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Developing an Android App and deploying it on Kubernetes

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Abstract: This paper presents a mobile application tailored to empower women against harassment and violence. The app integrates location tracking for real-time sharing with trusted contacts and an SOS alert for immediate assistance. It streamlines incident reporting to nearby police stations and facilitates uploading images as evidence. User-friendly interfaces ensure accessibility across diverse demographics. Through iterative refinement, the app continuously enhances effectiveness and user satisfaction. By providing dynamic features, it enables women to assert their safety rights and fosters communities intolerant of harassment and violence.

Keywords: Women's safety, Mobile application, Harassment prevention, Violence intervention, Location tracking, SOS alert, Police reporting, Evidence uploading, User-friendly design.

I. INTRODUCTION

In recent years, the prevalence of harassment and violence against women has emerged as a critical social issue, demanding urgent attention and effective solutions. Women across the globe continue to face various forms of harassment and violence in public spaces, workplaces, and even within their homes. Addressing this multifaceted challenge requires innovative approaches that prioritize women's safety and empowerment [1].In response to this pressing need, this research introduces a groundbreaking mobile application designed to empower women in combating harassment and violence. Leveraging the ubiquity of smartphones and the potential of mobile technology, the application provides a comprehensive set of features aimed at enhancing women's safety and facilitating prompt response to threatening situations [2].This paper aims to present the conceptualization, design, and implementation of the mobile application, highlighting its key features and functionalities. Additionally, it discusses the significance of each feature in addressing the diverse and complex challenges faced by women in navigating public spaces and seeking assistance in

Times of distress [3].By offering a user-centric and technologically advanced solution, this mobile application seeks to empower women to assert their right to safety and security. Through iterative refinement and continuous improvement guided by user feedback, the application strives to evolve into an indispensable tool in the fight against harassment and violence, fostering safer and more inclusive communities for all.

II. BACKGROUND

In today's digital era, ensuring the safety and well-being of women is of paramount importance. With the widespread adoption of smartphones and advancements in technology, mobile applications play a pivotal role in empowering individuals to safeguard themselves in various situations like Sexual harassment, Verbal harassment, Physical Assault, Forced Marriage, Psychological Abuse etc.

To address this critical need, our project focuses on the development of a Women Safety App—an innovative mobile application designed to provide women with a reliable tool for enhancing their personal safety and security. This Women Safety App aims to address this need by providing a user-friendly and accessible platform for women to enhance their safety and well-being.

2.1 SOFTWARE TOOLS AND TECHNIQUES

Android Studio: Our project will utilize Android Studio to develop the frontend interface and functionality of the Women Safety App.This involves designing intuitive user interfaces, implementing interactive features, and ensuring compatibility across various Android devices and OS versions.

NetBeans: Integrated Development Environment (IDE) for Java development. The role of NetBeans in developing a women's safety application is primarily to serve as an Integrated Development Environment (IDE) that provides tools and resources for creating and maintaining the application.

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Navicat: Navicat is a database management tool for MySQL. It ensures efficient storage of user and safety-related data in the development phase. Utilizing Navicat, we will design and manage the backend database system of the Women Safety App.

Kubernetes Deployment: Kubernetes is an open-source container orchestration platform that automates the deployment, scaling, and management of containerized applications. We will deploy the Women Safety App on Kubernetes to achieve scalability, resilience, and portability.

