PATHWAY: XBCAD7319

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WORK INTEGRATED LEARNING PART 1

Group Name: Code Addicts

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Scrum Agile Board: <https://trello.com/invite/b/66f3ec71915caa196897689b/ATTIef1728e5d554052d2e321f8c6618193111439D30/code-addicts>

Source Code Repository: <https://github.com/Mehlulibooi/Code-addicts.git>

# 7. ARCHITECTURE ARTIFACTS

## 7.1 Design pattern

Design pattern is a general solution that is repeatable to a commonly occurring problem in software design. It is a description which tells us how to solve a problem that can be used in many different situations (sourcemaking).

### 7.1.1 Factory Pattern Design Pattern

It is a creational design pattern which provides an interface for creating objects in a super class, which allows the subclasses to alter the type of objects that will be created. This pattern is particularly useful when the exact types of objects to be created may vary which enables flexibility and extensibility in object creation. The use of this pattern can help TK and NK Trading and Projects PTY LTD create objects for each type of server like local move, packaging, and furniture removals (Geekforgeeks, 2024).

## 7.2 Architecture Pattern

Architecture Pattern is the fundamental structure of a software system which are usually based on design patterns. They describe how the main elements interact with each other in a system (Grimm, 2023).

### 7.2.1 Model-View-Controller (MVC)

MVC is an architectural design pattern that is able to organize an applications logic into different layers, that are able to carry out a set of tasks. This is a great option to use to implement a web application as it is able to separate the business logic like the pricing, schedules, and availability of staff from the user interface (Sheldon). The reason we chose this because we are working with multiple frontend and backend languages and MVC helps us to have a clear separation and responsibilities efficiently.

### 7.2.2 Layered Architecture

Layered Architecture which is known as the n-tier architecture pattern, is the components within a layered architecture pattern that are organized into different horizontal layers that each have a specific role. For TK and NK Trading and Projects PTY LTD, this pattern divides our web application into layers such as the presentation layer which consists of HTML, CSS, and JS, then the business logic layer which is C#, and the data access layer which is SQL (oreilly). We chose this as it is easy to implement and maintain.

## 7.3 Cloud Architecture

Cloud Architecture is the manner in which technology components combine to build a cloud in which different resources are collected through by virtualization technology which they’re all shared across a network (vmware).

### 7.3.1 Hosting Platform

In order to host the web application for TK and NK Trading and Projects PTY LTD, we are going to use Microsoft Azure Services as hosting on the cloud ensures that users can have access to the application from anywhere. Also it allows the company to have scalability and flexibility to meet changing demands (Walterions).

### 7.3.2 Database

We plan on using a cloud hosted database like Azure SQL Database for storing information about the services of the company. We chose to store the data in the cloud as it offers great security and scalability when handling customer information. It is also has reliable availability as it promises that there will virtually be no downtime for users on the database it hosts (Lawale, 2023).

## 11. CHANGE MANAGEMENT

### 11.1 Organizational Adaptation

The organization will adopt our software by integrating it into TK and NK Trading and Projects PTY LTD daily operations. This application will assist with managing transportation services, making it easier for employees to manage customer orders, schedule moving dates, and track the logistics.

With this software it will streamline operations and improve the customer experience It is designed to reduce manual work and enhance efficiency, which is important for an organisation that deals with logistics and moving services.

## 11.2 User Adoptation

Users will adopt this software because it give the users an easier way of requesting services. With the focus of having a grate and simple user interface, it will simplify the experience of having to hire transportation services.

The reason why users are more likely to use our software is because of ease of use and convenience. Being able to check the services offered and request a service is significantly more efficient that using traditional ways for calling and in-person scheduling.

## 11.3 Strategy to Gain Adoptation

User education: There will be tutorials or steps that will inform the customer on how to request a service and contact TK and NK Trading and Projects PTY LTD.

Employee training: The company’s employees will be trained and informed on how to use the software, particularly on managing services and customer requests.

Customer feedback: We will implement a system that will ask users to provide feedback on their experience with using the software, which will allow us to make improvements based on the real world user experience (Hotjar, 2022).

# REFERENCE LIST

Geekforgeeks, 2024. *geekforgeeks.* [Online]   
Available at: https://www.geeksforgeeks.org/factory-method-for-designing-pattern/  
[Accessed 27 September 2024].

Grimm, R., 2023. *LinkedIn.* [Online]   
Available at: https://www.linkedin.com/pulse/architectural-patterns-rainer-grimm  
[Accessed 27 September 2024].

Hotjar, 2022. *Hotjar.* [Online]   
Available at: https://www.hotjar.com/customer-feedback/benefits/  
[Accessed 27 September 2024].

Lawale, D., 2023. *Softensity.* [Online]   
Available at: https://www.softensity.com/blog/benefits-and-features-of-azure-sql/#:~:text=Azure%20SQL%20Database%20leverages%20all,about%20maintenance%20or%20potential%20outages.  
[Accessed 27 September 2024].

oreilly, n.d. *oreilly.* [Online]   
Available at: https://www.oreilly.com/library/view/software-architecture-patterns/9781491971437/ch01.html  
[Accessed 27 September 2024].

Sheldon, R., n.d. *techtarget.* [Online]   
Available at: https://www.techtarget.com/whatis/definition/model-view-controller-MVC  
[Accessed 27 September 2024].

sourcemaking, n.d. *sourcemaking.* [Online]   
Available at: https://sourcemaking.com/design\_patterns  
[Accessed 27 September 2024].

vmware, n.d. *vmware.* [Online]   
Available at: https://www.vmware.com/topics/cloud-architecture  
[Accessed 27 September 2024].

Walterions, n.d. *Walterions.* [Online]   
Available at: https://walterions.io/azure-cloud-architecture-and-engineering/#:~:text=Benefits%20of%20Azure%20Cloud%20Architecture%20%26%20Engineering&text=Enhanced%20Security%20and%20Disaster%20Recovery,with%20Azure%27s%20disaster%20recovery%20features.  
[Accessed 27 September 2024].