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|  | | | | Research Plan |  | | | |
|  | | | | March, 2025—Viktoria Todorova—First Draft |  | | | |
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# Context

In this section you will find information on the context of my project and the research that I am going to perform in order to develop a reliable and effective solution. Below you can find the problem, that stands behind the idea for this study and some more information on the goal of the research.

##### Opportunity Statement

When developing a financial web application, building a reliable architecture is crucial. Security and scalability should be a predominant priority to ensure the safety of the users and their data and to guarantee their positive experience with the product.

##### Research Goal

The aim of this study is to explore the best practices for developing a secure and scalable application. It will investigate the opportunities that cloud-native architecture provides and how it can reduce costs and downtime, without compromising security and reliability. It will focus on selecting the best cloud services for this project and developing a suiting architecture in order to provide the best possible finance web application.

# Research Questions

In this section you can find the research questions that will serve as a structure of this research. I will provide one main question, that summarizes the topic of this study. Furthermore, I will list a few sub-questions that divide the research into smaller issues, which would be easier to research.

##### Main Question

How can a cloud-native architecture be designed to ensure scalability, security, and reliability for a financial web application?

##### Sub-Questions

1. What cloud services (serverless, containerization) can be used to ensure application efficiency and reliability during increased user traffic?
2. How can security best practices be implemented in a cloud-native finance web app?
3. How can DevOps principles and CI/CD pipelines be integrated into the cloud infrastructure for seamless deployment?
4. What are the best ways to handle and store financial data in a cloud environment while ensuring compliance with GDPR regulations?

# Approach and Planning

In this part of the document, I will describe the methodologies I intend on using to answer the above-mentioned questions. I will also present an initial planning and estimation of the required time for completing each part of this study.

##### Methodologies

To complete this research, I will rely on the DOT framework. I will determine the most suitable methodologies for investigating each topic to ensure a structured workflow through the semester. You can see the estimated approach per each question on *Fig. 1.*

//add prototyping and field research

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| RQ | Methodologies | |
| 1 | library - Good and Bad Practices  - Literature Study | workshop- IT Architecture Sketching |
| 2 | library- Literature Study | showroom- Peer Review  -Pitch |
| 3 | library - Community Research  - Literature Study | showroom-Pitch |
| 4 | library - Literature Study  - Expert Interview | showroom- Guideline Conformity Analysis |

*Fig. 1 – Table that explains the methodologies per question*

##### Planning

I am also providing a table with the planning and the estimated time for each task (*Fig. 2*). This schedule is not concrete, so some minor changes are expected throughout the semester.

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| Week | Activities | RQ Covered |
| Week 1-2 | Conduct a literature review on cloud-native architectures, security best practices, and scalability in financial applications. Identify key challenges and existing solutions. | All (1-4) |
| Week 3-5 | Analyze good and bad practices in cloud-native finance applications. Begin IT architecture sketching. | RQ 1 |
| Week 6-7 | Conduct peer reviews and evaluate security best practices. Develop a security strategy for cloud infrastructure. | RQ 2 |
| Week 8 | Conduct community research on CI/CD and DevOps best practices. Develop a deployment pipeline strategy. | RQ 3 |
| Week 9 | Conduct expert interviews and analyze GDPR compliance guidelines for handling financial data. | RQ 4 |
| Week 10 | Validate architecture and security measures with stakeholders. Conduct a final pitch for security and CI/CD recommendations. | RQ2 & RQ3 |
| Week 11 | Finalize research findings and compile the report. Review results, make improvements, and prepare the final presentation. | All (1-4) |

*Fig. 2 – The estimated time for each activity necessary to complete the research*

##### Expected Deliverables

At the end of this research, I should have several key deliverables:

* Research Report
* Cloud Native Architecture for a Finance App
* Recommendations and Best Practices for Scalability and Security