III. ANALYSIS AND DESIGN

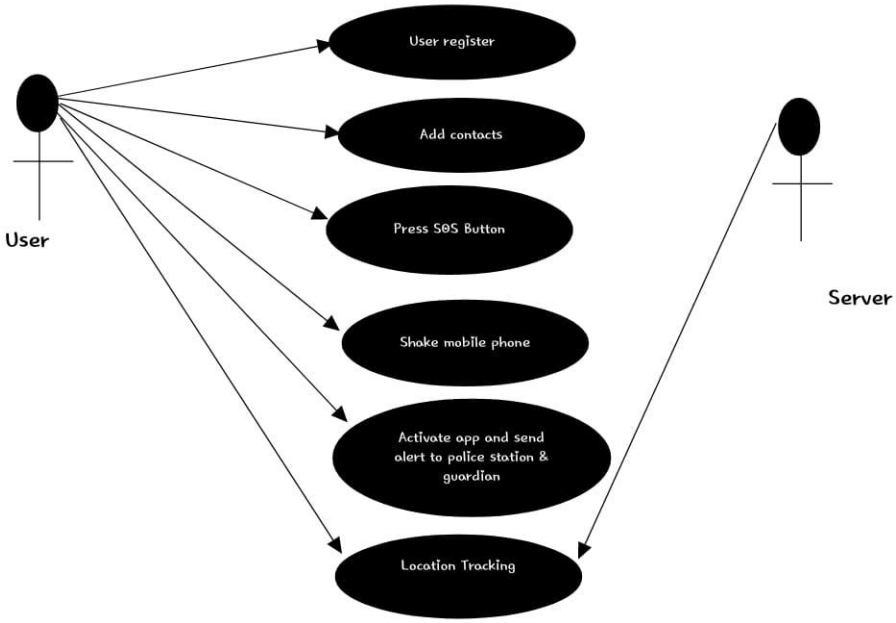

Fig 1: Use Case

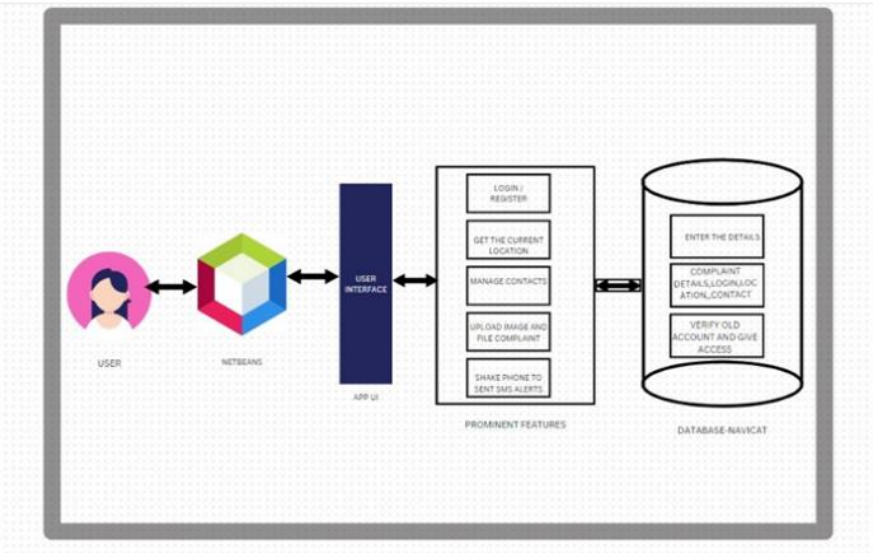

Fig 2: System Architecture

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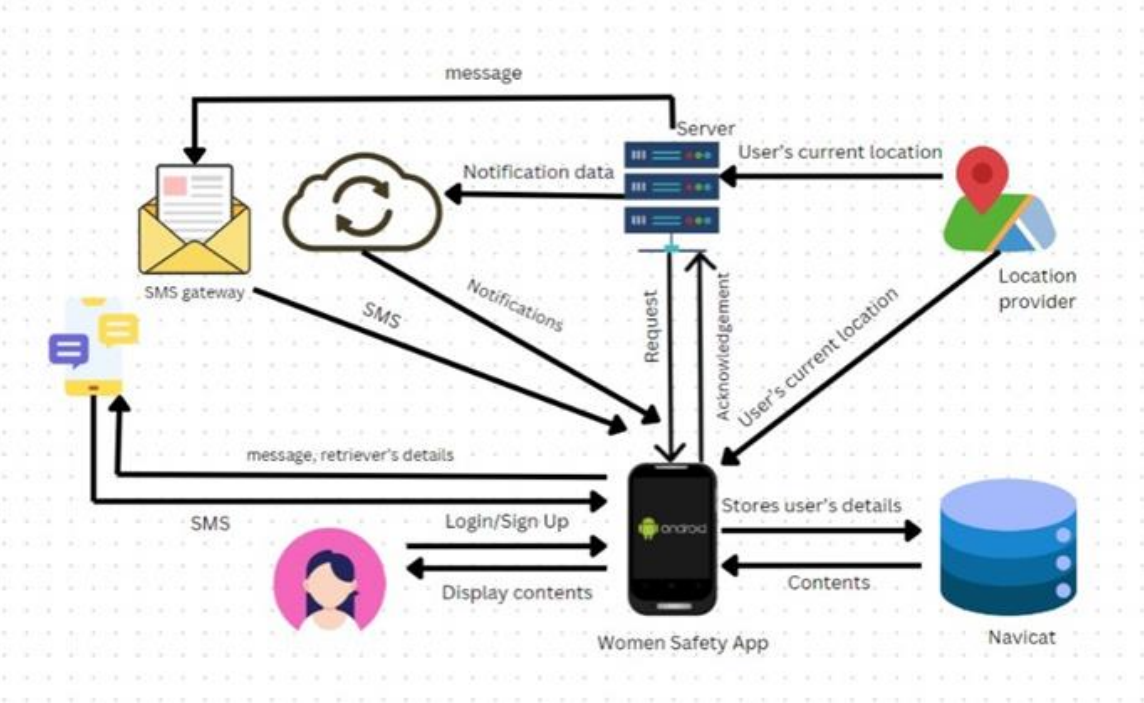

Fig 3: System Architecture including SMS and location features.

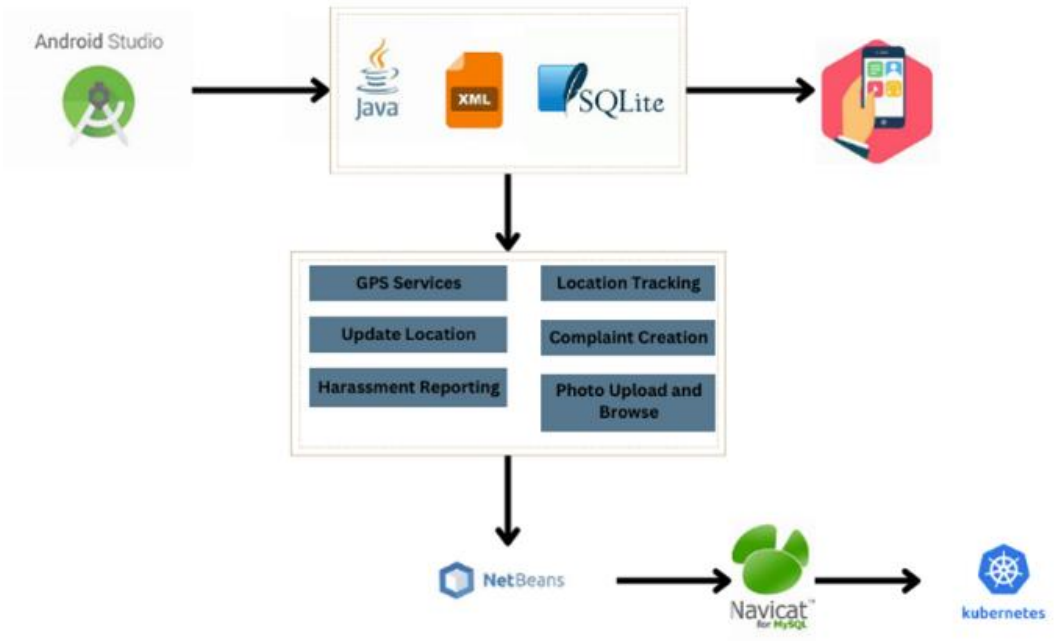

Fig 4: Infrastructure Design.

The women safety app is designed to empower and protect users through a comprehensive technological solution. The app is being developed using Android Studio, utilizing Java and XML for the frontend, creating a user-friendly interface for seamless interaction. The backend is powered by SQLite, ensuring efficient data management and storage. This robust combination allows for a secure and responsive user experience. To enhance scalability, reliability, and ease of deployment, the app is being containerized using Kubernetes, enabling efficient management of application containers. With a focus on women's safety, this app aims to provide a reliable and accessible tool for users to enhance their personal security, leveraging cutting-edge technologies for a safer and more connected community.

