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6th International Innovation & Design in Library & Information Science Competition (InDeLib2023)

MAPPING THE **LIBRARY** OF **TOMORROW** THROUGH INNOVATION

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Dewan Perdana,
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PREFACE

The first International Innovation & Design in Library & Information Science Competition (InDeLib) was held in 2016 at the international level. InDeLiB became a brand name linked to the Faculty of Information Management, UiTM Kedah Branch, known to many local and international learning institutions. InDeLib is open to all organizations (libraries), librarians, professionals, researchers, academicians, teachers, and students from institutes of higher learning, college, secondary and primary schools. They share their ideas or methods throughout innovation and invention, particularly in library and information science. The 6th InDeLib 2023 is endorsed by the Librarians Association of Malaysia and the National Library of Malaysia.

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ENHANCING LIBRARY SERVICES VIA TECHNOLOGY: IN-HOUSE DEVELOPMENT OF AN ONLINE LIBRARY BOOKING SYSTEM

Hasniza Amno[1], Nurulhuda Abdul Jais[2], Ida Shazrina Ismail[3], Muhamad Amin Azmi[4], and Md Naim Salis@Saleh[5]

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Abstract
The Library Tech Tool Online Booking (LTTOB) is an online library booking system for equipment, tools, or devices available at the IPPT Library for all Universiti Sains Malaysia (USM) members. The primary function of this system is to allow library users to make reservations and facilitate staff in managing those bookings. Access to the LTTOB system is granted through the "Identiti@USM" login. LTTOB streamlines the user booking process, starting from the application, checking the reservation status, and concluding with the completion of the booking. Equipped with availability schedules, locations, and space statuses displayed on the main menu, it simplifies user decision-making. A green indicator signifies available spaces and devices, while pink indicates a space has been filled or reserved. This user-centric LTTOB system is user-friendly and easily managed by library staff. The system's features allow each device and tool to be set according to different time slots and locations. Staff can make adjustments, amendments, or temporary blocks to the slots and dates indicated in the provided schedule grid. Booking statistics can be generated through the LTTOB system for analysis reports and monitoring purposes. In essence, this system's development streamlines processes for staff and users. The LTTOB system is a user-friendly application that aids in monitoring services and is easy to use. It greatly assists the library in providing a customer-friendly experience while facilitating effective service monitoring.

Keywords
Online Booking System, Library Tech Tool, Reservations Management

Novelty & Uniqueness
The Online Library Booking System's novelty and uniqueness lie in its groundbreaking approach to enhancing user convenience and administrative efficiency. Unlike traditional library systems, this platform integrates modern technology and user-centric features to create a seamless reservation experience.

1. User-Centric Design: The system's emphasis on user convenience sets it apart. Its intuitive interface enables users to easily browse and select equipment, tools, or devices, while the real-time availability indicators (green for available, pink for reserved) enhance decision-making.
2. Integrated Authentication: The system employs the "Identiti@USM" login, streamlining access for university members and enhancing the system's security.
3. Customizable Reservations: The system's uniqueness lies in its flexibility. Each tool or device can be tailored to specific time slots and locations, empowering administrators to optimize resource allocation.
4. Real-Time Updates: The dynamic availability indicators provide real-time updates, enabling users to make informed decisions promptly. This real-time feature ensures accuracy and reduces frustration caused by outdated information.
5. Statistical Insights: The system's ability to generate booking statistics offers administrators valuable insights. This analytical approach aids in strategic planning, resource management, and service optimization.
6. Centralized Management: Library staff benefit from a centralized administrative hub. They can make adjustments, amendments, or temporary booking blocks, facilitating smooth operations.

The Online Library Booking System's novelty and uniqueness stem from its blend of cutting-edge technology, user-centricity, flexibility, and comprehensive administrative tools. This combination elevates the user experience, transforms library resource management, and positions the institution at the forefront of modern library services.

Potential Commercialization

The potential commercialization of this innovative Online Library Booking System opens up exciting avenues for both revenue generation and market expansion. By offering this system as a product or service to other educational institutions, libraries, and organizations, several opportunities for monetization and growth emerge.

1. Licensing and Subscription Model: The system can be offered to other universities, colleges, or libraries through a licensing or subscription model. Institutions can pay a fee to access and utilize the platform, allowing them to streamline their equipment reservation processes.
2. Customization and Integration Services: The system's flexibility allows for customization to suit the unique needs of different organizations. Customization and integration services for specific requirements can be a lucrative revenue stream.
3. Maintenance and Support: Providing ongoing technical support, updates, and maintenance services can be packaged as a premium offering. Institutions often seek reliable support for smooth system operation.
4. Training and Consultation: Developing training programs and offering consultation services to optimize the system's usage can create additional revenue streams.
5. Partnerships and Collaborations: Collaborating with industry events, conferences, or associations can increase visibility and credibility. These partnerships can attract potential clients and establish the system as a leader in its niche.
6. Research and Development: Feedback from clients can drive continuous improvements and updates. Investing in research and development based on market demands can enhance the system's features and maintain a competitive edge.

