



School of Computing, Engineering, and the Built Environment Edinburgh Napier University

PHD STUDENT PROJECT

Funding and application details

Funding status: Fully funded project (worldwide)

Application instructions:

Detailed instructions are available at <https://blogs.napier.ac.uk/scebe-research/available-phd-student-projects/>

Prospective candidates are encouraged to contact the Director of Studies (see details below) to discuss the project and their suitability for it.

Project details

Supervisory Team:

- DIRECTOR OF STUDY: Dr Saima Rafi (Email: S.Rafi@napier.ac.uk)
- 2ND SUPERVISOR: Prof. Xiaodong Liu

Subject Group: Computer science

Research Areas: Computer Science, Software engineering

Project Title: Understanding the Drivers and Challenges of DevOps Outsourcing in Context of Client and Vendor Relationship

Project description:

Alongside DevOps moment, a wave of DevOps outsourcing has arrived in which DevOps process is used as a service provider. Outsourcing companies offer DevOps practices, to use as a cloud-hosted kit and help the team members to sustain continuous delivery[1], continuous testing, and continuous integration into their development process [2,3]. This concept has made the task easy for organizations and startups to use DevOps by borrowing the services from DevOps outsourcing companies having a great level of expertise to improve their business values, operating cost, and automation to meet the demands [4]. According to State of DevOps Report [5], it is believed that companies that outsource DevOps

get 24 times faster failure recovery, 22% less time spent on unplanned work, and three times fewer change rate failure. This shows that DevOps outsourcing simplifies the co-existence of various cooperate departments, by changing the cooperate culture and improving the performance of an organization [6].

However, there are various factors associated with DevOps outsourcing in the context of client and vendor e.g. relationship between team members and stakeholders [1,8], balancing outsourcing in DevOps [7], available skills[8], corporate policies [9], and other factors. Moreover, DevOps is all about team culture and collaboration, outsourcing in an organization can only work well when the client and vendor work as a tuned piano. The objective of this Ph.D. project aims to identify the drivers and challenges incorporated with DevOps outsourcing in the context of client and vendor relationships to maintain operating costs and collaborative culture of automation. This project is experimental to explore the factors affecting DevOps outsourcing and mitigate the risks in this pathway.

Prospective applicants are encouraged to contact the Supervisor before submitting their applications. Applications should make clear the project you are applying for and the name of the supervisor(s).

References:

- [1] Rafi, S., Akbar, M.A. and Manzoor, A., 2022, June. DevOps Business Model: Work from Home Environment. In Proceedings of the 26th International Conference on Evaluation and Assessment in Software Engineering (pp. 408-412).
- [2] <https://azure.microsoft.com/en-gb/products/devops/>
- [3] <https://about.gitlab.com/small-business>
- [4] Baozhong, W.A.N.G., Wensheng, Y.A.O., Huan, L.I.A.N.G., Hongming, Q.I.A.O. and Yong, C.H.E.N., 2020. DevOps implementation method and practice in software development outsourcing scenarios. Telecommunications Science, 36(12).
- [5] <https://www.puppet.com/resources/state-of-devops-report>
- [6] Díaz, J., Perez, J.E., Yague, A., Villegas, A. and de Antona, A., 2019. Devops in practice—a preliminary analysis of two multinational companies. In Product-Focused Software Process Improvement: 20th International Conference, PROFES 2019, Barcelona, Spain, November 27–29, 2019, Proceedings 20 (pp. 323-330). Springer International Publishing.
- [7] Langerman, J. and Leung, W.S., 2023. The effect of outsourcing and insourcing on Agile and DevOps. Journal of Information Technology Teaching Cases, p.20438869231176841.
- [8] Khan, M.S., Khan, A.W., Khan, F., Khan, M.A. and Whangbo, T.K., 2022. Critical challenges to adopt DevOps culture in software organizations: A systematic review. IEEE Access, 10, pp.14339-14349.
- [9] Hering, M., 2018. DevOps for the modern enterprise: Winning practices to transform legacy IT organizations. IT Revolution.

Candidate characteristics

Education:

A first-class honours degree, or a distinction at master level, or equivalent achievements in computer science

Subject knowledge:

- DevOps outsourcing,

- Software engineering process management and
- Machine Learning

Essential attributes:

- Knowledge of ML performing classification (decision trees, support vector machines etc),
- DevOps, and
- Strong grips of statistical concepts

Desirable attributes:

- Python, Java, PyTorch, TensorFlow, R