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IV. SYSTEM IMPLEMENTATION

4.1 Hardware Requirements:

System	Intel i3 2.1 GHZ (min)
Hard Disk	40 GB
Installed memory (RAM)	8 GB
Power supply	

4.2 Software Requirements:

Operating System	Windows 8+
Front End	Android
Language	JAVA/J2EE, Android, XML
Tool (IDE)	Android Studio, NetBeans, Navicat.
Database	MYSQL, Tomcat Server
Container Orchestration	Kubernetes

4.3 Screen Output:

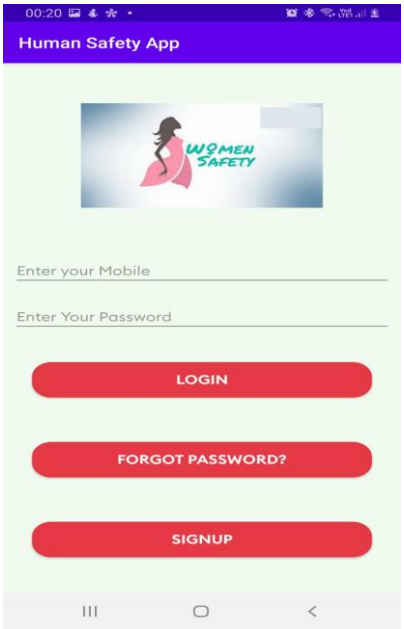

Fig 5: Welcome Page

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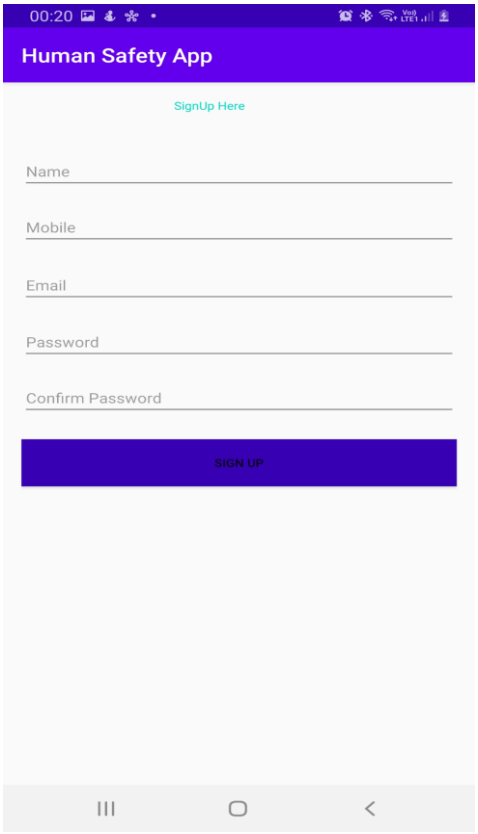

