PHOLISA NOFEMELE
ST10081751

PROG7311 POE

Contents

Section 1

PART 1:

Avoid repeating of patterns, provide the implementation in the design. Make sure that the design patterns are understood in order for the pattern to be implemented effectively on the prototype. Ensure that the explanations that are provided do not have missing details, provide all the necessary details. The patterns explanation needs to be more detailed.

PART 2:

To optimise the performance of the prototype a few changes will be made, such as changing the type of database that was used. The database that was used was the Azure Database, which was mainly used to ensure that placing and accessing the data will be easy. Issues were encountered with the database hence why it will be altered, in order to ensure that there will not be issues that will be encountered in the future. All functionalities that were used in the project could not be tested, these functions will be looked at to see why the functions could not be tested and what needs to be done to ensure that the functions can be tested.
Allowing the employee or farmer to log in to the website, add new products in the database, and view a list of all the products, and the filter option function, all these functions will be optimised to work with no bugs detected.
The user interface will be worked on to ensure that there is consistent styling applied across all the pages. Consistent naming conventions and coding standards will be applied throughout.

Section 2

A **software development methodology** is a framework that is responsible for structuring, planning, and controlling the process of developing an information system. Within the software development process, the only concern is that no technical aspects are involved but proper planning for the software development lifecycle is demanded by the development organization (The IIE, 2018).

The software development methodology that I would recommend is **Scrum**.
Reasons for recommending Scrum are as follows:
Scrum is a methodology that is **adaptive, iterative, quick, flexible and it is effective** (Scrum, 2022). Scrum is designed for delivering significant value very fast and throughout the project. This methodology ensures **transparency** during communication and creates an environment that is **collective accountability** and **continuous progress** (Scrum, 2022).
Scrum is **structured** to ensure that product and service development in all types of industries is supported by it, regardless of the complexity (Scrum, 2022). Since this project deals with product development and ensuring that products are delivered to customers, scrum suits the project best. Scrum is very accommodating as it **supports product and service development in all the different industries**.

Scrum **prioritises the product owner** because the product owner plays an important role. The product owner is the one who defines and prioritises the **business requirement**, which gives developers the room to be able to satisfy the needs of the business owner because they have an idea of the requirements and what is expected of them. Knowing the requirements of the product owner also allows the developers to recommend what is best for the project and tell the product owner exactly what they need to implement to bring the ideas to life.

Scrum is used for cross-functional, self-organised, and teams who divide their work into more manageable and shorter, and work cycles are concentrated (Scrum, 2022).
Scrum allows different work to be done simultaneously, which allows work to be done **quickly and reduces the workload**. There are sprints which is a period of time of development, which can take two to six weeks. During a sprint, there is a stand-up meeting where **progress is reported by the team**. These meetings allow there to be constant communication which makes working on the project smoothly. At the end of each sprint, there is a review meeting which consists of the system's demonstration to the product owner, and it is **accepted if the criteria are met**.

Constant **communication** through sprints with the product owner ensures that the requirements are met, and it avoids ending up with a website that the owner is not happy about (The IIE, 2018). It allows the owner to be part of the project which avoids a lot of things, such as misunderstandings, misinterpretations, and conflict. Constant communication with the product owner allows the owner to be able to under the process more. This also allows flexibility and adaptability to be achieved (The IIE, 2018).

The last meeting is where the team members ask themselves, the following questions:

- What worked well?
- What did not work well?
-

These questions are asked with regard to the sprint. This gives the team members room to change things for improvement.
Other stakeholders provide feedback early in the project development stage, the feedback is often provided. This ensures that the **team accommodates all the stakeholders**, and that specific requirements and expectations are met.

Involving stakeholders allows the developers to keep the **user experience** in mind and make sure the user experience is also a priority, constant feedback leaves room for the user experience to be refined. This results in a website that is intuitive and efficient for the users that are intended (The IIE, 2018).

Section 3

DevOps is when a company's application development and systems operation **team's tasks** are **blended**. In DevOps, the goal is to bring development and operations closer together so that the same team handles both development and deployment. These deployments are typically automated as much as possible (The IIE, 2018).

Goals of DevOps:

- More frequent software deployment.
- Decrease the time for new products to be marketed.
- Success rate of new releases is improved.
- Turnaround time on bug fixes is improved.
- More quick recovery from failure.

I would recommend DevOps, and it does fit with the **Scrum software development methodology**.

DevOps is used for teamwork purposes to ensure that work is shared among team members, and Scrum consists of a team who divides their work to be more manageable. DevOps and Scrum both involve **collaboration, communication, constant monitoring, and feedback**, which is why they fit together. DevOps gives Scrum the platform to be able to collaborate and ensure that there is an environment that makes the development process efficient. DevOps enhances the development process.

DevOps has three levels to it, namely: Continuous Integration, Continuous Delivery and Continuous Deployment.

