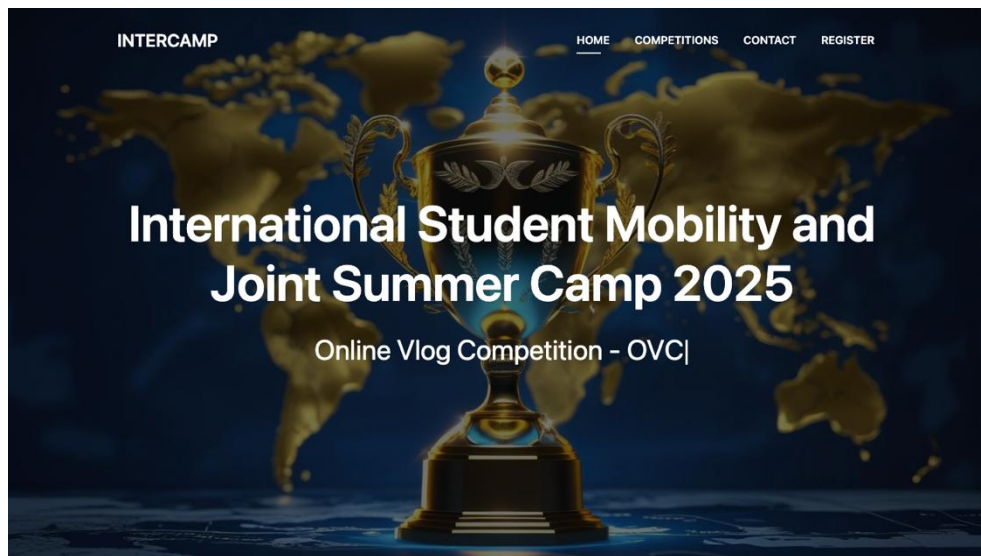


Figure 4. Landing page website intercamp

3.1.2 Login Page

The login page provides a secure authentication mechanism for administrators to access the back-end system. Authorized users are required to enter valid credentials before being granted access. This page ensures system security by restricting administrative features only to authenticated users, thereby protecting sensitive participant data and competition management functions.

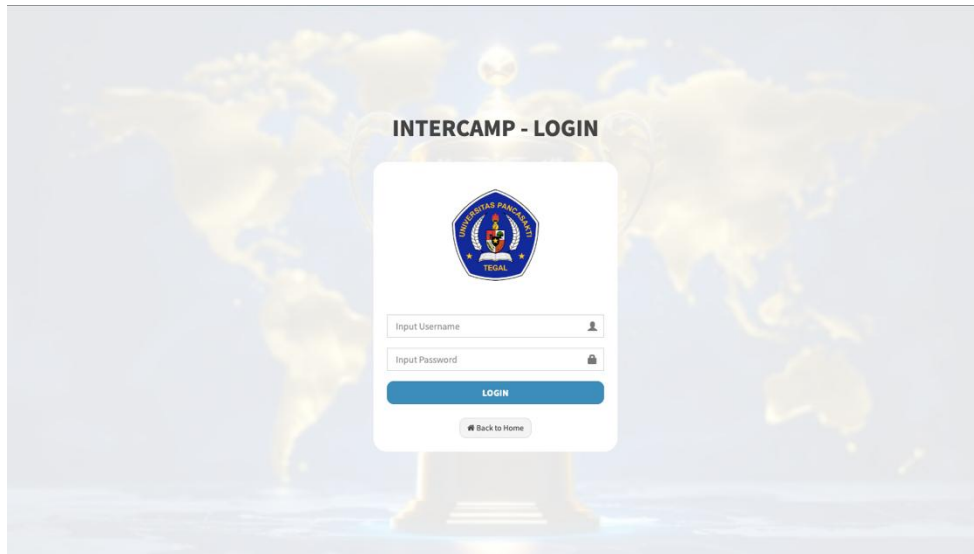


Figure 5. Login website intercamp

3.1.3 Dashboard

The dashboard page acts as an administrative overview panel that displays real-time competition statistics. This page presents summarized data such as the total number of registered participants for each competition category. By providing instant insights into participant distribution, the dashboard supports administrators in monitoring registration progress and making informed decisions during the competition period.

