



INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

**“Optimizing Innovation in Knowledge, Education and Design”**

## ***EXTENDED ABSTRACT***



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*“Optimizing Innovation in Knowledge, Education and Design”*

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Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

*Professor Dr. Roshima Haji Said*  
RECTOR  
UiTM KEDAH BRANCH



## WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3<sup>rd</sup> International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

*Dr. Junaida Ismail*

Chair

3<sup>rd</sup> International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)





## IOT FLOOD MONITORING SYSTEM

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### ABSTRACT

The flood monitoring system is designed to provide real-time data and early warning capabilities for effective flood management. By utilizing a network of sensors deployed in flood-prone areas, the system continuously monitors key parameters such as water levels and rainfall intensity. The collected data is transmitted to a central monitoring platform, where advanced analytics algorithms analyze the data streams and generate alerts and warnings based on predetermined thresholds. This enables authorities to take proactive measures, issue timely evacuation notices, and allocate resources effectively. The system also incorporates visualization tools to present the data in a user-friendly manner, aiding in decision-making and post-flood analysis. Overall, the flood monitoring system enhances flood preparedness, response capabilities, and public safety, contributing to improved flood management and reduced damages.

### INTRODUCTION

The effects of floods are profound and devastating, impacting both human lives and the environment. Homes and infrastructure are submerged, leading to displacement, economic losses, and disruptions to essential services. The environment suffers from contamination, loss of biodiversity, and long-term ecological damage. In the face of these challenges, the IoT Flood Monitoring System emerges as a powerful ally. By employing a network of interconnected sensors, real-time data analysis, and predictive modelling, this system provides vital insights for flood forecasting, early warning systems, and effective emergency response planning. By mitigating the adverse effects of floods, protecting lives, and preserving ecosystems, the IoT Flood Monitoring System represents a significant step towards building resilience and safeguarding communities against the devastating consequences of flooding.

### PROBLEM STATEMENT

The problem at hand is the need for an efficient and reliable Internet of Things (IoT) flood monitoring system to enhance flood detection, early warning capabilities, and overall flood management. Existing flood monitoring systems often lack the integration of IoT technologies, which limits their real-time data collection, analysis, and dissemination capabilities. This hampers the ability to accurately monitor flood conditions, issue timely warnings to at-risk communities, and coordinate emergency response efforts effectively. The problem statement aims to address the requirement for an IoT-based flood monitoring system that can seamlessly collect and analyze data from various sensors, provide real-time updates, and enable proactive decision-making in flood-prone areas. By implementing an IoT flood monitoring system, the



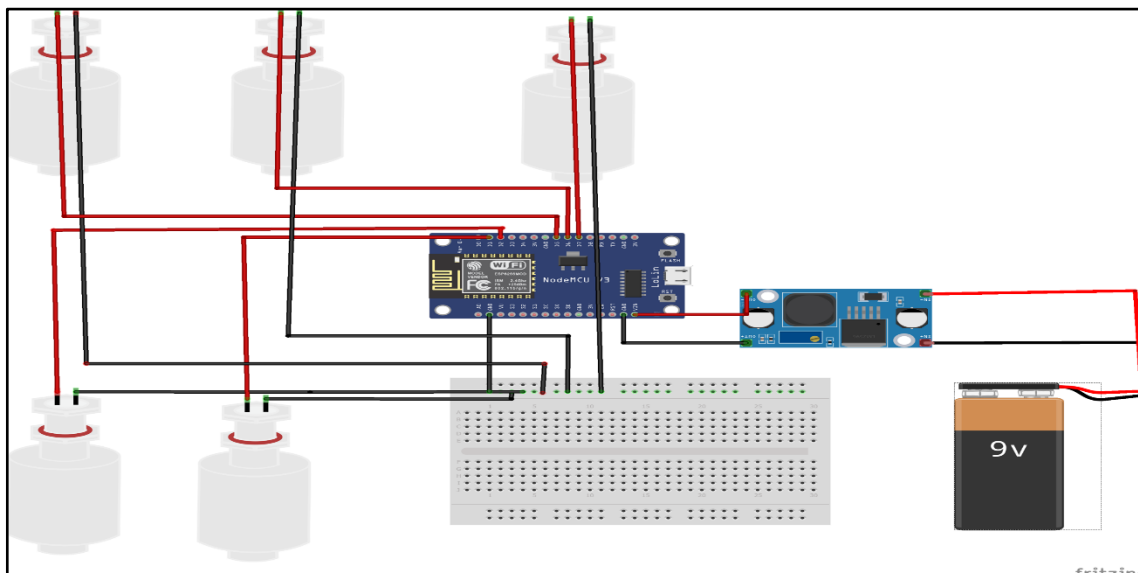
goal is to improve preparedness, minimize loss of life and property, and optimize resource allocation during flood events.

