GetawayGo

Research Plan

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Problem Statement

The short-term accommodation market is growing rapidly, but ensuring that such application can handle the demands of a significant number of users while maintaining performance, security, maintainability, and reliability is a complex challenge. The problem is further complicated by traffic loads, especially during peak travel seasons, and the need for the platform to be scalable. Lastly, the platform needs to be user-friendly and easy to use.

Opportunity

GetawayGo has the opportunity to develop a scalable, microservices-based platform that can support short-term accommodation bookings. By utilizing cloud-native tools and modern architectural patterns, the platform can be designed to handle varying numbers of requests, ensure secure transactions, and provide a good user experience.

Research Questions

Main Question

How can a scalable microservices-based platform effectively support short-term accommodation bookings while ensuring high performance, user-friendliness, and security for global travellers?

Sub-Questions

1. How can the platform dynamically scale to handle varying loads of users and bookings during peak times?
2. What architectural patterns can ensure high availability and fault tolerance in a microservices-based platform?
3. What security measures are necessary to protect sensitive user data on a global platform?
4. How can communication between different microservices be efficiently managed to avoid bottlenecks and ensure real-time data flow?
5. What strategies can be employed to effectively monitor and manage microservices to prevent service disruptions?
6. How can cloud-native tools be used to automate the scaling, deployment, and management of services to improve efficiency?

Research Methods

For each sub-question, I will use a combination of research methods (ICT Research Methods 2024) based on the DOT Framework to ensure a comprehensive approach. The main research strategies I am going to incorporate are: Library, Workshop, Lab, Showroom, and Field. Below is a breakdown for each sub-question:

1- Sub-Question

How can the platform dynamically scale to handle varying loads of users and bookings during peak times?

- Research Methods: Available product analysis, Best good and bad practices, Literature Study, Expert Interview

- Approach: I will tackle this question by reviewing already existing literature and products. I will investigate the best good and bad practices and will conduct one or multiple Expert Interviews.
- Output: A comprehensive research outlining dynamic scaling strategies and identifying key cloud services and patterns that support scalability.

2- Sub Question

What architectural patterns can ensure high availability and fault tolerance in a microservices-based platform?

- Research Methods: Literature Study, IT architecture sketching, Expert Interview
- Approach: I will approach this question by reviewing existing literature on common architecture patterns. I will create architecture diagrams to visualize the desired output. Also, I will conduct an Expert Interview.
- Output: A detailed research about design patterns in microservices' architecture and an architecture document with potential designs.

3- Sub-Question

What security measures are necessary to protect sensitive user data on a global platform?

- Research Methods: Literature Study, Security test, Guideline conformity analysis
- Approach: I will conduct a literature study on global security standards and compliance (e.g., GDPR), followed by security tests on the platform for vulnerabilities.
- Output: A security report and guideline conformity analysis documenting necessary protections and risk mitigations.

4- Sub-Question

How can communication between different microservices be efficiently managed to avoid bottlenecks and ensure real-time data flow?

- Research Methods: Literature Study, System test
- Approach: I will study communication methods through literature and run tests on the system to ensure reliable data flow.
- Output: Report identifying the optimal communication protocol for the platform, supported by test results

5- Sub-Question

What strategies can be employed to effectively monitor and manage microservices to prevent service disruptions?

- Research Methods: Available product analysis, Literature Study
- Approach: I will investigate existing monitoring tools and strategies (e.g., Sentry) and compare their suitability for real-time service monitoring and management.
- Output: Research on the recommended monitoring solutions and a monitoring report for the GetawayGo platform.

6- Sub-Question

How can cloud-native tools be used to automate the scaling, deployment, and management of services to improve efficiency?

- Research Methods: Literature study, Available product analysis, Document analysis
- Approach: I will analyse cloud-native tools through library research, using available literature and product documentation.
- Output: A research document detailing on the cloud tools that can be employed for automated scaling, deployment, and management.

Deliverables and Time Estimation

The deliverables are research reports for each sub-question. This will lead to finding the answer to the main question. Doing this research, I will be able to develop an enterprise software application that is highly scalable, reliable, easy to maintain, has good performance, and is compliant with security standards.

The deadline of this research is 12th of January, 2025.

References

ICT Research Methods (2024). Retrieved from:

https://ictresearchmethods.nl/