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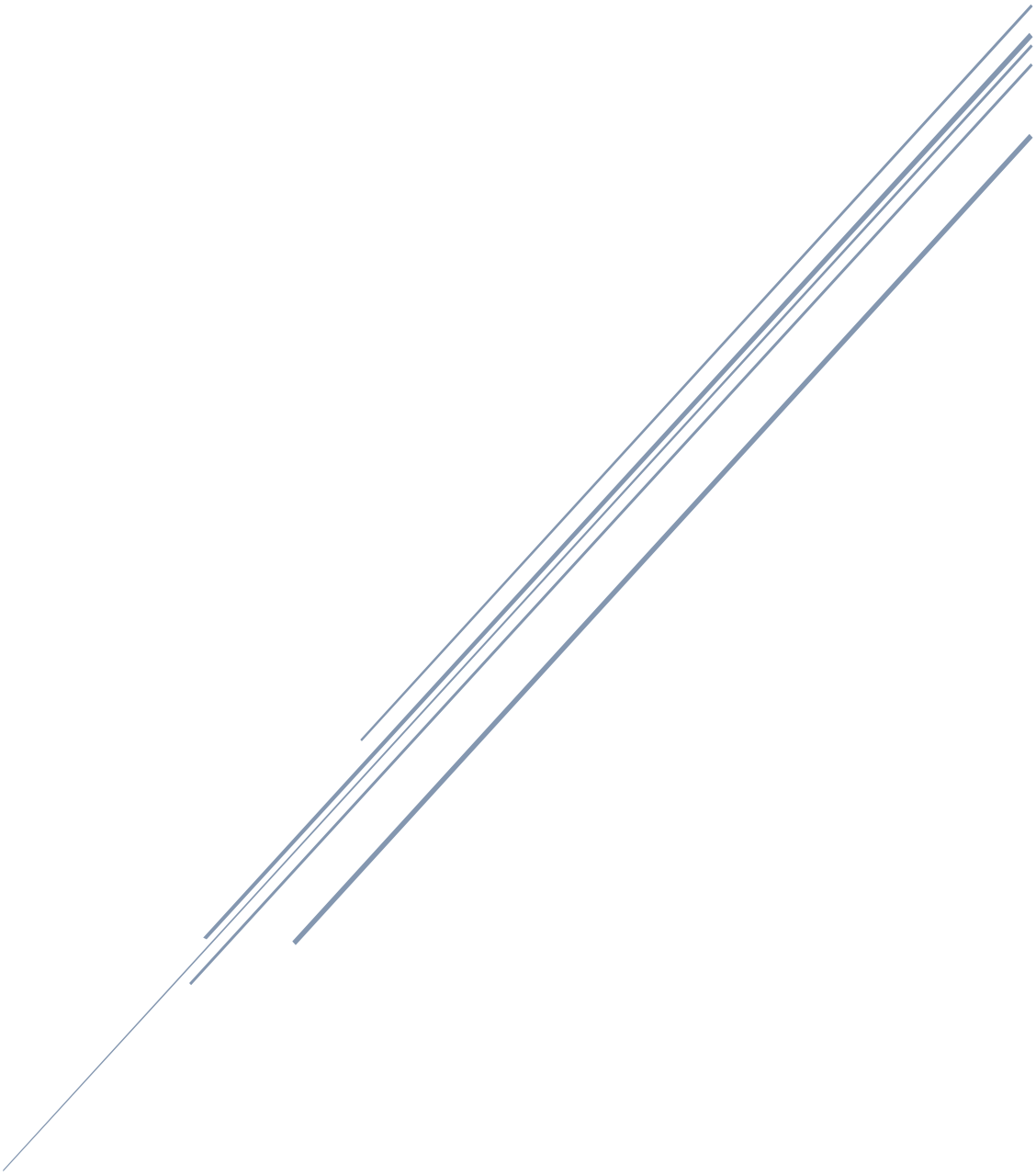
PROG7311 – POE Final



Course: BCAD Year 3 – Group 1

Due date: 23 June 2023

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Introduction

The following document will include a fully discussed and analysed report that is incorporated into the proposal document (POE Part 1). The report will include how the performance of the prototype can be optimised, which software development methodology is recommended, the implementation of DevOps, a recommended framework and a short description of the technical solution that is implemented in the prototype.