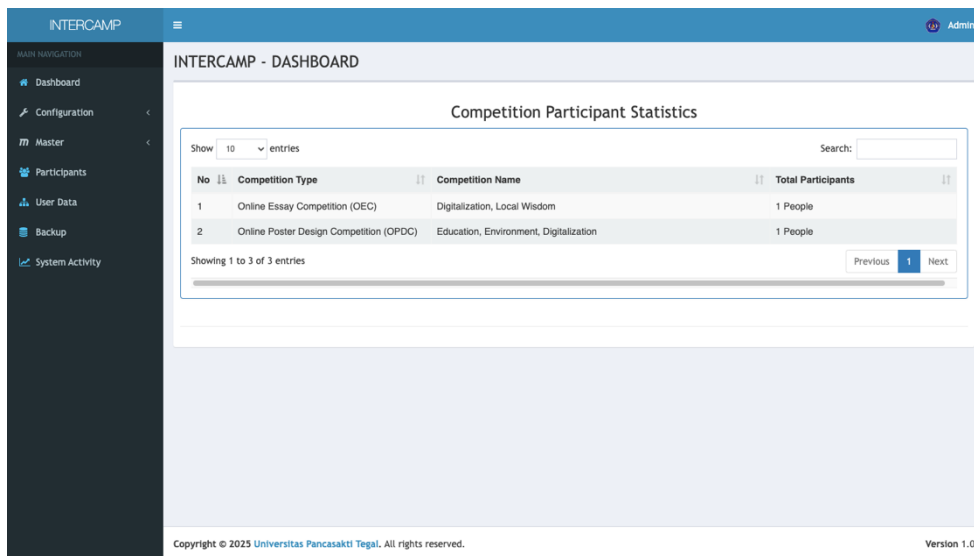


Figure 6. Dashboard website intercamp

3.1.4 Data Type Competition

The *Data Type Competition* page is used to manage competition categories within the system. Administrators can define competition types along with their corresponding codes and abbreviations, such as *OEC* for *Online Essay Competition* and *OVC* for *Online Vlog Competition*. The availability status of each competition type can also be managed through this page, ensuring structured categorization and consistency across the system.

No	Competition Type Code	Competition Type Name	Abbreviation	Status
1	7	Online Essay Competition	OEC	Active
2	8	Online Photography Contest	OPC	Active
3	9	Online Poster Design Competition	OPDC	Active
4	10	Online Vlog Competition	OVC	Active
5	11	Online Solo Vocal	OSV	Active
6	12	Online Business Plan Competition	OBPC	Active

Figure 7. Data type competition website intercamp

3.1.5 Data Competition

The *Data Competition* page provides detailed management of individual competitions under each competition type. This page displays information such as competition names, assigned codes, competition status (active), and specific themes or categories. Through this interface, administrators can control which competitions are available for registration and manage competition details in an organized manner.

No	Competition Type Name	Competition Code	Competition Name	Status
1	Online Essay Competition (OEC)	69	Digitalization, Local Wisdom	Active
2	Online Photography Contest (OPC)	71	Nature, Culinary, Culture	Active
3	Online Poster Design Competition (OPDC)	74	Education, Environment, Digitalization	Active
4	Online Vlog Competition (OVC)	77	OVC	Active
5	Online Solo Vocal (OSV)	78	OSV	Active
6	Online Business Plan Competition (OBPC)	79	Canvas, Video Pitching Category	Active

Figure 8. Data competition website intercamp

3.1.6 List Competition Requirement - Admin

This internal administrative page allows organizers to manage the primary requirements for each competition category. Administrators can define requirement details, manage submission status, and ensure that all necessary criteria are properly configured before participant registration begins. This feature supports standardized competition rules and improves internal administrative control.

