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## **DEVELOPMENT OF A BLUEPRINT FOR AN INFORMATION SYSTEM TO MONITORING THE LEARNING PROCESS POST-COVID-19 PANDEMIC**

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### **Abstract**

*The COVID-19 pandemic has had a significant impact on the education sector, forcing educational institutions to adapt distance learning models. Along with these changes, the need for efficient information systems to monitor and improve the learning process becomes increasingly urgent. This research aims to develop an information system blueprint that can provide a structured solution for monitoring the learning process after the COVID-19 pandemic. This blueprint is designed to provide a comprehensive overview of the key elements required in information systems development. The choice of research methodology focuses on analyzing the needs of stakeholders, including lecturers, students and academic administration, to ensure that this system can meet the expectations and needs of all relevant parties. Emphasis is also placed on the integration of the latest technology and the use of easily accessible digital platforms. In developing this blueprint, various aspects are explained, including the system architecture, modules to be implemented, and performance measurement methods. This system is designed to support collecting learning data, tracking student participation, and providing performance analysis that can be used as a basis for decision making to improve learning effectiveness. Through this approach, it is hoped that the development of a blueprint for an information system for monitoring the learning process after the COVID-19 pandemic can make a positive contribution to the learning experience, support the flexibility of learning models, and improve the overall quality of education. . The implementation of this blueprint is expected to provide a strong foundation for further information system development and support rapid adaptation to changing learning conditions in the future.*

**Keywords:** *Blueprint, Covid-19 Pandemic, Learning Effectiveness, Information System*

### **INTRODUCTION**

The COVID-19 pandemic has been a significant turning point in the history of education, forcing educational institutions around the world to face major challenges in maintaining the continuity of learning. The impact of this pandemic is not only limited to public health aspects, but also changes the learning paradigm by encouraging the implementation of distance learning models. Even though online learning is a temporary solution, the challenges faced by educational institutions in managing and monitoring the learning process remain high (Cahyaningrum, 2023b). Effective multidisciplinary collaboration models leverage learning during the early phases of the pandemic to overcome the unique logistical challenges posed by pandemic conditions. Collaboration between physicians and researchers across disciplines will provide insight into survival that can determine the treatment of acute illnesses and chronic complications (Lutchmansingh et al., 2021).

Given that COVID-19 shut down several key services such as aviation, food services, supply chains, and export and import markets, there is a major lack of critical information to inform

prioritization for companies as this uncertainty will likely negatively impact the recovery. Internet and Communications technologies, blockchain in the food supply chain and other applications of Industry 4.0, as well as approaches that redefine the way we consume food are the innovations with the highest potential in the new era (Galanakis et al., 2021). In this case, developing an information system blueprint is an urgent need to optimize and monitor the learning process after the COVID-19 pandemic. This Blueprint aims to provide a holistic and structured view of the basic framework required to achieve this goal. By understanding the changing educational landscape and the development of stakeholder needs, it is hoped that the development of this information system can provide efficient and effective solutions (Cahyaningrum et al., 2021).

New security and prevention policies resulting from COVID-19 have prompted us to reconfigure the use of certain technologies for specific purposes related to preventing the spread of this disease. In facilities management, intelligent monitoring technology integrated with building management infrastructure focuses on creating safer indoor spaces in the face of pandemic risks. The technology also shows great potential in providing new dynamics and services to increase efficiency and sustainability in facilities management (Costa et al., 2023). Changes in learning policies, interaction patterns between lecturers and students, as well as adjustments to technological developments are the main focus in developing this blueprint. The advantages of the proposed information system are its ability to provide solutions based on the latest technology, increase transparency, and provide relevant data to support better decision making (Cahyaningrum et al., 2023).

The slow process of adapting to new technology in higher education is due to the expensive procurement of IT infrastructure. Where universities are still low in allocating funds to meet hardware and software resource needs (Susanti & Putri, 2020). During the past Covid-19 pandemic, there was a lot of news on digital media about people who were no longer able to meet their daily needs due to unstable financial conditions so that the community's economy experienced a drastic decline (Ariesto et al., 2021).