Review of POE Part 2 - Performance Optimization

Review of POE Part 2:
Overall, the prototype for Flesh Farming was decently done, and basic. The overall functionality of the website is working. The design of the website is basic. Login functionality for different users works as well as adding products. There are opportunities to improve performance by adding to the design of the website.

How can the performance of the prototype be optimized?

- The design of the website can be changed. The CSS needs to be changed in order to change the look of the website.

Guidelines to be followed when the final software is developed to ensure its acceptable performance

- The website must not lag when retrieving data for different views
- The database must be designed well and maintain referential integrity throughout its use.
- The database must be regularly monitored to maintain optimal performance.
- The code must be optimized by employing the best possible coding practices.
- The client-server communication must be optimized by decreasing the size of network requests.
- Tests must be performed regularly to ensure that the website is fully functional.
- All functions of the website should be operational at all times the website is live.

Methodology

Recommended methodology: Agile methodology

What is agile methodology?

There are different agile methodologies, such as Scrum and Kanban. Agile methodology is an approach to completing a project in which the project is broken into phases and emphasis is placed on collaboration and finding ways of improvement. Team members that use the agile methodology use sprints to perform their tasks. Sprints are short iterations in which team members produce working software by then end of each sprint. These sprints allow for feedback, ease of responding to requirements that may change and continuous improvement. Each iteration in these sprints will deliver a result that is usable to the user (Shankarmani, et al., 2012).

Strengths of agile methodology

- Time and money will be saved.
- There is not much documentation required.
- Regular feedback from the end user.
- More iteration and less defects.

How does agile methodology map to the Flesh Farming's needs?

- Flesh Farming will save time and money because the project will be completed faster based on the agility that is provided by this methodology.
- Feedback will be often received from Flesh Farming after using software that has been created for them after each sprint, this regular feedback will lead to more iterations, in which bugs will be fixed and the software is then created solely around Flesh Farming's needs.
- For e.g. a sprint has been completed to add functionality for an Employee to add Farmers to the database. This software will now be tested by an Employee and feedback will be sent to the development team. This is highly useful because this methodology advocates for ease of changing requirements, so the development team can start fixing bugs or change the requirements easily using agile.

Why is agile methodology chosen?

This methodology has been chosen because it ensures that the development team completes the project within the timeframe, as well as staying within the budget. Communication is also improved between the development team and Flesh Farming because of the feedback received after software is tested after completed sprints.

Roles and responsibilities:

- Project manager: Creates Kanban and uses Scrum based on requirements of Flesh Farming.
- Developers: Perform their tasks iteratively using sprints.
- Flesh Farming members: Test software given to them and give feedback to the development team to improve software.

Methodology (not recommended): Waterfall Methodology

What is waterfall methodology?

Waterfall methodology is an approach to completing a project that is linear and sequential. This method consists of specific phases such as, gathering the requirements, designing the proposed solution, testing, and deploying the solution. Each phase must be complete before moving onto the next, hence **sequential**.

Strengths of waterfall methodology

- The structure is clear. There is a clear pathway to the completion of a project using this methodology, requirements, design, test, and deploy.
- End goal is determined at the start. Once the requirements are gathered, it is clear what the end goal of the project is and the development team knows exactly what they are working towards.

Weaknesses of waterfall methodology

- Changes are difficult. Waterfall focuses on moving forward by ensuring that one phase of the project is complete before moving on to the next, this makes it difficult to implement changes to the project.
- No focus on the end user. Waterfall is an internal process, it solely focuses on the development team moving forward in completing the project and not much feedback is received from the end user throughout (Casteren, 2017).

Why waterfall methodology is not recommended?

Waterfall is not recommended simply because this methodology does not cater for requirements that may need to be changed. If there are unexpected changes required, a lot of time will be wasted backtracking.