In conclusion, the Online Library Booking System's commercialization potential rests on its innovative features, adaptability, and user-friendly design. By strategically pricing and packaging the system's offerings and services, the institution can leverage its technology to enhance library services and create a sustainable revenue stream, furthering its financial growth and industry influence.

Acknowledgement

We extend our heartfelt gratitude to the AMDI Director, Chief Librarian, lecturers, library staff, and IT team for their instrumental roles in creating the innovative Online Library Booking System. Your collaborative efforts and expertise have revolutionized our library operations, enhancing user experiences. The visionary leadership of the Director and Chief Librarian, insights from lecturers, meticulous work of library staff, and technical excellence of the IT team have collectively shaped this transformative solution. Your contributions have elevated our institution, setting new standards in resource management and user-centric services. Thank you for your invaluable dedication and commitment to this achievement.

DATA-CENTRIC IoT SYSTEM USING ARDUINO UNO AND SMARTPHONE APP FOR WATER QUALITY PURPOSE

Muhammad Irrfan Md Fauzee[1], Wardina Balqis Zulkifli[2], Izzah Maisarah Man[3], Nor Ashikin Marzuki[4] and Dr Rossitah Selamat[5]

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Abstract

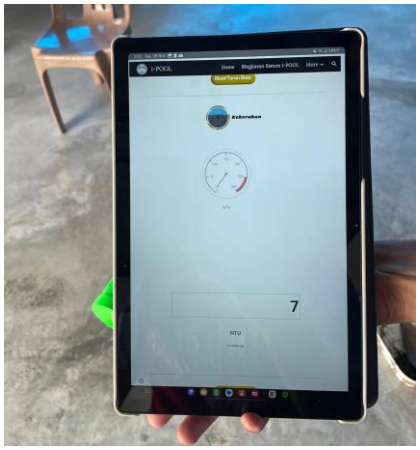
Malaysia's strategic position and rich natural resources include a rapidly growing aquaculture sector. The problem of pollution in freshwater quality is not a foreign matter nowadays because it is often associated with rapid urbanization and economic activity. Effective water quality management is crucial in preventing livestock losses. To address this, a portable IoT water quality monitoring system (i-POOL) was designed, focusing on dissolved oxygen, turbidity, temperature, and pH. Tested in various freshwater locations, including Terat Batu Lobster Pond, Land Fisherman Cooperative of Sidam Kanan District, and river, i-POOL enables real-time monitoring through a smartphone app. Feedback from the Department of Fisheries and local communities indicates positive perceptions, highlighting i-POOL's potential as a valuable tool for early water quality assessment. Thus, i-POOL clearly shows that it can have excellent prospects and be used for river and freshwater quality monitoring by providing real-time data to users.

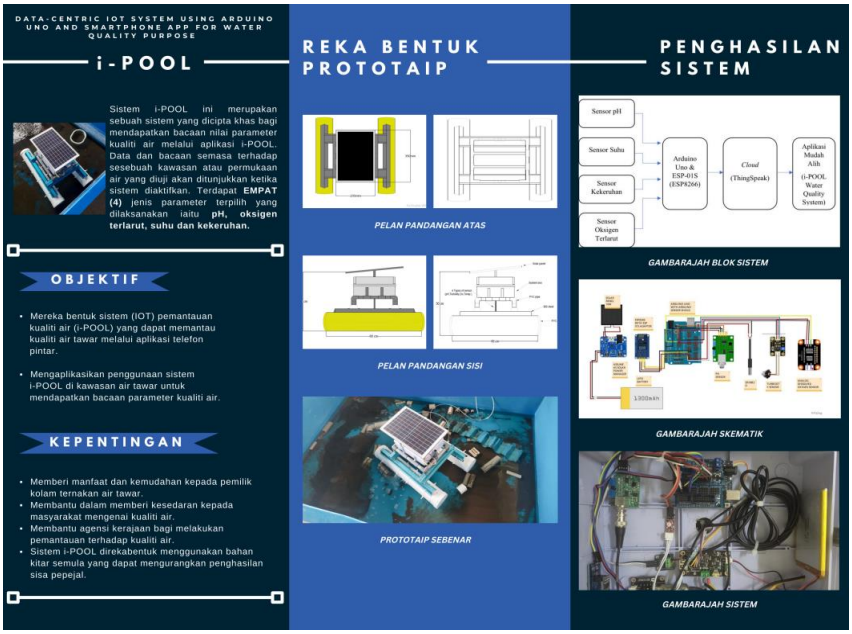
Keywords

Water Quality Monitoring, Internet of Things, Aquaculture, IR 4.0, Sustainable Development Goal, Green Technology