Fig 6: Signup

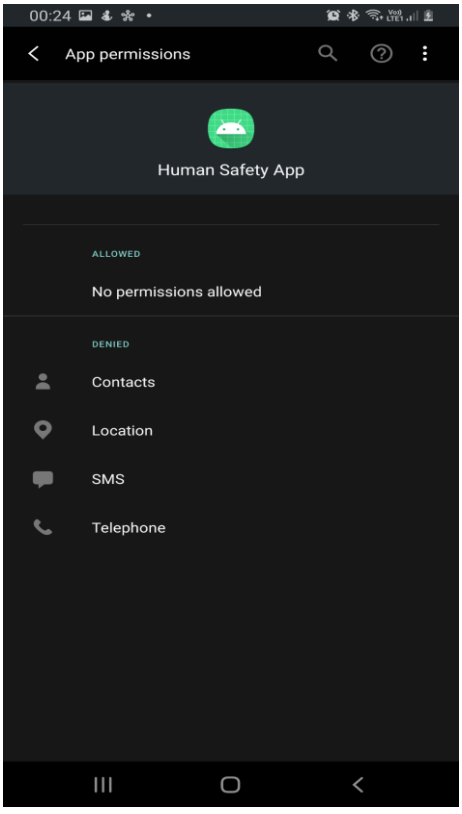

Fig 7: Set Permissions

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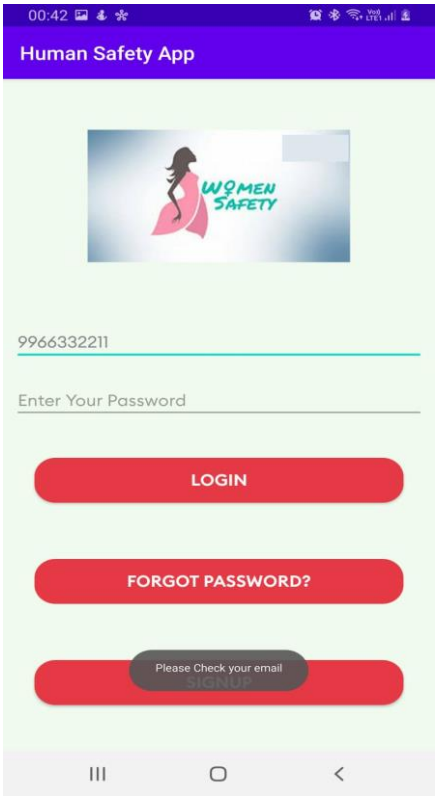

Fig 8: Forgot Password

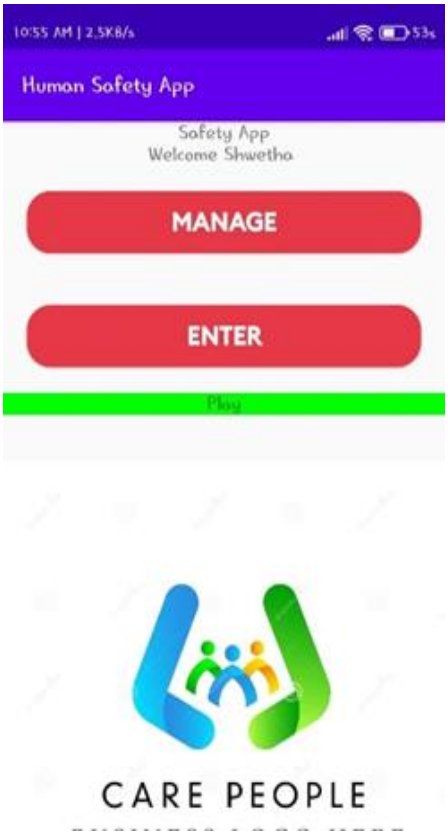

Fig 9: Manage Contacts to add Or edit guardians.

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Fig 10: Enter to upload images