DevOps

Implementing DevOps is recommended.

What is DevOps?

DevOps is a methodology is used in software development by placing emphasis on the collaboration between development and operations teams. DevOps caters for automating processes, integration to remain continuous and delivery, it allows developers to deploy code continuously using DevOps tools (Hasan, 2020).

Why is DevOps recommended?

- Collaboration is made easy between development and operations teams because they work together throughout the process of developing software.
- DevOps includes continuous integration; this allows software to be released faster.

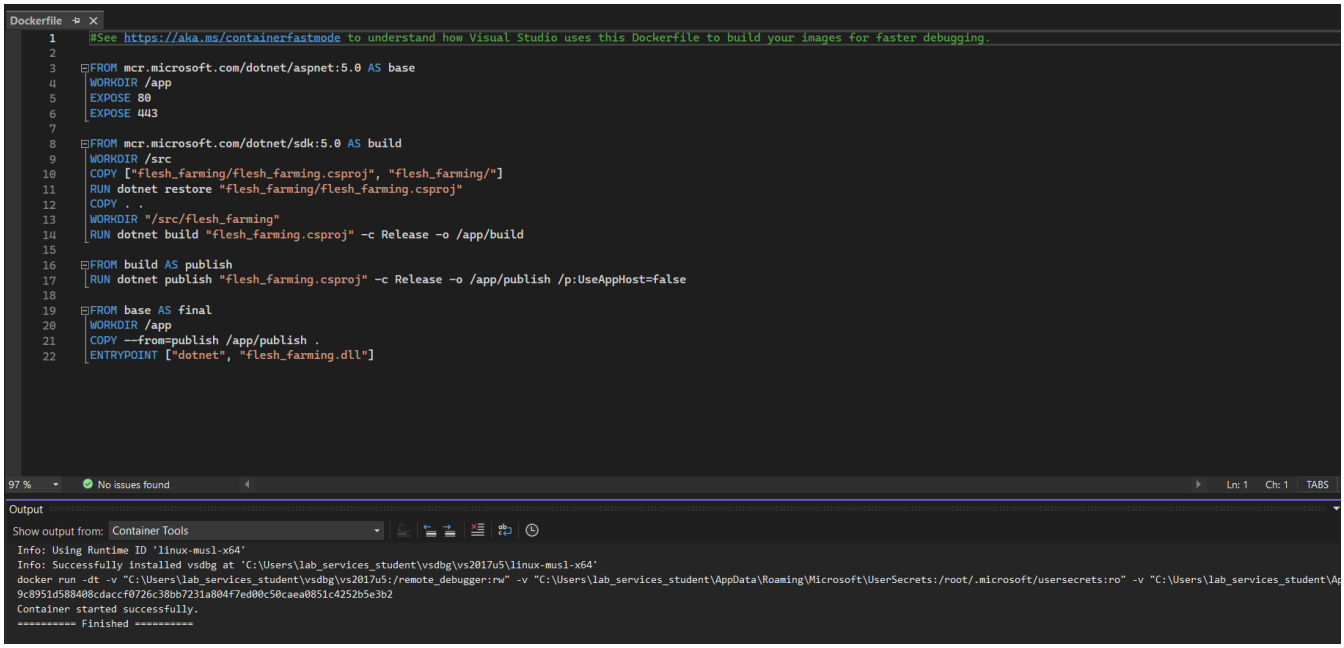
How does DevOps fit in with Agile Methodology?