Continuous Integration (CI) is a practice for development that requires developers to integrate code into a shared repository multiple times a day. Every check-in is verified by a build that is automated, which allows early detection of problems (The IIE, 2018).

Continuous Delivery is the ability securely and quickly get all kinds of changes, such as new features, configuration alterations, bug fixes and experiments into production or into the hands of users in a way that is sustainable (The IIE, 2018).

In continuous delivery, there is more automation and testing are added in order to make sure that the code that is being built is ready to deploy at all times. This does not intend that every change is deployed immediately (The IIE, 2018).

Continuous Deployment is when the software that is built is deployed to an environment that is live with no manual steps included.

The reason for recommending DevOps is because of the following reasons:

- The shortened time to market new products allows there for the delivery of software to be faster due to continuous integration, continuous delivery, and continuous deployment. Using DevOps shortens the development cycle.

- The two levels (continuous integration and continuous deployment) will deliver a website that is of high quality and a website that is reliable. The two levels mentioned ensure that the team can be able to detect problems quickly and solve the problems quickly. This promotes the stability of the website because deployment **failures are reduced, and the recovery time is faster**.
- DevOps ensures that the **collaboration and communication between team members are improved**, using the necessary tools. The collaboration results in there being a better understanding of goals, boosts **transparency in communication** and introduces a more effective way of solving problems (The IIE, 2018).

DevOps has multiple benefits to the project.

Section 4

Enterprise Architecture (EA) is an architecture that is designed to discipline enterprises that are leading proactively and holistically responding to disruptive forces by identifying and analysing the execution of change towards the requirements of the business vision and outcomes. Value is delivered by EA by a business being represented and IT leaders who consist of signature-ready recommendations for adjusting policies and projects that will help achieve business outcomes that are targeted that capitalize on business disruptions that are relevant (The IIE, 2018).

Enterprise Architecture aims to integrate the often-fragmented legacy of processes (both manual and automated) across the enterprise into an environment that is responsive to change and supportive of the delivery of the business strategy. In other words, it is a way to optimize

the enterprise by creating an integrated environment that can adapt to changes and support the delivery of business strategy (The IIE, 2018).

The enterprise architecture has three different frameworks and methodologies:

- **Information Technology Infrastructure Library (ITIL)** is a framework that is responsible for managing services of IT throughout its entire life cycle (The IIE, 2018).
- **The Open Group Architecture Framework (TOGAF)** is a framework that is known to describe a methodology for describing the architecture of an enterprise (The IIE, 2018).
- **Zachman Framework** is a way that is structured for describing an enterprise (The IIE, 2018).

I would recommend a combination of **TOGAF** and **Zachman Framework** because of the following reasons:

Using TOGAF will result in the Enterprise Architecture being **consistent, the needs of stakeholders being reflected, best practices being employed, and due consideration being given to both current requirements and the future needs of the business perception** (TOGAF, 2022). The development and sustainability of an Enterprise Architecture is a process that is technically complex and involves numerous stakeholders and decision processes within the organisation (TOGAF, 2022). TOGAF plays an important role in ensuring that the architecture development process is standardized and de-risked. This framework provides best practices for adding value and allows the organisation to build solutions that are workable and economical and address the issues and needs of a business (TOGAF, 2022).

TOGAF prioritises stakeholder management and engagement in the entire development process just like Scrum does (TOGAF, 2022). Through the use of TOGAF, the team gets feedback from stakeholders, the input is gathered, and the concerns are addressed.

TOGAF benefits organisations that undertake, or **plan to undertake**, the development and implementation of an Enterprise Architecture for supporting a business transformation (TOGAF, 2022). This is what Farmer's Central is a part of, it plans on undertaking the development and implementation of the Enterprise Architecture.

Based on the information accumulated, TOGAF aligns well with the requirements as well as the aim of the project. The TOGAF provides an **approach that comprehensive** to the design, planning, and implementation of enterprise architecture.

The **Zachman Framework** will be used as a template or framework to fill in, which will the process clear and easy to understand (The IIE, 2018).

Section 5

In the prototype, an **Integrated Development Environment (IDE)** was used. IDE is like the ground on which a house is built. There are multiple types of IDE, the one used in the prototype is **Visual Studio**. The code is basically like bricks, wood, cement, and any equipment that is used to create a house and predict the functions that certain parts of the house will play. Bugs in the code are like plumbing leaks etc. This is just an example. **C#** is the language that was used to code.

Website

Code

Figure 1: Microsoft Bing

Bugs etc.

ASP.NET Web Application (.NET Framework) is used, ASP.NET is cross-platform (Microsoft, 2022), which means it is a product that has the ability to work across numerous kinds of platforms or operating environments, ASP.NET enables one to develop and deploy apps on an operating system. ASP.NET Web application is particularly for web applications (Microsoft, 2022).

.NET Framework is used, .NET Framework is used for building any type of app that can run on Windows only (Microsoft, 2022).