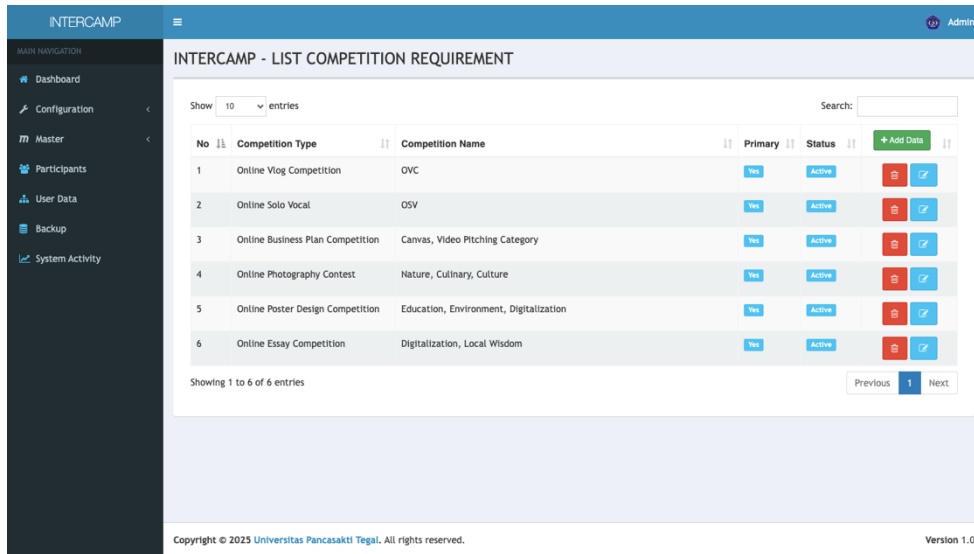


Figure 9. List competition requirement website intercamp

3.1.7 List Competition Requirement - Public

The public-facing competition requirement page provides transparent access to competition requirements for prospective participants. This page displays important information such as submission deadlines and enables participants to download official *Terms and Conditions (T&C)* documents for each competition. By making requirements publicly accessible, the system reduces information asymmetry and improves participant preparedness prior to registration.

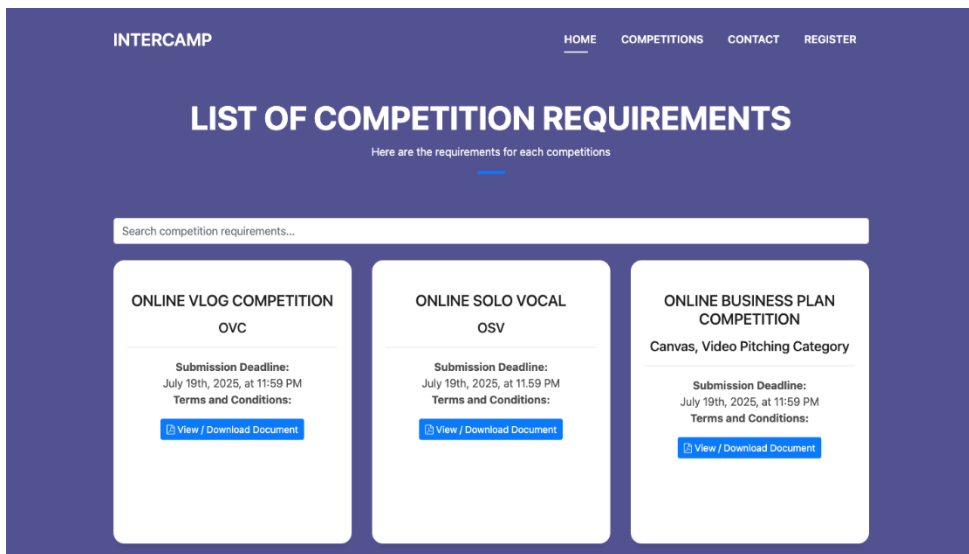


Figure 10. List of competition website intercamp

3.1.8 Form Registration

The registration form page enables participants to submit their competition applications online. Participants are required to input personal information, institutional affiliation, email address, WhatsApp contact number, and links to their submitted works. Input validation is applied to ensure data completeness and accuracy before submission. This page serves as the core interface for participant onboarding into the competition system.

The screenshot shows a web form titled "FORM REGISTRATION" on the INTERCAMP website. The form is enclosed in a dark border and contains the following fields:

- COMPETITION TYPE: A dropdown menu with "-Select-" selected.
- COMPETITION NAME: A dropdown menu with "-Select-" selected.
- SCHOOL NAME: A text input field with the placeholder "Enter school name".
- FULL NAME: A text input field with the placeholder "Enter full name".
- LINK SUBMISSION: A text input field with the placeholder "Enter your link submission".
- PLACE OF BIRTH: A text input field with the placeholder "Enter place of birth".
- DATE OF BIRTH: A text input field with the placeholder "Enter date of birth".
- EMAIL: A text input field with the placeholder "Enter a valid email address".
- WHATSAPP / PHONE NUMBER: A text input field with the placeholder "Enter WhatsApp number" and a red warning message: "Use the prefix 62. Example: 62812345678".