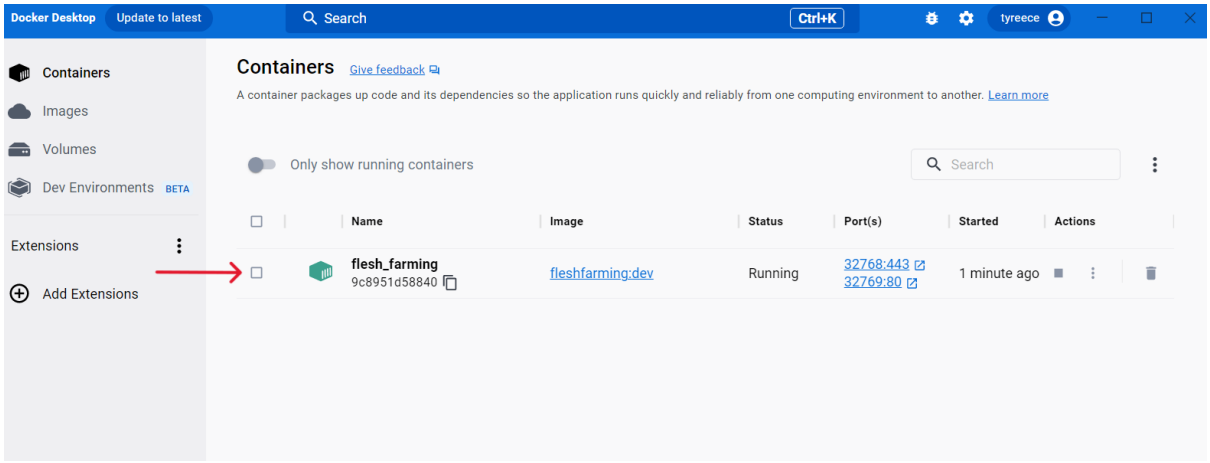
Agile's focus is placed on iterations and DevOps ties in with Agile by focusing on the collaboration between development and operations teams.

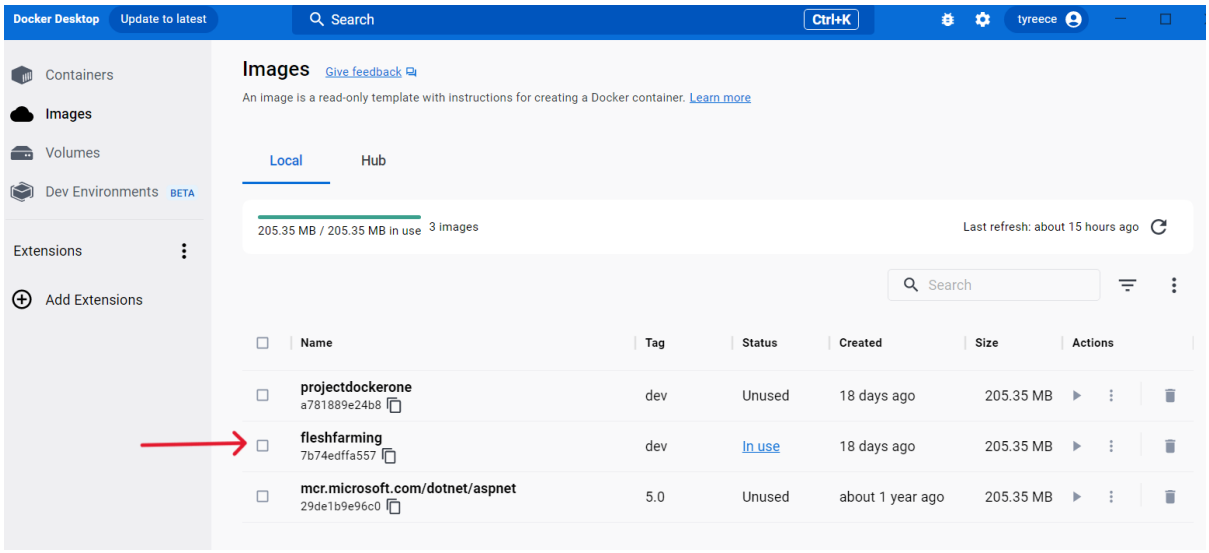
- DevOps and Agile are based on the same principles. Both methodologies are focused on collaboration and improving continuously.
- Feedback. DevOps and Agile make use of feedback throughout their development process. Agile teams receive feedback from users after sprints have been completed in order to improve the software, and DevOps uses feedback from monitored systems and users that allows them to improve software.