Product Description

Introducing a data-centric IoT system that revolutionizes water quality monitoring. Powered by an Arduino Uno as a microcontroller and an ESP-01 for Wi-Fi connectivity, this innovative solution integrates a suite of turbidity, pH, dissolved oxygen, and temperature sensors. With a rechargeable battery and solar capability, it ensures continuous operation and is environmentally friendly. Including IR 4.0 increases efficiency, making it a green technology that aligns with sustainable development goals. This intelligent system communicates seamlessly with a dedicated smartphone app, provides real-time water quality insights and can create data storage for future reference. Embracing a holistic approach advances technology and contributes to environmental sustainability. Experience advanced water quality monitoring with Arduino Uno, fostering a new era of data-driven solutions for a greener and more sustainable future.





Novelty & Uniqueness

This advanced IoT water quality monitoring system highlights its revolutionary approach to water quality monitoring., combining real-time data collection and transmission with remote access. Unlike traditional methods, it immediately addresses water quality issues, increasing its practical value for resource protection and public health. The use of advanced sensor technology throughout the system aligns with Industry 4.0, placing it at the forefront of technological evolution, thus making the system a pioneer in the industry and strengthening its potential to revolutionize water quality monitoring practices. The user-friendly interface and the interpretation of accessible data further differentiate, ensuring usability for experts and the general public. The new system represents a significant advance in water quality monitoring, promising to protect resources and contribute to real-world environmental solutions.

Benefit to Mankind

The i-POOL water quality monitoring system, developed in response to the crucial need for adequate water quality management in Malaysia's rapidly growing aquaculture sector, offers substantial benefits to humanity. Its strategic application spans various sectors, from individual households concerned about water quality to fisheries authorities safeguarding public water sources. The system ensures early contamination detection by focusing on critical parameters such as dissolved oxygen, turbidity, temperature, and pH, preventing livestock losses and financial setbacks in aquaculture projects. The portable nature of i-POOL allows for versatile use in freshwater areas, aligning with the urgent demand for solutions in regions affected by pollution from rapid urbanization and economic activities. As evidenced by positive feedback from the Department of Fisheries and local communities, i-POOL emerges as a valuable tool, enhancing public health and environmental awareness and contributing to society's overall well-being by providing real-time water quality data.

Potential Commercialization

With its focus on ease of use, affordability, and durability, this aquaculture water quality monitoring device holds solid commercial potential. It targets aquaculture farmers seeking efficient detection of important water quality indicators and is designed for a wide range of applications in freshwater livestock ponds, rivers, and lakes. Its commercial appeal extends to government agencies, businesses, and the public involved in water quality studies. By ensuring the health and quality of livestock, the device becomes an invaluable tool, offering promising opportunities for widespread use and commercial success in the aquaculture and environmental monitoring sectors.

Acknowledgement
We thank the Department of Fisheries Kulim District in Kedah for their invaluable assistance and cooperation throughout the research process. Thanks to the Sidam Kanan District Land Fisherman Cooperative and Terat Batu Crayfish Pond for facilitating business visits to their freshwater fish ponds, which, to some extent, contribute to verifying the effectiveness of our water quality monitoring system. The Intellectual Property Corporation of Malaysia (MyIPO) support in obtaining the patent certificate underscores the uniqueness and originality of our product designs. In addition, verification from the National Metrology Institute of Malaysia (NMIM) confirmed the accuracy by performing calibration tests for each sensor. We appreciate their contributions, which have played a key role in making our products different in terms of quality and utility.

Researchers Biographical Data

i. Muhammad Irrfan Md Fauzee, Wardina Balqis Zulkifli, and Izzah Maisarah Man are students in the Department of Civil Engineering at Politeknik Tuanku Sultanah Bahiyah. Their dedication to advancing engineering solutions is evident through their collaborative efforts in water quality monitoring systems.

ii. Mrs. Nor Ashikin Marzuki and Dr. Rossitah Selamat, both respected lecturers in the Department of Civil Engineering at Politeknik Tuanku Sultanah Bahiyah, bring their wealth of expertise to guide and mentor the research team. Their academic background and experience contribute significantly to the development and success of innovative projects.