

SQL Test Automation

Aditya Raj • Bachelor of ICT • Ara Institute of Canterbury Ltd
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The Project

The tutors of the Department of Business and Digital Technologies at Ara Institute of Canterbury are the industry clients of this project. The targeted users of this project outcome are tutors of SQL Server databases courses at the organisation.

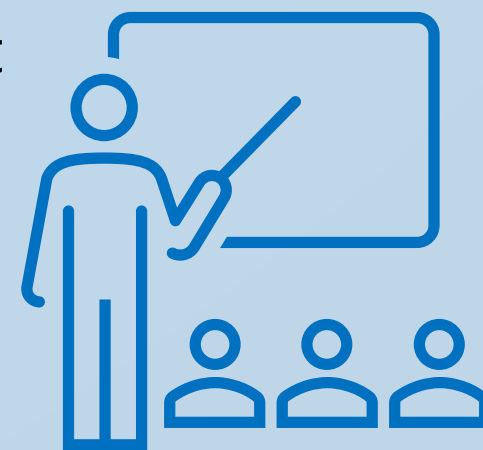


Project Aim



The aim of this project has been to deploy a product that allows students in database courses at Ara to submit their SQL Server language code work and get automated marks and feedback quickly.

This is important to the industry clients because using this product they will be able to save many weeks not having to manually download all their students work to execute and manually mark and provide feedback, also their students will not have to wait many weeks to get their marks and feedback returned, therefore time is saved, and manual work is automated.



Project Requirements

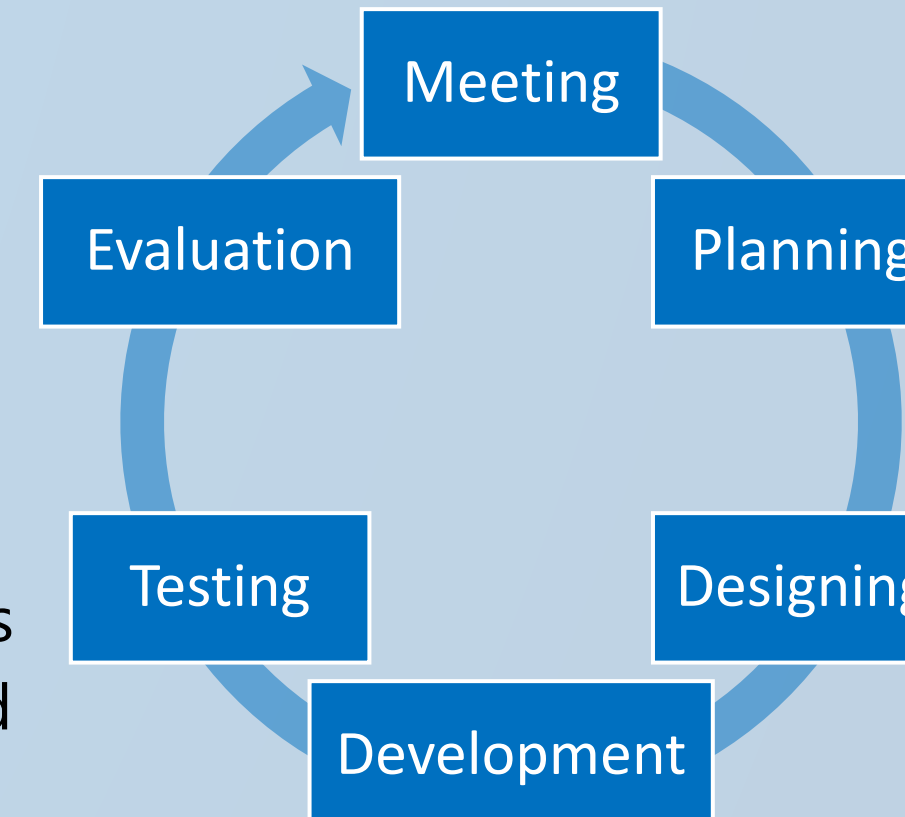
- + Support for Microsoft SQL Server 2017 and 2019
- + Deployed to Ara Computer Labs used for Database Courses
- + Compare Student Answers with Tutors Model Answer
- + Automatically Bulk Mark All Students Work
- + Provide Results and Feedback for Student Answers

The Process

The project made use of the Agile methodology with the Scrum framework in which each sprint consisted of the six phases of the software development process.

