KTA Job Description

Job title
Logistics Operational Analyst (Simulation-Optimisation) KTP Associate

Salary range – £33,000 to £45,000

JOB PURPOSE

This is an applied operational research project in collaboration with the Birmingham City University and Accident Exchange (AX) Limited to provide a Decision Support System (DSS) for effective strategic and operational management of logistics in near real-time at lowest cost.

This is an exciting opportunity for an ambitious researcher to fast-track their career development as a Knowledge Transfer Partnership (KTP) Associate, utilising skills in simulation and optimization with a specific focus on fleet management and hub location/allocation optimization.

You will receive practical and formal training, gain marketable skills, broaden your knowledge and expertise within an industrially relevant project, and gain valuable experience from industrial and academic supervisors. The KTP Associate will also benefit from a Personal Development Budget of £4,000. Also, you will have full access to university resources to complete the project and experienced academic and company project supervision, with project support by a dedicated, sector leading KTP Office.

Accident Exchange (AX) Limited is a leading service provider in the UK vehicle replacement market. AX provides accident claim management and related services including replacement vehicles to the automotive sector. AX-Automotive has a very large-scale logistics operation with thousands of vehicles and a significant number of drivers in its fleet. Designing an efficient network of logistics and managing fleet operations effectively are critical for the company, its competitiveness, and sustainability. The KTP will optimise both day-to-day decisions on vehicles and drivers and medium-term decisions on fleet make up and depot location with the aim of meeting their obligations under service level agreements with their customers at lowest possible cost.

PURPOSE OF THE POST:

- Review and evaluate AX-A’s existing systems and supply chain network including its suppliers to plan the overall solution approach and develop the feasibility study.
- Review current business and decision-making processes and develop flowcharts if not available, otherwise suggest improvements if possible.
- Review the relevant academic literature and propose changes on the project plan.
- Develop a prediction model for accidents.
- Explore various statistical and machine learning algorithms to find the most appropriate models based on the nature of the accident data and defined clusters.
- Develop a simulation optimization model for the supply chain network and fleet management to identify car depot locations and allocation of inventory.
- Develop a workforce scheduling and routing model and a Decision Support System (DSS).
- Embed knowledge within the company to test and improve the decision support tools that build a legacy beyond the project timeline.
- Consolidate case study research to finalise draft journal papers to be submitted to high-quality scientific peer-reviewed journals.
- Transfer the knowledge of the applied state-of-the art techniques to Accident Exchange.
The project

Key objectives include:
1. Develop models which can be combined and integrated in a package as decision support system (DSS) for the company.
2. Embed the DSS an interface to receive input changing data from company without any extra coding modifications, enabling company to update accident frequency prediction models, network optimization solutions, specifically hub location-allocation, run simulation model for monitoring the car inventory profiles and near real time scheduling of drivers.
3. Design monitoring dashboards for accident frequency prediction, network simulation-optimization and scheduling models.

Main activities and responsibilities:

Activities

- Reviewing/refining the workplan.
- Creating Personal development plan.
- Presenting a case study to show and transfer knowledge about how to use statistical methods for predictions, how to use a simulation for logistics and network optimisation, and how to use optimization for scheduling and routing via workshops.
- Developing process flow diagrams depicting the flow of business processes, for the current business and decision-making processes related to the project topics
- Mapping AX-A’s supply chain network including its stakeholders with their capacities
- Identification and setting criteria, objectives and KPIs
- Carrying out literature review related to location-based accident frequency estimation, network and fleet optimization, and workforce scheduling and routing
- Revising the project plan and propose a new and updated integrated solution approach
- Carrying out a data exploration and validation exercise to explore the main characteristics of the data
- Clustering analysis based on geographical-based traffic-accident density and delivery locations
- Fitting probability distribution functions (PDF) for the expected number of daily accidents and daily deliveries in each regional cluster
- Developing a user-friendly Decision Support System (DSS) that will allow for predicting accident and delivery frequencies in different clusters with varying conditions
- Developing a mathematical model generating reasonable candidate depot locations
- Integrating prediction models to the simulation model
- Calculating Cost Parameters
- Structuring the simulation optimization model to find optimal depot locations, inventory and sourcing policies
- Visualizing the solutions in GIS map with monitoring the KPIs in dashboards
- Analysing the results for verification and validation of the simulation-optimization model
- Analysing risk considering different possible risk events
- Developing a mathematical model for daily workforce scheduling and designing metaheuristic optimization algorithm to solve it
- Developing a user-friendly Decision Support System (DSS)
- Providing a guide, training and workshops presenting and preserving the results and disseminating models
- Co-authoring articles in collaboration with academics at the BCU.
Responsibilities

