



COS30041 Creating Secure and Scalable Software

Research Proposal(s) for High Distinction (HD)

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Submission for Feedback (Week 6 – 7) and Final Approval (Week 8, Fri, 6:30pm)

[Note: Based on past experience, it will take at least 2 to 3 submissions to make it right. So, start early]

Instructions - This document is for students aiming to achieve High Distinction (HD).

For **HD**, you need to complete the software for D grade as well as a research report. You need to propose a “research topic” on **the technologies related / similar to those discussed in this subject**. **Note: Database Technology research topic like “comparing ORM mechanisms in Java and .NET” will not be approved**. Although this subject has database discussions (e.g. JDBC / ODBC and ORM), we are just using it to develop our software application. We are more interesting onto technologies other than database technologies. Possible options are

- R1 Implement the same functionality of your D software project using two different technologies of the same language (e.g JSF vs PrimeFaces; different form of Web Services – JAX-RS vs JAX-WS).

You can choose the criteria to compare between the two technologies / techniques but you must compare them **quantitatively**. For example, my development time using technology A is 180 minutes whereas that of technology B is 240 minutes. Hence, technology A is considered to be better than that of B in terms of development time. **Qualitative comparison (e.g. it is faster due to less code) is not considered to be good research and hence will be rejected.**

- R2 Implement the same functionality in your D software project twice¹ (e.g. one using Java EE technologies and the other using a comparable .NET technologies or some other JavaScript framework like Angular.js or Node.js).

Again, you can choose the criteria to compare between these two technologies but you must compare them **quantitatively**.

- R3 Other please specify (to be detailed in the research proposal)

Again, you can choose the criteria to compare between these two technologies but you must compare them **quantitatively**.

In your research, you must (1) collect useful and relevant data for your quantitative comparison purposes, (2) perform your own analysis and (3) draw conclusion based on your data.

Intended Learning Outcomes (extracted from Unit Outline)

1. Build and deploy secure and scalable application using contemporary frameworks
2. Explain and apply strategies, patterns and frameworks to address a range of scalability issues
3. Explain and apply strategies, patterns and frameworks to address a range of security issues
4. Use contemporary tools to evaluate the scalability and security of applications

¹ Not the whole project. Just one functionality in your software project.

RESEARCH PROPOSAL for HD**Some Background Information on your D software****Software Title: Ragib Television (website)****Introduction**

I am planning on developing a web application where people find out information about different TVs available and can directly purchase them. Furthermore I wish to let 1 authorised user (i.e. manager/ admin account) access all these information in full details, all purchase by certain person or all purchases of single product type (depending on his option of choice).

Research Report: Comparison between JavaEE and .NET for website data submission**Research Topic: Comparison between JavaEE and .NET data submission in terms of webpage forms**

I wish to test the functionality of “a webpage’s form’s data submission to database” for webpage created using JavaEE and .NET and see which is better by comparing certain matrixes which are detailed below

Research Option: R2**Comparison Criteria: Ease of Development and Performance**

1) I would compare ease of development between both by:

A) Seeing number of files needed in order to set up same functionality (alongside no of lines in code),

For number of files and lines of code needed for each, I would count them down and note down their values for comparison in a table

B) Seeing the time it took to develop both features from back to front

For development time, I would note down time taken to research and code that functionality from backend to the front and also note down the errors that had popped up and ways I had troubleshoot them (in brief)

2) I would compare performance by Observing the time required by both to store the same amount of data:

For performance I would note down the time taken in order for the same data to be stored using both methods

Research Plan:

At first I would research on how to use .NET in order to create the same functionality needed (from backend logic to the front end). Then I would benchmark both of them for the given two comparison criteria, noting down all the matrixes given for both (after measuring them several times for same data). Then I would use that as an analysis to compare them and say which is better in this scenario and also use it as a basis to develop a hypothesis on which would be better in larger scenarios with relevant reasoning and data extrapolation/scaling