## OBJECTIVES

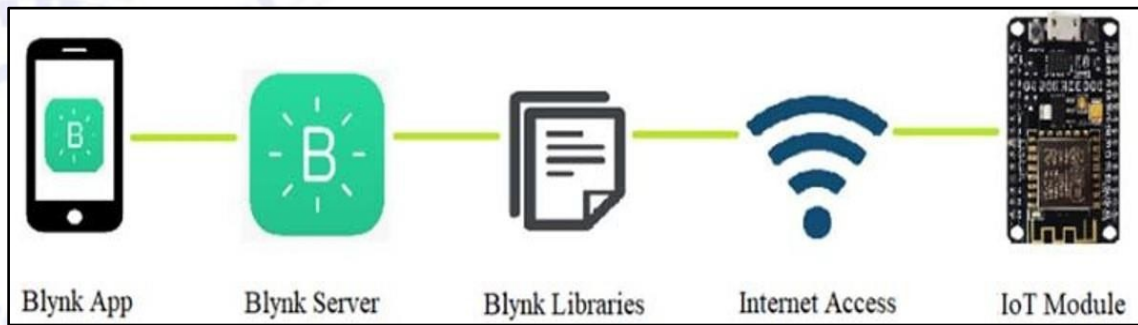
The objective of implementing an IoT flood monitoring system is to achieve an efficient and effective flood management approach by leveraging IoT technologies. The key objectives of such a system are as follows:

1. **Real-time Flood Detection:** Develop a network of IoT sensors capable of detecting and monitoring various parameters related to floods, such as water level, rainfall intensity, and weather conditions.
2. **Early Warning and Alert System:** Implement an early warning system that utilizes the data collected by IoT sensors to issue timely alerts and warnings to at-risk communities and relevant authorities.
3. **Remote Monitoring and Control:** Enable remote monitoring and control of the flood monitoring system, allowing authorities to access real-time data, configure sensors, and manage the system's operations from a centralized platform.
4. **Collaboration and Information Sharing:** Facilitate seamless collaboration and information sharing among stakeholders, including emergency response agencies, government bodies, and affected communities.

## METHODOLOGY



**Figure 1.** Circuit and components of this project



**Figure 1.0** IOT Diagram of this project

## COMPONENTS AND PROTOTYPE

In this prototype, we will demonstrate the integration of a NodeMCU (an ESP8266-based development board) and a float sensor to create an IoT-based flood monitoring system. The float sensor will be used to detect water levels, while the NodeMCU will enable connectivity and data transmission to an IoT platform.

In this setup, we are using Blynk Cloud as the IoT platform to connect and control our IoT devices. Blynk Cloud provides an easy-to-use interface and cloud infrastructure for IoT applications.

In the Blynk app, a project is created with widgets representing flood monitoring parameters, and virtual pins are assigned to these widgets. When the IoT device transmits the sensor data to the Blynk cloud server, the Blynk app on the mobile phone receives the data in real-time and displays it through the corresponding widgets. This allows users to monitor flood levels and other relevant data conveniently on their mobile phones, enabling timely response and decision-making.

## CONCLUSION

In conclusion, an IoT flood monitoring system integrated with Blynk holds substantial commercial potential as it addresses the growing demand for effective flood management solutions. By providing real-time monitoring, data analytics, and early warning capabilities, the system enables businesses to offer comprehensive flood monitoring services to governments, municipalities, and communities. Additionally, the integration of IoT technology with Blynk aligns with the Sustainable Development Goal of "Climate Action" (SDG 13) by aiding in climate resilience efforts, enhancing disaster preparedness, and supporting sustainable strategies for flood management. The system's ability to mitigate the impact of floods and promote proactive response contributes to the achievement of SDG 13 and supports climate action initiatives worldwide.

## REFERENCES

AZoCleantech.com. (2023, June 5). *The methods and benefits of flood monitoring*.  
<https://www.azocleantech.com/article.aspx?ArticleID=1476#:~:text=A%20flood%20monitoring%20system%20is,or%20can%20be%20solar%2Dpowered.>

*Flood monitoring and warning system.* (n.d.). Envira IOT. [https://enviraiot.com/flood-monitoring-warning-system/#:~:text=Advantages,%2C%20cloud%20or%20user%20application\).](https://enviraiot.com/flood-monitoring-warning-system/#:~:text=Advantages,%2C%20cloud%20or%20user%20application).)

*Flood monitoring system with IOT sensors - Renke.* (2021, September 25). <https://www.renkeer.com/flood-monitoring-system-with-iot-sensors/>

Nevon Projects. (2020, January 10). *IOT Early Flood Detection & Avoidance.* <https://nevonprojects.com/iot-early-flood-detection-avoidance/>

Prathaban, B. P., R, S. K., & M, J. (2023). IOT based early flood detection and Avoidance system. In *Lecture notes in networks and systems* (pp. 555–563). Springer International Publishing. [https://doi.org/10.1007/978-3-031-35501-1\\_55](https://doi.org/10.1007/978-3-031-35501-1_55)

Shanbhag, V. (n.d.). *IoT Based Flood Monitoring And Alerting System.* <https://www.bolttiot.com/projects/iot-based-flood-monitoring-and-alerting-system>

Zahir, S. B., Ehkan, P., Sabapathy, T., Jusoh, M., Osman, M. H., Yasin, M. H. M., Wahab, Y. A., Hambali, N. a. M. A., Ali, N., Bakhit, A., Husin, F., Kamil, M. K. M., & Jamaludin, R. (2019). Smart IOT Flood Monitoring System. *Journal of Physics, 1339*(1), 012043. <https://doi.org/10.1088/1742-6596/1339/1/012043>

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