Agile Web Application Development Report

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# Collaborative development

The project uses Agile methods by focusing on incremental development using Git technology. As a sole developer, collaborative peer reviews weren’t relevant. But Git branches compartmentalise the functionality of the application. Allowing for multiple features to be worked on simultaneously in isolation, reduces conflicts when integrating (Gowda, P, 2022).

Git diff and pull requests are used for proofreading and visually displaying all changes. An example branch is add-bootstrap. Isolation of this design work separated styling and backend work, ensuring logic-based features would not be interfered with. This follows the Agile methodology by delivering adaptable functionality in isolation.

Branched workflows can showcase prototypes with isolation of functionality (Appendix, figure 1). Allowing faster feedback and approval of new concepts, reducing instances of wasted work when requirements change. Regular demonstrations can ensure alignment with end-user expectations (Atlassian, n.d). Technical implementation requires a workflow\_dispatch to run a specific branch of work (GitHub Docs, 2024).

A future workflow improvement is continuous integration (CI). A CI pipeline would automate tests on each commit. Even as a sole developer this practice forms smoother collaboration and increases the reliability of the project and development and the codebase grows (Crudu and MoldStud Research Team, 2024)*.*

# Class Based Views

Implementing Django’s class-based views (CBVs) facilitates reusable code, faster development and better organisation of functionality. This aligns with Agile development principles (Horilla Editorial Team, 2024).

CBV encapsulates logic for HTTP methods such as GET, POST, PATCH and DELETE requests, for create, read, update and delete (CRUD) requirements. This can be reused for faster reliable development (AlOmar et al., 2021).

CBVs enable better extensibility and maintainability to support an Agile adaptive workflow (Agarwal & Majumdar, 2013). For example, during late-stage development, non-admin user restriction for the user index page was implemented by simply adding SuperUserRequiredMixin (Appendix, figure 2) to the UserIndexView parameters. Another example, quickly adapting default class behaviour is simple. In this project, configuring bug date order only required overwriting BugListView’s get\_queryset (Appendix, figure 3) method (Django Software Foundation, 2025).

CBV reduces code bloat and improves readability due to the separation of concerns. The model, templates and URLs have specific roles defined in each Class. For example, BugListView inherits from Django’s ListView, to access all instances of the Bug model. No additional logic is needed.

# Test Driven Development (TDD)

Writing tests before code implementation ensures the business requirements are defined (James. C, 2024). Ideal in Agile workflows, as the test will redefine the business's requirements, so the implementation code must satisfy this before a production release is possible.

Tests first can also highlight missed specification issues and pre-existing coding oversights when integrating into the existing application. The user story may require a change to the code that breaches the scope of what is possible in a sprint.

TDD in this project, for example, was used to ensure normal users could not delete a bug. If the business required a change, the test would reflect this first. The test expectations ensure a minimal amount of application code is needed, which prevents feature creep and focuses development. This speeds up adaptation by having to change less code (Conformiq, 2023).

Test expectations also perform a documentation role (Siniaalto & Abrahamsson, 2017). Useful for retrospectively understanding the code's purpose and for collaboration, speeding up the response to change. Even developing solo, TDD’s red-green-refactor process supports iterative design and efficient coding.

Appendix

figure 1

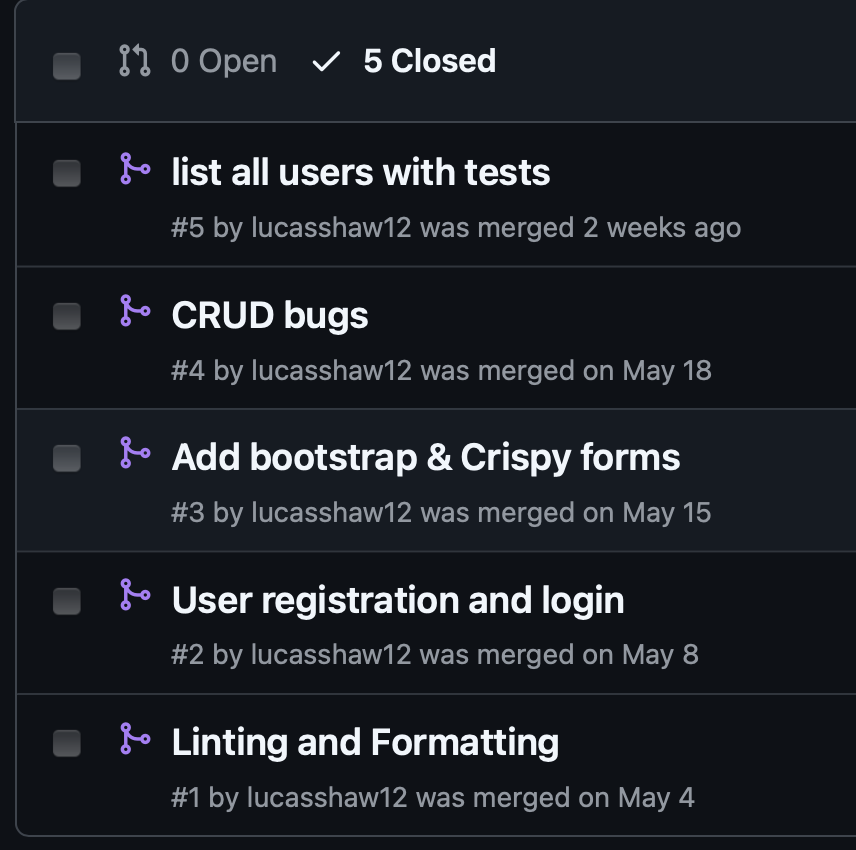
https://github.com/lucasshaw12/bug\_tracker/pulls?q=is:pr+is:closed

figure 2

https://github.com/lucasshaw12/bug\_tracker/blob/6fe6479cc2dae4dda4cb1525b99fd17e9604bc0a/accounts/mixins/custom\_mixins.py#L5

from django.contrib.auth.mixins import UserPassesTestMixin

from django.contrib.auth.views import redirect\_to\_login

class SuperUserRequiredMixin(UserPassesTestMixin):

def test\_func(self):

return self.request.user.is\_superuser

def handle\_no\_permission(self):

return redirect\_to\_login(self.request.get\_full\_path())

figure 3

https://github.com/lucasshaw12/bug\_tracker/blob/6fe6479cc2dae4dda4cb1525b99fd17e9604bc0a/bug\_tracker/views.py#L13

class BugListView(LoginRequiredMixin, ListView):

model = Bug

template\_name = "dashboard.html"

login\_url = reverse\_lazy("login")

def get\_queryset(self):

return Bug.objects.order\_by("date\_raised")

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