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**JOHOR  
INNOVATION  
INVENTION  
COMPETITION  
AND  
SYMPOSIUM  
2023**



"Innovation Inspires a Society  
to be Critical and Creative"



# JOHOR INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2023

"Innovation Inspires a Society to be  
Critical and Creative"

**Editors-in-Chief**

**AHMAD KHUDZAIRI KHALID  
NUR INTAN SYAFINAZ AHMAD**



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## **Preface**

**In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.**

**This e-book compiles the extended abstracts that submitted to Johor Innovation Invention Competition and Symposium 2023 (JIICaS2023), where JIICaS2023 is a virtual platform for all creative minds to share and present their invention and innovation. The extended abstracts are divided into two categories, which are Category A (Higher Educational Student/ Any Recognized Institutional Students in Malaysia) and Category B (Primary/ Secondary School Students / Special Education School Students in Johor). Each abstract gives a brief background on the innovation or project.**

**We hope that this e-book will help the readers to get to know the innovation done by the students from both categories and get some ideas to develop future innovation products.**



## **ENHANCING JAVA LEARNING PROCESS: INTRODUCING AN INTERACTIVE MOBILE APPLICATION WITH VISUALIZATION**

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### **ABSTRACT**

Java is a vital programming language, yet conventional text-based tutorials pose challenges for students. To address this, an innovative and interactive mobile app for learning Java will be developed, focusing on trees, lists, and graphs. The goal is to enhance learning through visualisation, fostering a deep understanding of Java principles. The app will also serve as supplementary material for tutorial classes. Following the ADDIE model as the methodology, the app will be designed with user-friendly features and developed using Figma and React Native exclusively for Android. The app is accessible to Year 1 Software Engineering Information System (SEIS) students, and usability evaluations will showcase its effectiveness. The expected outcome is that users will find it highly usable, thereby overcoming any challenges they may face when learning Java and enhancing their engagement and understanding of the subject. In conclusion, the project aims to enhance Java education, offering an interactive app that empowers students to master coding principles effectively. Positive outcomes from usability evaluations are expected, reaffirming the app's significance in coding education.

**Keywords:** Java, mobile application, interactive platform, learning.

### **1.0 INTRODUCTION**

Java is one of the most popular object-oriented programming languages used for web development and mobile applications. Learning how to code in Java has become an essential skill in today's digital age. However, many students find conventional text-based tutorials challenging to grasp fully. These tutorials, often used in conventional classroom learning, may have drawbacks leading to complexities that hinder them from fully understanding Java concepts. To address this issue, a team has been created to embark on a project to develop an interactive mobile application that facilitates the learning of Java coding concepts through the power of visualization.

### **2.0 OBJECTIVE**

The primary objective of this project is to develop an innovative and interactive mobile application that guides users through the intricate world of Java coding, with a specific focus on trees, lists, and graphs. The goal is to enhance the learning experience by utilizing visual aids like images and graphics, creating a comprehensive platform that fosters a deep understanding of Java coding principles. Furthermore, this application will also serve as valuable supplementary material for tutorial classes, offering students a comprehensive and engaging tool for learning.

### 3.0 DESCRIPTION OF INNOVATION/METHODOLOGY

This mobile application represents a ground-breaking approach to learning Java coding. It comes with a user-friendly interface and real-time coding visualization will overcome the limitations of conventional text-based tutorials, providing a more intuitive and engaging learning experience. A clear outline of the idea has been provided, specifying the platform, target audience, topics covered, and the structured methodology that will guide the development of this application.

This application will be developed exclusively for Android, ensuring widespread accessibility to Year 1 students of the Software Engineering Information System (SEIS) course, our target users. It is custom-tailored for these students, catering to their unique learning requirements and preferences. Additionally, the core focus of the application revolves around the essential Java coding concepts of trees, lists, and graphs. This concentration provides a focused and comprehensive learning experience.

Furthermore, the development approach adheres to the ADDIE model, as the methodology, comprising the following phases:

- **Analyse:** A meticulous assessment of the learning needs and requirements of the target users to ensure that this application aligns seamlessly with their educational objectives.
- **Design:** Drawing insights from the analysis, an innovative mobile application has been crafted. This application incorporates a range of educational tools, including visual aids, step-by-step tutorials, interactive exercises, and quizzes.
- **Development:** During the development phase, creating the application itself with a strong emphasis on a user-friendly design and real-time coding visualization integration is the main focus. To achieve the goals, the team will be utilizing a combination of design tools, such as Figma, and React Native, a versatile and efficient framework for mobile app development, to create an engaging and effective learning platform.
- **Implementation:** This mobile application is available on the Android platform, ensuring that the target users can easily access it. This choice is in line with the fact that the intended users widely use Android devices, providing them with a familiar and optimized environment to learn Java coding concepts related to trees, lists, and graphs.
- **Evaluation:** Stringent testing procedures are carried out to validate the application's effectiveness, usability, and overall satisfaction. Usability evaluations are expected to be carried out among the target users which will include user feedback and mobile application testing.

This well-structured approach aligns with the project's objectives of delivering an effective, accessible, and engaging learning tool for students, equipping them with the knowledge and skills required to master Java coding concepts related to trees, lists, and graphs.

### 4.0 ADVANTAGE/IMPACT/RESULTS/NOVELTY

Usability evaluation will be conducted, including gathering user feedback and conducting rigorous testing, which will serve as a means to showcase the effectiveness of the developed mobile application. Users are expected to perceive the application as highly usable, beneficial, easy to learn from, and ultimately, satisfying. The distinctive advantages of this innovative approach reside in its capacity to tackle the challenges commonly encountered by Year 1

students of the SEIS course, thereby enhancing their understanding and engagement with Java coding concepts, specifically those related to trees, lists, and graphs. The impact of this application is profound, empowering each student to acquire and master these fundamental coding principles effectively.

## **5.0 CONCLUSION**

In conclusion, this project aims to enhance the way students learn Java coding. Through an interactive mobile application with visualization, the team aspire to provide an engaging and comprehensive learning tool. This approach not only fosters a deeper understanding of Java coding concepts but also empowers coding enthusiasts to develop essential skills effectively. As this journey is embarked upon, positive outcomes from usability evaluations are anticipated, further validating the significance of this endeavour in the realm of coding education.