

# Regression Test Suite

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## ABSTRACT

Testing is the process of analysing a system or its component(s) to determine if it meets the required specifications or not. Briefly stated, testing is the process of putting a system through its phases to find any defects, errors, or requirements that are missing from the actual requirements. A test case is a set of activities performed on a system to determine whether it complies with software requirements and functions as intended. The project's objective was to help Sustainability 360 create a suite of test cases, find problems, and defects, and have a faster and more efficient deployment. By utilising the Agile methodology with Scrum, Azure DevOps and Black Box Testing, a suite of test cases was successfully delivered, and defects identified.

**Keywords:** Software Testing, Agile Methodology, Scrum Framework, Test Cases

## 1. INTRODUCTION

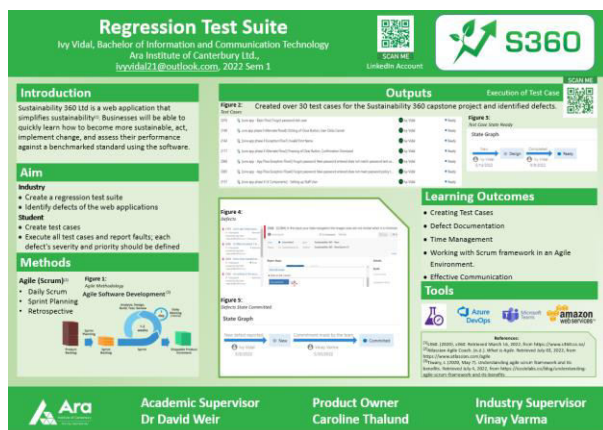
Sustainability 360 Ltd is a web application that simplifies sustainability. Businesses will be able to quickly learn how to become more sustainable, act, implement change, and assess their performance against a benchmarked standard using the software (s360, 2020).

Sustainability 360 is located at Ara Institute of Canterbury's Te Ōhaka, a start-up incubator. They are dedicated to assisting in the development of business solutions that make sustainability simple, accessible, and straightforward.

The paper provides an overview of the project's methodology, process, outcomes, and conclusions.

**Figure 1:**

*Regression Test Suite Poster*



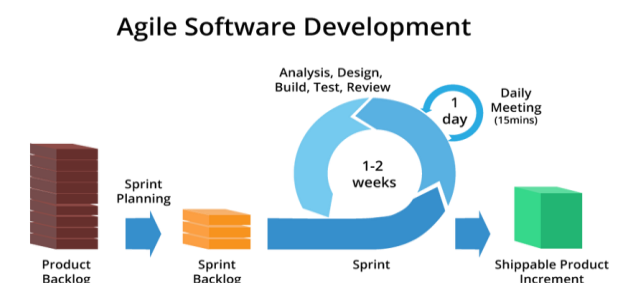
The agile methodology is a project management approach that includes breaking down processes and projects into smaller, more manageable components or stages. Agile teams break down their projects into separate modules, which they test and improve before moving on (Software Testing Help, 2022).

Scrum is a framework that allows teams to tackle complicated problems while also accomplishing tasks. Even though the problem is complex, the quality of the deliverable must be excellent. When a problem is complex, effective team collaboration is required. Although scrum is a simple and easy-to-understand methodology, mastering it may be difficult (Testim, 2019).

A Scrum team is a small group of people who collaborate on a deliverable goal every sprint (typically one- to four-week periods). A sprint's work in software development is an incremental improvement that helps meet a user or product requirement.

**Figure 2:**

*Agile Methodology Process*



(Tiwary, 2020)

## 2. METHODOLOGY

The project is implemented with Sustainability 360 using the Scrum framework and Agile methodology as core elements throughout the project's duration.

### 3. PROCESS

This section outlines the steps used throughout the project to ensure the outcomes were successfully delivered.

#### 4.1 Project Management

The project was conducted in sprints of 1 to 2 weeks durations with Microsoft Teams primarily used to facilitate team collaboration with online meetings. Sprint planning occurred at the start of the sprint and a daily standup meeting occurred where we discussed what we did yesterday, what we plan to do today, and what is blocking our way. This allows us to see what everyone is up to and where we're headed. It also helps to prevent procrastination and increase attention to the goal we discussed in the meeting. They can assist us with our progress barriers and determine if we are on the right track for our supervisor. At the conclusion of each sprint, a review of the progress was conducted.

Software testing is the practice of examining the functionality of a software application to find any defects. To deliver a quality product, it analyses if the generated software meets the set standards and discovers any problems in the software.

Black Box Testing involves testing the functions of software applications without knowing the internal program code, implementation details, or internal methods. Black Box Testing is a type of software testing that concentrates on the input and output of software applications and is completely based on product requirement specifications. It's also known as behavioural testing (Hamilton, 2022). Throughout each iteration, black box testing was performed

During each scrum iteration, the author created test cases using Azure DevOps to outline how a system, product, or application should be tested. A test case was a single set of instructions that a tester must complete to confirm the functionality of a particular feature of a product or application. The goal of a test case was to ascertain whether different system features performed as expected and to verify that the system conforms with all industry standards, requirements, and user needs. The process of developing a test case also helped in identifying software defects or problems. Any product defects were reported through Test & Feedback.

#### 3.1 Quality Assurance

Quality assurance ensures that project procedures were followed to create high-quality deliverables. It involves adhering to and exceeding standards, enhancing project work constantly, and eliminating project defects.

The Quality Assurance method used in this project is based on a model described by Virginia Tech. The deliverables are the components that are expected to be completed by the end of the project. The development phase is when the deliverables are to be completed. The success criteria serve as a reference point against which the deliverable will be judged. After the deliverables have been examined and accepted, the person responsible will sign them off (Virginia Tech, n.d.).

### 3.2 Risk Assessment

Risk management was conducted to help in discovering, analyzing, and controlling hazards so that negative consequences are reduced, and the project's potential is maximized. The first stage is to determine whether there are any project hazards.

Based on the Microsoft risk assessment template, the author developed a risk management table for the project. Every week, it was evaluated and modified to reflect quickly changing conditions. To enable monitoring and comparison, these versions were kept in an excel spreadsheet.

It allowed us to think about the main features of the risks and evaluate them depending on their probability and potential impact. (Microsoft Corporation, 2002).

### 4. OUTCOME

The learning outcomes are outlined in the following categories in this section.

#### Professional

- Agile Methodology with Scrum
- Effective Communication
- Risk Management
- Project Planning
- Quality Assurance
- Academic Documentation

#### Technical

- Creating Test Cases
- Execution of Test Cases
- Identifying Defects
- Defect Documentation
- Test Cases Review

### 5. CONCLUSION

The author successfully delivered more than 30 test cases for Sustainability360 and identified defects in their product. They have gained real-life work experience using the Agile Methodology and Scrum Framework and enhanced their professional communication skills. They successfully applied Project Management, Quality Assurance and Risk Management processes to overcome COVID-19 difficulties experienced during the project's duration.

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