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Programme: MSc Digital and Technology Solutions (Software Engineering)

Project Title**:** Software Engineering Aspects of Continous Development and the Effect within Project Teams

Client/Sponsor: Angus Greenland (DXC)

Supervisor (if known): Gavin McClary

## Abstract

*The current approach for less experienced/junior members of the team is to book allocated time with a senior mentor or similar, as a result, this reduces the output of the senior mentor and their commitment to concurrent tasks. Using an application that can provide a response that guides you to a better understanding of the issue, delivers empowerment, and provides Continuous Development with each action to the repository. From this project, I would expect to see an easier method for junior team members to progress and learn through their own momentum. An overall improvement in the production of work, self-development, and team morale. Will providing a junior team member with the tools to self-learning improve Continuous Development?*

## Aim & Objectives

The aim of this project is: To design, develop and implement a Proof of Concept (PoC) application that allows less-experienced members of the team to use continuous integration (GitHub/githooks/AWS/code editor etc/cloud watch) in a form of set driven commands to automate the checking of any commits, using client-side hooks, to a GitHub repository. This is part of a wider approach to Continuous Development. The use of this is to save time for the senior member needing to check the commit for validation, secrets not hidden, or overall not a clean build that may affect any merge.

The return should be presented to the user in a well-known instant messaging application (Slack) using the ideals of ChatOps mixed with DevOps, with the potential for Microsoft Teams integration in the future.

The objectives to achieve this aim are:

1. Implement a working PoC utilising concurrent technologies.
2. Design and implement ChatOps processes.
3. Design and Implement DevOps processes.
4. Provide users with an up-to-date process of use.
5. Create a fresh user interface for the user’s to respond to actions.
6. Design architecture and implementation on AWS.

## Research

The research question is: “*Will the culture of junior team members using DevOps processes and tools affect the impact of Continuous Development*?”

Research areas of interest include: Instant messaging, GitHub, cloud development tools, Advantages and disadvantages of using this method.

The goal of reviewing the literature on **code quality using automation for code review** is to identify the advantages and disadvantages of using this method, highlighting the importance of a newcomer experience and guiding them through this process of code review.

The practical application of the research is expected to includethe best approach to developing a workable PoC which utilises GitHooks, GitHub, a nominated chat client (Slack) and AWS services. The practical element will enable an investigation into the effectiveness of DevOps, processes and the tools for learning opportunities.

## Practical Element

The practical element will involve planning, designing, developing, and testing a PoC of a “chatbot” using ChatOps methods and DevOps procedures utilising a cloud-based environment and will demonstrate collaborative and learning improvements throughout.

Implementation of an Agile/Scrum methodology will be approached due to the nature of Continuous Development as it requires an accurate and efficient system for planning and tracking tasks and sprints with the team development.

The practical element will be developed using approaches such as client-side githooks, GitHub repositories, and a cloud computing aspect for developing the chatbot. Primarily, the language chosen will be Python and a GIT CLI will need to be configured.

The practical outcome that this project aims to provide is: A workable PoC that the client can provide to new recruits/less experienced team members as part of a training package for continuous integration and DevOps.

The sponsor/client will use it to provide an introduction at a low level to GitHub/git commits and how to troubleshoot any validation/formatting errors.

To evaluate the success of the practical outcome I would require various team members who are less experienced to run through the installation/guidelines of this application. This will help improve the application based on multiple users’ interactions.

## Learning and Development

This project involves knowledge and skills including software development, cloud technologies, microservices, GitHub, continuous integration, and monitoring.

Areas for development include Cloud Technology, Software Development, Agile Project Management, and feedback from less experienced team members will be improved through engaging in the research and practical aspect of the project lifecycle.

## Research Ethics

This research does not involve human participants and does not need ethical approval from the University of Sunderland Research Ethics Committee

# References

*Bibliography*

1. DEV Community. 2019. *5 ways to create a junior developer-friendly culture*. [online] Available at: <https://dev.to/httpspauline/5-ways-to-create-a-junior-developer-friendly-culture-3n4> [Accessed 16 February 2022].
2. Atlassian, n.d. *Git Hooks | Atlassian Git Tutorial*. [online] Atlassian. Available at: <https://www.atlassian.com/git/tutorials/git-hooks> [Accessed 16 February 2022].

# Evidence / Appendices

## Letter/Email of support from Client / Sponsor

*Guidance: short letter from your sponsor client. It can be as simple as:*

I can confirm that I support Alan Heslop’s project proposal “Software Engineering Aspects of Continous Development and the Effect within Project Teams” for their MSc project as detailed in the Client-Sponsor MSc Project Proposal Template.

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| Angus Greenland  (Project Client)  Date: 15/02/2022 |

## Supervisor (if applicable)

*Guidance: short email of support from a supervisor*

I can confirm that I have agreed to be Alan Heslop#s supervisor for their MSc project

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| Gavin McClary  (Project Supervisor)  Date: \_\_\_\_\_\_\_\_\_\_\_\_\_ |