.NET Framework 4.8 is used, which is a version of .NET Framework.

.NET Framework 4.8 is the recommended version because it will still be relevant and useful in the future.

Model-View-Controller (MVC) is used in the prototype. MVC is a Software Architecture Pattern (GeeksforGeeks, 2022). MVC divides an application that is interactive into 3 parts:

Model: is responsible for handling data logic, and it interacts with the database (GeeksforGeeks, 2022).

View: is responsible for handling the presentation of data (GeeksforGeeks, 2022).

Controller: is responsible for handling the requests (GeeksforGeeks, 2022).

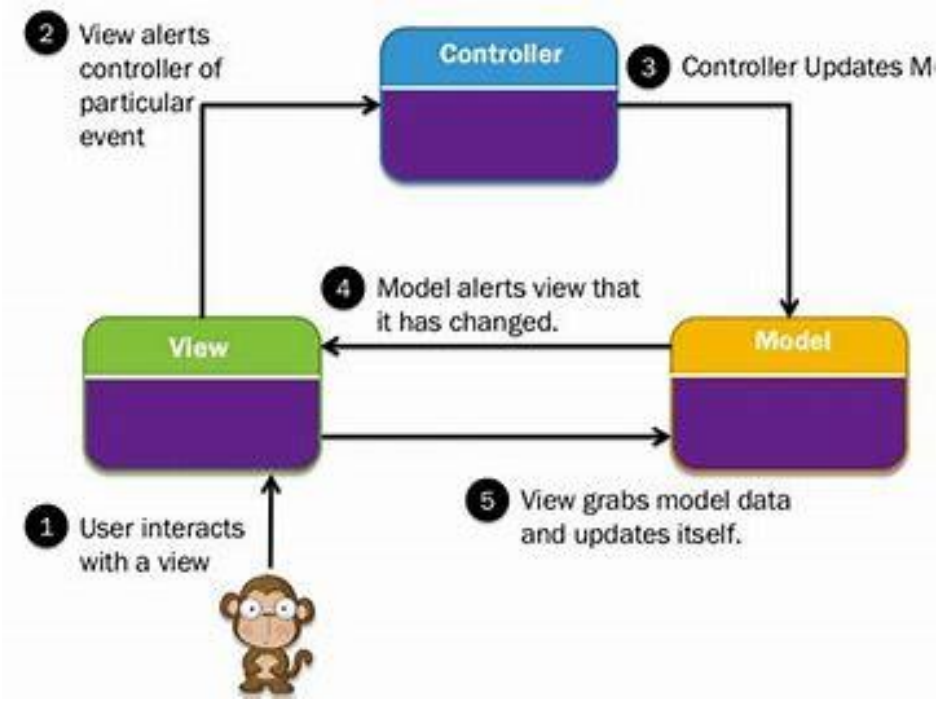

Figure 2: Martin, M

Azure SQL Database is used in the prototype, this is where data is stored and retrieved. Azure SQL Database is a cloud-based database (Microsoft, 2022), which means that it can be accessed from anywhere, at any time. Just because it is cloud-based, does not mean that

everyone has access to it, only authorized users have access to it. Like, the project manager in a team is the only one who has access, to contact detail for the client.

Figure 3: DataNumen

Reference List

Chakray. 2022.What is DecSecOps and why is it so important. [Online]. Available at: https://www.chakray.com/what-is-devsecops-why-important/ [Accessed 20 June 2023].

DataNumen. 2018. How to use generally available transactional replication for azure sql database. 29 January 2018. Available at: How to Use Generally Available Transactional Replication for Azure SQL Databases (datanumen.com) [Accessed 20 June 2023].

GeeksforGeeks. 2022.MVC Framework Introduction. [Online]. Available at: MVC Framework Introduction - GeeksforGeeks [Accessed 20 June 2023].

Martin. M, 2010. MVC framework tutorial for beginners: what is, architecture & example. Guru99. [Online]. Available at: MVC Framework Tutorial for Beginners: What is, Architecture & Example (guru99.com) [Accessed 20 June 2023].

Microsoft. 2022. AP.NET Web Apps. [Online]. Available at: ASP.NET Web Apps | HTML, CSS, JavaScript, and C# (microsoft.com) [Accessed 20 June 2023].

Microsoft Bing. 2022. Common causes of house foundation crack and break problems. [Online]. Available at: foundation of the house and the house - Bing images [Accessed 20 June 2023].

Scrum. 2022.Why Scrum. [Online]. Available at: Scrum Certification, Agile Certification | Scrum, Agile Training (scrumstudy.com) [Accessed 20 June 2023].

The Open Group. 2022. Welcome to the TOGAF® Standard, Version 9.2, a standard of The Open Group. [Online]. Available at: The TOGAF® Standard, Version 9.2 (opengroup.org) [Accessed 20 June 2023].

The IIE. 2018. Programming 3A [PROG7311 Module Manual]. The Independent Institute of Education: Unpublished.