Figure 11. Form registration student website intercamp

3.1.9 Data Competition Participants

The *Data Competition Participants* page functions as a centralized administrative database that stores detailed participant records. This page displays information such as registration dates, contact details, competition categories, school or university origins, and submission links. Administrators can efficiently monitor, verify, and manage participant data through this interface, which is particularly essential for handling international-scale competitions involving numerous participants.

The screenshot shows the "INTERCAMP - DATA COMPETITION PARTICIPANTS" page. It features a sidebar with navigation options: Dashboard, Configuration, Master, Participants, User Data, Backup, and System Activity. The main content area includes a search bar and a table of participants.

No	Registration Date	WA	Phone Number	Competition Type	Competition Name	Full Name	Email	School Name	Link Submission	Form	Action
1	15-07-2025 09:05		62877xxxxxxx	Online Poster Design Competition	Education, Environment, Digitalization	Austin	austin@gmail.com	Harvard University	%Link	%Link	
2	15-07-2025 09:09		62877xxxxxxx	Online Essay Competition	Digitalization, Local Wisdom	Max	max@gmail.com	Hogwart University	%Link	%Link	

Showing 1 to 2 of 2 entries. Previous 1 Next

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Figure 12. Data competition participants website intercamp

3.2. Functional Testing Results

Functional testing was conducted to evaluate whether each system feature operates according to predefined functional requirements. This testing focuses on verifying the correctness of system behavior from the user's perspective and ensuring that all core functionalities support the international competition management workflow as intended. Each function was tested using predefined test cases derived from system requirements identified in the analysis phase. Table 2 presents a summary of the functional testing results for the main system features.

Table 1. Functional Testing Results

No	System Function	Expected Result	Test Result
1	User registration and login	Users can register accounts and access the system successfully	Passed
2	Competition registration form	Participant data saved correctly in the database	Passed
3	Work submission upload	Competition files uploaded and stored securely	Passed
4	Submission status monitoring	Submission status displayed accurately to participants	Passed
5	Administrative verification	Administrators can validate and update submission status	Passed
6	Announcement management	Competition information displayed to participants	Passed

3.3. Discussion

The implementation results indicate that the developed information system successfully integrates public information delivery, participant registration, submission management, and administrative monitoring within a single platform. Compared to manual or semi-digital approaches, the system improves data consistency, reduces administrative workload, and enhances transparency for participants. The modular structure and role-based access ensure that the system can be maintained and expanded for future competition programs. These findings confirm that the system effectively addresses the operational challenges identified in the earlier stages of this research.

5. CONCLUSION

This research has successfully designed and implemented a web-based information system for international competition registration and management. The system integrates public information dissemination, participant registration, competition requirement access, work submission, administrative verification, and participant data management within a single platform. Based on the implementation results, the system effectively supports the end-to-end workflow of international student competitions, from initial information access to administrative monitoring.

The functional testing results demonstrate that all core system features operate according to predefined requirements. User registration and authentication, competition registration, work submission, submission status monitoring, administrative verification, and announcement management functions were all verified successfully. These results indicate that the system is functionally reliable and capable of improving administrative efficiency, data accuracy, and transparency for both organizers and participants.

The main contribution of this study lies in the practical implementation of an integrated competition management system tailored to international student programs. By centralizing competition data and automating key administrative processes, the system reduces manual workload and minimizes data inconsistency commonly found in conventional registration methods. Furthermore, the role-based access mechanism enhances system security and supports controlled data management.

Despite the positive outcomes, this research has certain limitations. The system evaluation was limited to functional testing and did not include comprehensive usability testing or performance evaluation under high user loads. Future research is recommended to incorporate user experience evaluation, system scalability testing, and the integration of advanced features such as automated assessment or analytics to further enhance system effectiveness and sustainability.

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