Meetings involved discussion of goals, requirements, and outcomes for the sprint including a show and tell from the previous sprint.

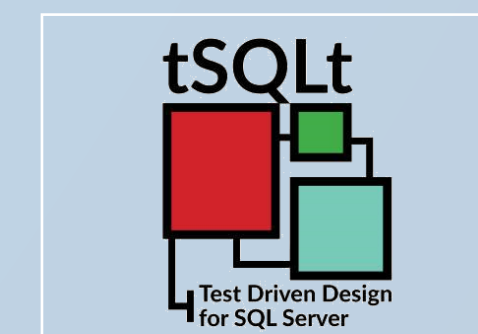
Manual testing was done while coding the product throughout the development phase, it was also tested by my industry supervisors during our sprint meetings which also involved the evaluation of the product for the next steps. The design and development phases involved the below tools and technologies.



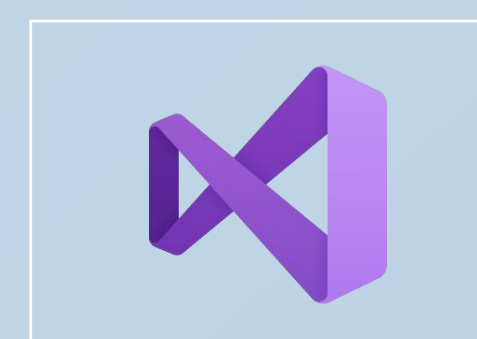
Microsoft SQL Server 2017/2019



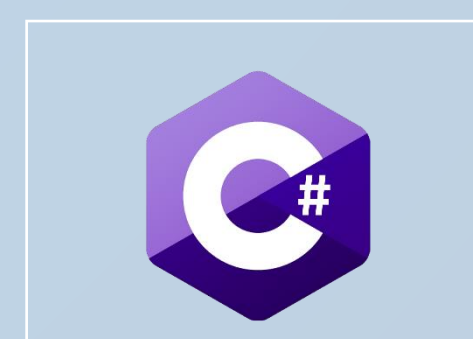
SQL Server Management Studio



tSQLt Database Unit Testing Framework



Microsoft Visual Studio 2019



Microsoft C# Language



Microsoft .NET Framework

Issues Found

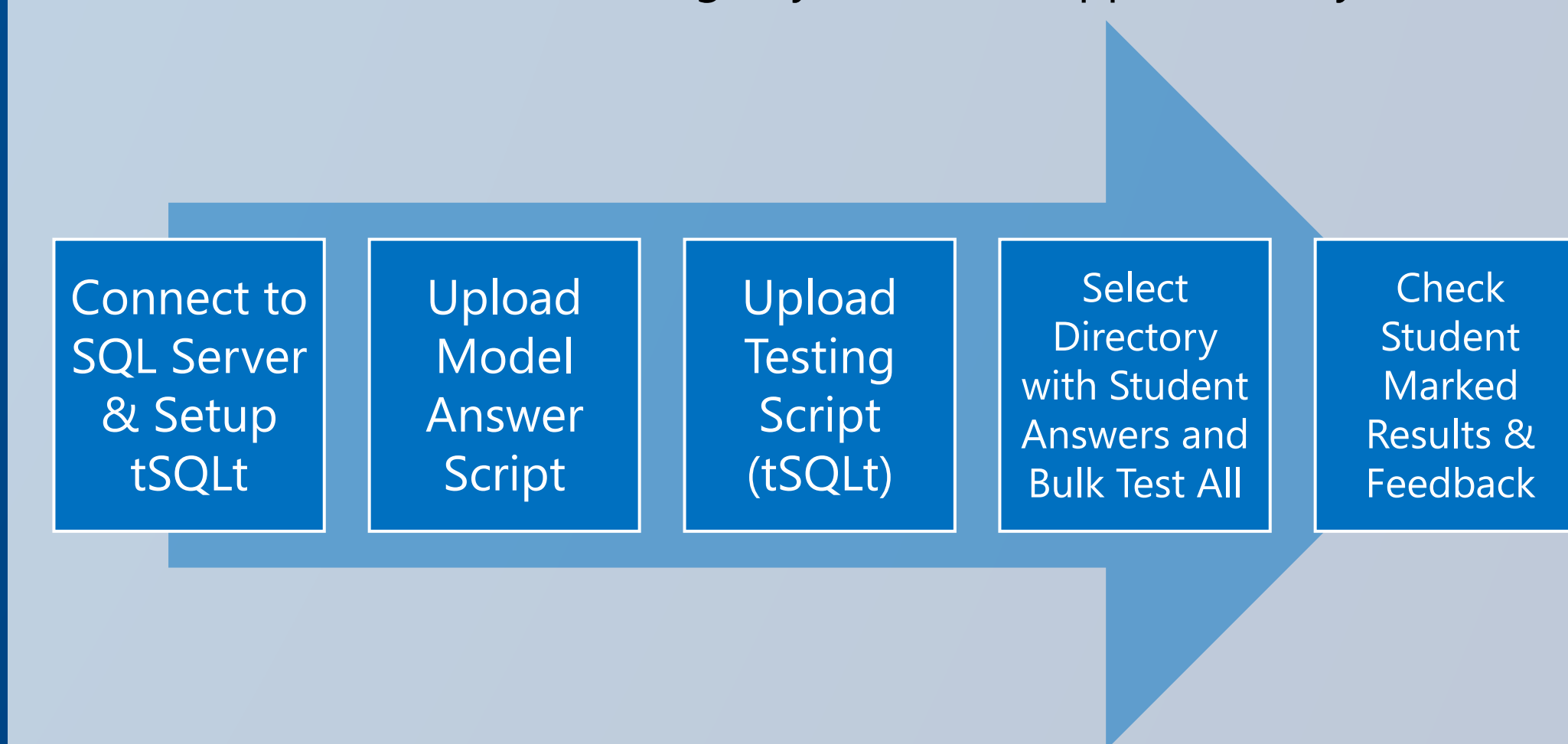


- o Understanding how to use tSQLt with SQL Server.
- o Understanding the implementation of SQL Server with C# .NET Framework and working with SQL files.
- o Deploying the final products to Ara computers with security firewall and permissions restrictions.

The Outcome

The SQL Test Automation program serves to automate the bulk marking of SQL Server practical tests done by the students of database courses at Ara Institute of Canterbury.

This program has been developed to speed up the marking process for tutors of SQL Server database courses in which student work is marked automatically and instantly, not only reducing time and manual work for tutors, but students also benefit by receiving their results much faster. This program reduces the time taken to mark a class of 25 students work from 10 working days, down to approximately 1 minute.



Learning Outcomes

Industry Learnings	Project Management
<ul style="list-style-type: none">✓ Understanding of tSQLt Database Unit Testing Framework.✓ Implementing SQL Server with C# and .NET Framework (Visual Studio 2019).✓ Use of Agile Methodology with Scrum Framework.✓ Implementation of the Software Development process.✓ Packaging and deploying portable Windows program.	<ul style="list-style-type: none">✓ Project Planning - Goals, Benefits, Requirements, Deliverables/Outcomes)✓ Time Management – Phases, Timetable, Burndown Charts, Meeting Deadlines.✓ Risk Management – Consequences, Exposure Measurements, Mitigation Strategy, Contingency, Triggers.✓ Quality Assurance – Test Plan, Code Validation and Formatting✓ Communication & Teamwork.