In previous research, it was stated that sleepiness and boredom in the teaching room reduces the cognitive effectiveness of the brain and in other research it also ranges in a similar age range (Cahyaningrum et al., 2023). However, in both studies, data collection and regression decisions were still carried out manually. In the research entitled smart system for detecting drowsiness in the classroom, the idea of carrying out visual tracking on students has also been initiated using centralized servers and the internet of things as well as simple AI as intelligent predictions, but the paper does not clearly explain the method used to achieve this. this goal and also whether the implementation of the experiment was successful in detecting the subject or not (Udayana et al., 2022).

Disruption of educational programs and decline in academic achievement due to ongoing temporary suspension schools and the closure of schools and universities have a negative impact on the outcomes of the educational process and healthy education from generation to generation which represents the country's social capital (Munir et al., 2023). This academic setback is detrimental to the UN-sponsored sustainable development program, which will have a significant impact on developing countries economy (Ewiss, 2021). In recent years, the globalization of higher education combined with the spread of digital technologies has generated strong political and social pressure for universities to continuously innovate in their teaching and learning practices (Pérez-Sanagustín et al., 2022). The right information technology system and architecture can help logistics companies improve visibility, coordination and efficiency in managing goods expeditions (Cahyaningrum, 2023a).

There is a need for academics and practitioners to review the success of model e-learning systems in the post-COVID-19 era. Previous research results show that information quality, system quality, and service quality have a positive influence on user satisfaction and communication quality, which, in turn, has a positive impact on loyalty intentions and subsequently increases learning effectiveness. This research found several important theoretical and practical implications for the

success model of e-learning systems in the post-COVID-19 era (Wang et al., 2023). By understanding the background and challenges faced by educational institutions, the development of this blueprint aims to provide a solid framework that can be adopted by various types of educational institutions. It is hoped that the implementation of this blueprint will pave the way for improving the quality of learning, the ability to adapt to changes in the learning environment, and make a positive contribution to the student learning experience in the post-COVID-19 pandemic era.

## **METHOD**

Methods used in developing an Information System blueprint for Monitoring the Post-COVID-19 Pandemic Learning Process. Several stages of the method carried out in this research include :

1. Identify needs  
Conduct a stakeholder analysis to identify key players, including administrators, educators, and students. Gather input on their specific needs and expectations for a post-pandemic learning monitoring system. Identify challenges and pain points experienced during the transition to remote learning.
2. Analysis of the Post-Pandemic Learning Environment  
Evaluate the current post-pandemic learning environment, considering both physical and virtual aspects. Analyze changes in pedagogical approaches, technology adoption, and student engagement strategies. Assess the readiness of the institution and its stakeholders to embrace technological solutions.
3. Selection of Development Methodology  
Choose an appropriate development methodology, considering factors such as flexibility, adaptability, and stakeholder involvement. Agile methodologies may be suitable for their iterative and collaborative nature in responding to evolving requirements.
4. Analysis of Functional and Non-Functional Requirements  
Identify functional requirements, such as data collection, user authentication, and reporting capabilities. Determine non-functional requirements, including system scalability, security, and usability. Prioritize requirements based on their importance and impact on the monitoring process.
5. Information Systems Design  
Develop system architecture that aligns with identified requirements. Define modules and subsystems for data collection, analysis, and reporting. Consider integration of existing learning management systems or databases.
6. Prototype Development  
Build a monitoring system prototype to visualize key features and functions. Gather feedback from stakeholders to refine and refine the prototype. Iterate design and functionality based on user feedback.
7. Implementation of Information Systems  
Develop a full-scale monitoring system based on the final design. Ensure compatibility with existing infrastructure and perform thorough testing. Roll out the system in stages, allowing for gradual implementation and user adaptation. Document the entire development process, including requirements, design decisions, and implementation details.
8. User Training and Acceptance  
Provide training sessions for administrators, educators, and students on the use of the new system. Address any concerns or challenges during the training phase. Monitor user acceptance and collect feedback for further improvements.
9. Evaluation and Optimization

Conduct ongoing evaluations to assess the effectiveness of the monitoring system. Collect performance metrics and user feedback for continuous improvement. Implement updates and optimizations based on evaluation results. Create user guides and documentation for future reference and troubleshooting.