- To deliver the project stages as described in the KTP project plan
- To ensure a successful implementation of the project and embedding the new processes and knowledge within the organisation
- To work with the company management and stakeholders within the organisation to ensure the KTP project aligns to the business’ requirements
- To maintain adequate documentation and provide regular progress reports throughout the project lifecycle
- Deliver presentations to immediate project team members and technical experts

Skills and experience

Person Specification:
Applicants should have a minimum of Masters’ degree (or equivalent research experience) in Industrial and Systems Engineering, Operational Research, Computer Science, Logistics and Supply Chain, or a related discipline along with relevant work or project experience. Experience is required in applied OR, simulation, logistics and desirable in fleet logistics; proficiency in computer programming is also required; knowledge of machine learning techniques is desirable, and the ability to work with academics, and industry supervisors.

The models and algorithms developed are expected to be of sufficient scientific novelty that they will lead to articles published in leading OR and transport scientific journals. KTP associate is also expected to disseminate the research findings at project meetings, international conferences, and industrial events.

Essential:

- Can integrate datasets from different sources and manipulate data from big data databases.
- Excellent knowledge of applied statistics and machine learning techniques for developing prediction models.
- Ability to use simulation software and develop optimization models.
- Practical experience in developing simulation-optimization models for logistics systems.
- Proficiency in computer programming such as Java or Python and using open-source libraries for data analysis (R) and visualisation tasks.

Desirable:

- Knowledge of database management and big data analytics
- Knowledge of IT systems
- Report/paper writing skills
- Practical experience of working in fleet and/or supply chain management.
- Academic acumen to enable successful reporting through research publications in academic journals and marketing/training materials;
Personal Skills:

Essential:
- Excellent communication skills
- An ability to work to tight deadlines (with attention to detail) and maintain high standards of work
- An ability and aptitude to work effectively as part of an interdisciplinary team.
- Self-starter and self-motivated, who is happy to work alone and as part of an embedded team, and self-management and planning skills to make optimum use of time;
- Strong organisational and leadership skills in successfully implementing and embedding new innovations within a company or organisation
- Excellent command of written and spoken English
- Proactive and results driven
- Effective team member

Desirable:
- On a personal note, the Associate should be enthusiastic, motivated, punctual, conscientious, trustworthy and a good team worker.
- A clean driving license and a willingness to travel to depots, suppliers and relevant stakeholders throughout the UK;
- Experience in project management
- Experience in leadership roles and responsibilities

Knowledge Transfer Partnerships (KTP)
A Knowledge Transfer Partnership (KTP) is a three-way project between a company, a university and a graduate (known as an Associate), which enables the transfer of knowledge, technology and skills to which the company currently has no access. Supported by the university, KTP Associates manage strategic projects within the company. A KTP can help graduates to enhance their career prospects by providing them with an opportunity to manage a challenging project, which allows them to use their degree, and is central to an organisation’s strategic development and long-term growth. Whilst the Associate leads the KTP project, they are supported by experienced staff from the company and university. They are also assigned a KTP Adviser, who supports them in maintaining good working relationships within the partnership and in planning their professional development in broad terms. For more information, visit the Innovate UK website.

Expectations of all staff

Professional standards
All staff employed by Birmingham City University are expected to exhibit high professional standards which promote and demonstrate the University’s core values of Excellence, People Focused, Partnership Working, Fairness and Integrity.

Equal opportunities
All staff are expected to understand and enact the University’s commitment to ensuring equality and diversity in all activities. This commitment is enshrined in the Equality Statement and core values.

Dignity at work
Every member of staff has a responsibility to ensure colleagues are treated with dignity and respect.

The University is committed to creating a work environment for all staff that is free from harassment, intimidation and any other forms of bullying at work, where everyone is treated with dignity, respect and professional courtesy.

Health and safety
The arrangements for meeting the University’s health and safety objectives are contained in the Birmingham City University Health and Safety Policy. This includes the responsibilities of key staff and procedures covering the main activities of the University.

All staff are expected to take reasonable care of themselves and those that may be affected by their actions.

Dress code
The University does not operate a formal dress code for its employees, other than for those who are provided with uniform and/or protective clothing. However, employees must ensure that their dress is professional, reasonably smart, and appropriate for the situation in which they are working. All staff should ensure that they present a professional image and one that reflects sensitivity to customer perceptions. This may reflect their ethnicity and lifestyle, but should not be provocative or cause offence to those with whom they have contact.

Citizenship
All staff are expected to adhere to good citizenship, being generous with help and support to others, collaborating with colleagues and working for the benefit of the University as a whole. In particular working to provide student experience and achieving excellence in all the University’s activities.