DevOps is used in the development of the website

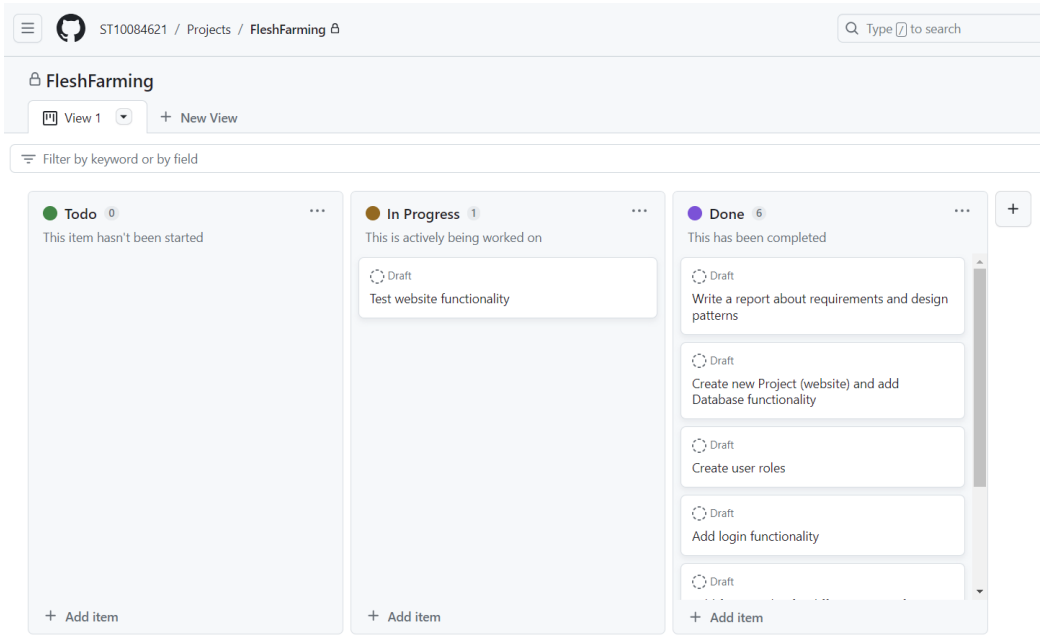
Docker support is added:







Kanban is added:



Framework TOGAF

Using TOGAF (The Open Group Architecture Framework) is recommended.

What is TOGAF and why should it be used?

The TOGAF framework used in enterprise architecture that bridges the gap between IT execution and business strategy. It is a framework that should be used because it will help Flesh Farming to design their specific software that is fit to meet their requirements.

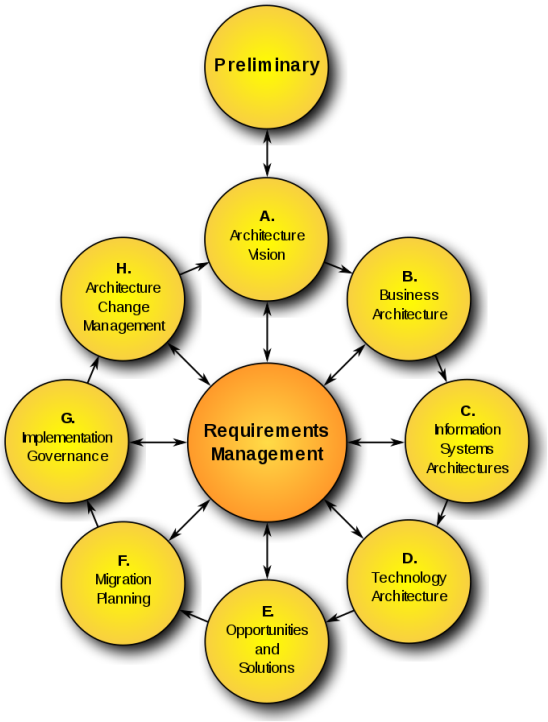


Figure 1 - ADM (Architecture Development Method) (Jink, 2018).