## **RESULTS AND DISCUSSION**

Results and discussion on the Development of an Information System Blueprint for Monitoring the Post-COVID-19 Pandemic Learning Process. A flexible and scalable system architecture has been developed, enabling integration with existing educational infrastructure. Some of the modules include the main module as a learning data recording module so that it is able to collect and store learning data in real-time. Performance Analysis Module: Provides performance analysis based on collected data. Participation Tracking Module: Monitor student participation in learning activities. User Interface: Intuitive and responsive interface to ensure good user accessibility. Integration with commonly used online learning platforms. The next stage is testing the prototype with Stakeholder Acceptance. The prototype has been tested by various stakeholders, including lecturers, students and administrators. Positive feedback regarding interface clarity and system functionality.

The initial phase of implementation is data integration by integrating data from various sources, including existing learning management systems. The use of API technology makes it easier to exchange data between platforms. System Security includes security measures that have been implemented, including data encryption and role-based access control. User Training with Effective Training. The training sessions received positive feedback from users. Instructions for using the system are well organized and can be accessed online. Initial Evaluation is Conformity to Needs. This system has proven to be in line with stakeholder needs as identified at an early stage. System Performance is system performance that meets expectations, with fast response times and good scalability. Some implementation challenges, technical obstacles were overcome by updating the infrastructure and proactive problem solving. Active stakeholder involvement helps overcome resistance to change.

Several positive impacts on learning. This system makes a positive contribution to the learning experience after the COVID-19 pandemic. Stakeholder engagement. Involvement of faculty, students, and administrators throughout the development process ensures the system meets their needs. Persist not to change. The flexible design of the blueprint allows the system to adapt quickly to changing learning conditions. Plan full implementation of the system across the institution with scale and sustainability in mind. Continuous development with constant feedback gathering will guide continuous development and improvement. The results of this development can be published to contribute to research and development in the field of post-pandemic educational technology.

With these results and discussions, it is hoped that the information system blueprint can be implemented successfully to monitor the learning process after the COVID-19 pandemic, support continuous improvement, and have a positive impact on the quality of education.

## **CONCLUSION**

Based on the results and discussion of the development of the blueprint, it shows that this system design is able to provide a solution that is strong and in accordance with stakeholder needs. This information system blueprint has succeeded in meeting the needs of stakeholders, namely lecturers, students and administrators. This user effectiveness has succeeded in increasing user understanding and skills regarding system use through an intuitive interface and system features that are easy for users to adapt. Positive contributions to the learning process by implementing the initial phase have proven that this system can make a positive contribution to the post-pandemic learning

process. By providing real-time performance analysis and student participation information, this system supports more informed decision making. Flexibility to changes in the learning environment with a flexible blueprint design allows the system to easily adapt to changing learning conditions. This is very important considering the uncertainty that is still occurring in the world of education after the pandemic. Challenges and solutions The development process faces several challenges, such as technical obstacles and resistance to change. However, with a proactive approach and active involvement of stakeholders, many challenges can be addressed effectively. The next step involves the full implementation of this system across all educational institutions with attention to scale and sustainability. Continuous evaluation and feedback from users will guide continued development. Contributing to the development of educational technology by developing this blueprint can contribute to research and development in the field of educational technology after the pandemic. By sharing findings and experiences, we can enrich our insights in an effort to create a more effective and adaptive learning environment.

## SUGGESTION

As a suggestion for future development of an information system blueprint for monitoring the learning process after the COVID-19 pandemic, we always strive to take strategic and effective steps in facing the current dynamics of education. By continuing to follow developments and adapting the design according to evolving needs, this system has the potential to provide a sustainable positive impact in improving the quality of learning in the future.

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