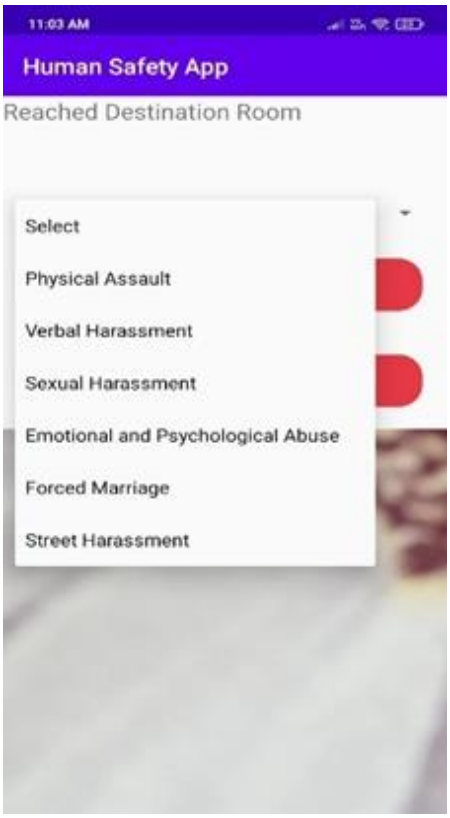

Fig 11: Assault options

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Fig 12: Upload photo

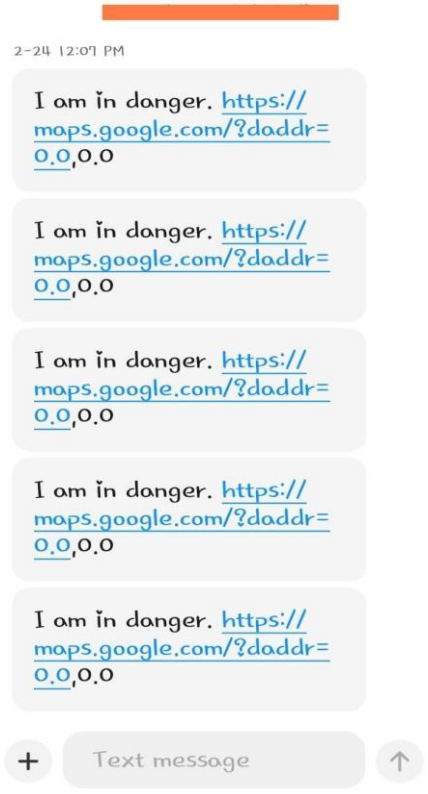

Fig 13: Emergency messages to guardians in case of shaking phone.

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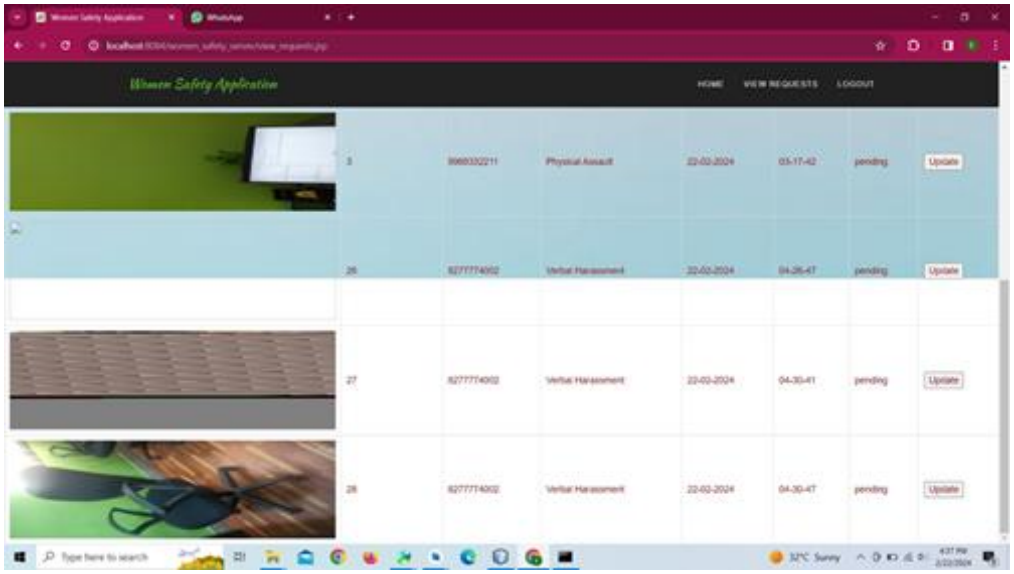

Fig 14: User complaints with proof

V. CONCLUSION

In this study, we proposed the design and implementation of a women's safety system in the form of an application. This app will act as a weapon for women, safeguarding their safety and security, and it will run on any Android smartphone. The app encompasses vital features such as SOS alerts, police complaints, an admin page, user complaints, and location tracking. This comprehensive suite of functionalities offers a multifaceted approach to addressing safety concerns. By integrating these features, the app aims to provide immediate assistance to users in distress, facilitate efficient reporting and management of complaints, and enable effective location tracking for enhanced safety measures.

A location tracking subsystem was successfully built in accordance with the objectives, and the necessary findings were reported. The system will be expanded in accordance with the goals outlined in the future scope. Deploying a women safety app on Kubernetes offers a robust, scalable, and secure solution to address the pressing issue of women's safety. Kubernetes' container orchestration capabilities ensure seamless management and scaling of app components, providing a responsive user experience even during peak traffic. So this represents a significant stride in leveraging technology to tackle social challenges and create safer environments for all.

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