Position Description

Title: Senior Data Engineer
Faculty/Office: Information Technology
Department/Team: Business Intelligence & Reporting
HEW Level: HEW 9
Position Number:
Date: December 2019

Position Purpose: To develop and optimise data and analytics architecture, as well as optimising data flow and collection to deliver integrated and quality business information and reporting solutions.

ORGANISATIONAL CONTEXT

Macquarie University Information Technology embraces the university mission to be bold, distinctive, progressive and transformational.

Information Technology is a trusted business partner with an ethos of service but not subservience, and we pride ourselves in the application of a strong collaborative partnership approach to transformation across the University.

We strive for the efficient provision of commoditised services in order to better support the areas where we should be unique across the education, research and health portfolios within the University.

Business Intelligence and Reporting within Information Technology leads the implementation of the University-wide information strategy including data governance and data policy development. Business Intelligence and Reporting also provides enterprise business intelligence and reporting capability and analytics.

The Senior Data Engineer develop, implement and maintain data pipelines and data models with workflow tools, delivering solutions to complex technical and reporting issues to enable the business to make informed decisions.
### KEY ACCOUNTABILITIES

- Develop, test and maintain data and analytics architecture, including databases and large-scale processing systems, for optimal extraction, transformation and upload of data from multiple sources and different technologies.
- Work with the stakeholders to support their data infrastructure requirements and assist with resolving technical issues.
- Write, test and validate data transformation and ETL routines within Apache Airflow, Python, Alteryx.
- Experience in pipeline scalability, through services such as Kubernetes.
- Deploy models into production using CI/CD pipelines.
- Reverse and forward engineer data assets.
- Build data acquisition, ingestion pipeline, and data lake capability.
- Recommend improvements to data reliability, efficiency, and quality, and provide high quality data assets for enterprise use.
- Identify, design and implement process improvement to automate processes, optimise data delivery, and achieve infrastructure efficiency and scalability.
- Collate, process, transform, and model raw data from multiple sources, and utilise different data sourcing, integration and modelling techniques.
- Pilot, demonstrate and evaluate usability of new technologies and systems.
- Design and update user guides, technical specifications and proficiency documents for all applications and tools.
- Be the subject matter expert for key source system tables and data engineering tools.
- Comply with relevant EEO and WHS regulations.
- Perform any other duties as required and as appropriate for the incumbent’s HEW level.

### POSITION CONTEXT

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<thead>
<tr>
<th>Reports to:</th>
<th>Director, Business Intelligence &amp; Reporting</th>
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| Positions Reporting to: | Direct: Two  
Indirect: nil |
| Key Direct Clients: | • Executive Group  
• Senior Managers  
• Key information users across the University  
• IT  
• BI&R staff members  
• Particular staff members in other offices or faculties/departments |
| Other Key Relationships: | • External Vendors  
• Other staff members in other office or faculties/departments |
| Budget Accountability: | nil |
| Role-specific Conditions: | Criminal History Check |
| Scope and autonomy | Develops and/or modifies programs, processes, systems and/or policies that may impact University-wide projects, process improvements and/or initiatives. |
| Problem-solving | Draws on own knowledge, experience and expertise to identify, develop and implement new initiatives, processes and programs. |
## CAPABILITY FRAMEWORK
Capability Frameworks describe the behaviours, skills, attributes and experience required to successfully perform a position or group of similar positions.

<table>
<thead>
<tr>
<th>COMPETENCIES</th>
<th>ATTRIBUTES</th>
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<tbody>
<tr>
<td><strong>Planning and Execution</strong>: Managing time and resources to complete tasks and achieve objectives.</td>
<td><strong>Perseverance</strong>: Persevering despite obstacles to ensure tasks are completed.</td>
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<td><strong>Quality Focus</strong>: Ensuring accuracy and quality when completing tasks.</td>
<td><strong>Flexibility</strong>: Responding effectively to unexpected or changing circumstances.</td>
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<td><strong>Communication</strong>: Effectively articulates key messages, both verbally and in writing, adapting to suit context and audience.</td>
<td><strong>Reliability</strong>: Meeting commitments and responsibilities.</td>
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<td><strong>Service Focus</strong>: Making students, staff, alumni and other key contacts and their needs a priority.</td>
<td><strong>Interpersonal Impact</strong>: Making a positive impression on others in a range of interpersonal contexts.</td>
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<td><strong>Relationship Management</strong>: Establishing effective working relationships with others.</td>
<td><strong>Resilience</strong>: Dealing effectively with and recovering quickly from setbacks or pressure.</td>
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<td><strong>Teamwork</strong>: Working in collaboration with others to achieve shared goals.</td>
<td><strong>Accountability</strong>: Assuming responsibility for making decisions and delivering agreed outcomes.</td>
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<td><strong>Implementing Systems</strong>: Adopting a systematic and organised approach, and developing and utilising guidelines and procedures.</td>
<td><strong>Integrity</strong>: Maintaining confidentiality, discretion and professionalism.</td>
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<td><strong>Setting Expectations</strong>: Stating clearly what is expected from others, clearly expressing ideas, and maintaining a precise and constant flow of information.</td>
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<td><strong>Tracking Performance</strong>: Taking nothing for granted and persistently monitoring the progress of activities to ensure they are completed on time.</td>
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<td><strong>Delivering Outcomes</strong>: Holding self and others accountable for achieving high quality and solution focused outcomes.</td>
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### REQUIRED KNOWLEDGE

Qualifications, technical and/or professional skills and information needed from day one for successful performance.

- A degree, or equivalent experience, in computing science, software, quantitative, or related discipline.
- Knowledge of data databases, operating systems, current internet technologies and reporting toolsets.
- Knowledge of Business Information tools such as Tableau, Apache Superset or Power BI.
- Strong understanding of BI data structures and how to optimise data delivery for different BI Reporting tools
- Expertise in SQL, SQL tuning, schema design, Python, Kubernetes.
- Advanced knowledge and skills in Python, Apache Airflow, R, ETL and integration.
- Knowledge and experience with software engineering principals.

### ACQUIRED KNOWLEDGE

Organisational and/or professional skills and information to be developed within the first 3 to 6 months in the role for successful performance.

- Knowledge of the Office of Business Intelligence & Reporting’s functions and structure.
- Knowledge of the Office of Business Intelligence & Reporting’s policies, systems, processes and procedures.
- Knowledge of what other areas of the University do and how they interact with the Office of Business Intelligence & Reporting.
- Knowledge of the University’s business intelligence and reporting structure, systems, processes and procedure.

### KEY EXPERIENCES

Practical experiences and exposure to specific environments or activities related to successful performance.

- Demonstrated experience in developing, implementing and maintaining data pipelines and data models with workflow tools such as Airflow, Oozie or Luigi.
- Demonstrated experience in delivering solutions to complex technical and reporting issues, and defining business requirements and translating these to reporting solutions to enable the business to make informed decisions.
- Extensive experience in analysing, modeling and interpreting large and complex data, with the ability to integrate data from multiple sources and technologies.
- Experience with cloud infrastructure, and working within a Lean Engineering Agile Environment.
- Solid experience in building RESTful APIs and microservices, e.g. with Flask.
- Experience with solution building and architecting with public cloud offerings Azure, AWS and Google for services such as S3, Blob, BigQuery, SQL DB, Data Lake, Cosmo DB, Batch, Kubernetes and Data Factory
- Managing and prioritising multiple work demands to deliver milestones that meet project deadlines.
- Communicating report results and data interpretation to clients with varying levels of understanding of data/report analysis.