Preliminary

- A website will be created for Flesh Farming that will be used for the management of their stock. Flesh Farming have a brick and mortar store that their products will be sold from and those products will be managed using this website by the following users:
- There are 3 different types of user roles for this website.
    - Admin: Add product types to the database and perform the functions of an Employee and Farmer.
    - Employee: Add Farmers to the database and view a list of products by specific Farmers.
    - Farmer: Add products to their profile.

Phase A: Architecture Vision

- This website will be used for the stock management of Flesh Farming, which will yield less errors than a paper based system and be an efficient tool to suite their business needs. When this system is running, Flesh Farming will have a way to manage their stock efficiently online.
- Management of products and users of Flesh Farming is made easy and efficient.
- Amount of products can be totalled and analysed.
- Products are easily viewable.
- Farmers can be added to the system easily.
- People and businesses that are interested in buying meat can benefit off of the efficiency created when stock is being managed using the website.
- Currently there is no website for Flesh Farming, Farmers who do business with Flesh Farming have to directly at their brick and mortar store. Once the website is created and deployed, Farmers can add products to their profile online and those products will then be managed on the website by the Employees of Flesh Farming.
- The website created for Flesh Farming converts their system to a modernized one that can be used to efficiently manage the products that they are selling. Employees can record the statistics of products to figure out which products sell the most and how Flesh Farming can maximize profits based off of this.
- Stakeholders of Flesh Farming can have online meetings on Microsoft Teams with the development team so that communication is made simple and effective throughout the software development process.

Phase B: Business Architecture

- Stock tracking is enabled. Using the new system, Flesh Farming can keep track of their stock at all times. This will allow for stock to be managed and analysed. Statistics of stock can be recorded and used in reports for the sales of Flesh Farming along with their associated Farmers.
- Employees can manage the different types of products.
- Farmers can add their products onto their profiles and distribute their stock to Flesh Farming's brick and mortar store.
- The website caters for scalability by allowing Farmers to add many products to the database.
- The website has a user friendly design that specifically created for stock management.
- Only registered users may have access to the website.

Phase C: Information System Architectures

- The system Flesh Farming currently uses, now shifts to an online stock management system.
- Employees can view stock, do stock analysis', thy can predict a trend analysis on sales, run monthly checks, view which clients are buying products and how much of a product are they buying.
- Farmers can add their products to their profile.
- The interface of the system is user friendly and easy to use for each type of user.
- The website can be accessed using a browser by entering the URL of the website into it.
- The TOGAF framework is used in the implementation of the system.

Phase D: Technology Architecture

- A relational database is used to store data of Employees, Farmers and Products.
- Flesh Farming need a PC onsite at the brick and mortar store for stock management and admin.
- The website will be deployed on the server that the Azure cloud provides.
- GitHub is used for version control.
- A Docker container and image is created and used for this website.
- .NET framework 5.0 is used for the creation of the website.
- Microsoft Identity is the API that is consumed via the website.
- Bootstrap is applied to style the CSS of the components of the website.
- There is no installation of software required because it is a website, Chrome or any browser can be used.

Phase E: Opportunities and Solutions

- The Admin, Employees and Farmers will need to be trained on site as to how they will go about performing their tasks on the website.
- The only compromise is that internet connection and access to a PC is required to access the system.
- As soon as the website is developed and deployed (23th June 2023), the users may start making use of it as they need to.
- In terms of the implementation of the software, users of the website will be given a link in which they can access the website on their browser.
- The system will continue to be maintained by the development team for as long as the system is needed to be up and running by Flesh Farming.

Phase F: Migration Planning

- All of the users of the website (Admin, Employees, and Farmer) will be informed that there is a website.
- Cost factors:
    - There will need to be 2 PCs on site that will be used for stock management.
    - Flesh Farming will need to ensure that they have fibre internet connection.
- All of Flesh Farming's stock will be stored online.

Phase G: Implementation Governance

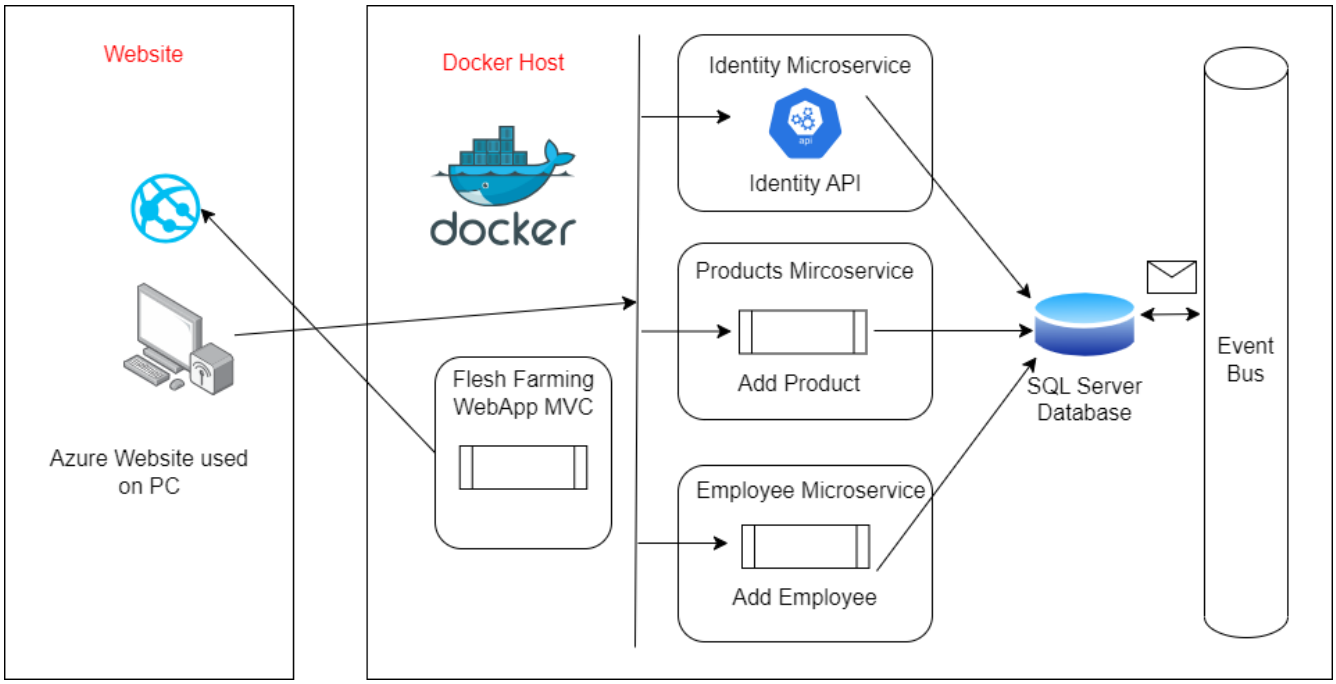
- The website complies with the existing rules and regulations of Flesh Farming and does not contain illegality of any form.
- The POPI act is followed responsibly.
- The software fits in with the rules and regulations of Flesh Farming by only allowing Employees to view stock information and only allowing registered users that are meant to be using the system to have access to it.

Phase H: Architecture Change Management

- The website will be continuously monitored in order to look for changes.
- If there are any changes with regard to products, the location of the Flesh Farming's brick and mortar store, the store changing from retail to wholesale, the entire ADM cycle will restart.
- New functions may be added to the system if Flesh Farming requires it.

Short Description of technical solution

The technical solution for Flesh Farming's stock management website is a user-friendly online platform that is combined with their systems that already exists. By making use of modern web design and methodologies that suite the purpose of the system, a website is created that provides Flesh Farming with real-time control and management over stock, which allows them to optimize their products to their liking. By using this solution, Flesh Farming increases in efficiency and is more operational than ever, this will result in increased profit. Business is taken to the next level by using an efficient website suited exactly to Flesh Farming's needs and will only pay off more over time.



Conclusion

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References

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