

ACME

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1 Introduction

ACME (Aston Car Management Enterprises) is a car rental that offers rentals, primarily but not exclusively, to people in the Aston area. This includes a range of customers from working individuals to the large student population the city has. The company currently uses email and telephone for both customer requests and internal communications.

However the company has realised that the current system is outdated and not a good user experience for the customer. In addition to this the profits of the company have been on a slow decline as newer competition has risen, taking away some of ACMEs customer base.

The aim of this report is to come up with ways in which this problem can be tackled, coming up with a design that can be implemented. This report discuss the stakeholders, business goals and current situation ACME is in. From this use cases and requirements will for the new system will be designed, followed by both activity and sequence diagrams to demonstrate how the system could work on a lower level. Finally the report will evaluate the suggested design, offering additional changes that could be made in the future.

2 Overview

Currently ACME uses an outdated paper-based approach, communicating with customers and other staff members using a combination of telephone and email. The current system has numerous problems such as:

1. Due to the paper-based approach important details such as details about orders, cars and accounting can often go missing causing issues for both customers and internal staff.
2. Backups of data are difficult and time consuming due to the paper-based approach and their risk management for the same reason is near non-existent.
3. Customer experience is not optimal due to the updates coming through telephone calls or email only.

In addition to this, the system does not contribute to ACMEs current business goals, which are:

1. **Increase profits/customers -**
2. **Improve documentation resilience and navigability -**
3. **Cater to the student demographic -**
4. **Automate/speed up time intensive tasks -**

2.1 Propose changes

In order to fulfill the above business goals ACME has decided to upgrade it's outdated system with a new automated, digital system. The new system will no longer use paper based records, instead opting for a digital solution, which can either be in the cloud or an on prem server. The solution should not remove any of the current functionality of the system. However can replace them for more modern alternatives. Some of the planned replacements include:

1. A new system where users can sign up and book rentals, without direct interaction from staff members. This includes a new payment system where customers will be able to pay through the new application immediately without going into the store. The details of both customers and order will be stored in the new database. These changes will help ACME to achieve business goals 1, 3 and 4.
2. A new system for staff to add/edit/delete cars in the system, these details will also be stored in a database. This will help to reach business goals 2 and 3, by speeding up internal workings due to switching to a database instead of the old paper based system. It may also indirectly help with business goal 1 as staff will have more time to do more important things for the company. Another potential is that the number of staff needed

could be reduced due to the optimisation, however this would need to be thought about due to potential ethical issues.

3. As part of increasing profits and catering to the student demographic, ACME has made a bold plan to try and incorporate cryptocurrency payments into its new system. Cryptocurrency adoption in the UK has been growing in popularity, doubling since 2019 [1]. In addition to this a survey done in Germany showed that '18-to 27-year old survey respondents were three times more likely to own a digital currency' [2] and BanklessTimes wrote an article summarising a Finder report that showed 38% of all cryptocurrency holders in the UK were between the ages of 18-34 [3].

Age Group	Adoption Rate
18-34	38%
34-54	43.5%
55+	20%

Table 1: Table showing adoption rate based on age in the UK [3]

2.2 Software development model

The software development lifecycle (SDLC) usually consists of between 5-7 phases. This isn't a strict rule however with names changing and certain phases often not being included. The figure below shows the SDLC I will be following, **Appendix A** shows a full 7 stage model.



Figure 1: Figure showing the phases of SDLC. [4]

1. **Plan** -
2. **Design** -
3. **Develop** -
4. **Test** -
5. **Deploy** -
6. **Review** -

This report covers only covers the plan and some design aspects of the SDLC. Using an SDLC includes benefits such as helping understand requirements, identify risks [6] and speed up delivery of a project. Imagine skipping the plan and design phase above, jumping straight into development. The developers would not know what the system should look like and deliver a subpar final product

For this project I would recommend the use of the agile framework. This methodology is described as

'The Agile methodology is a project management approach that involves breaking the project into phases and emphasizes continuous collaboration and improvement. Teams follow a cycle of planning, executing, and evaluating.' [7]

3 Stakeholders and Use Cases

Stakeholders introduction

3.1 Identifying stakeholders

Intro here

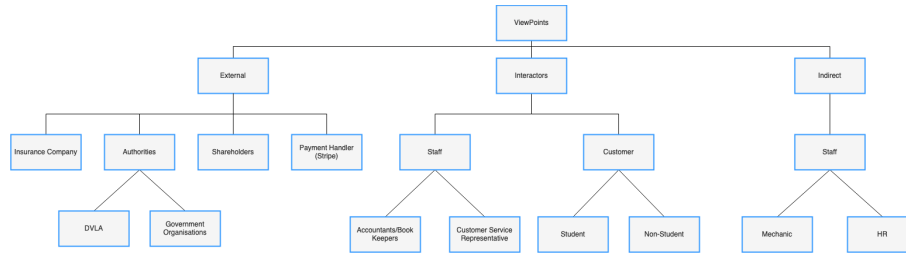


Figure 2: Viewpoint diagram to help identify stakeholders.

3.2 Use case diagrams

Intro here

3.2.1 Customer Service Representative

Text

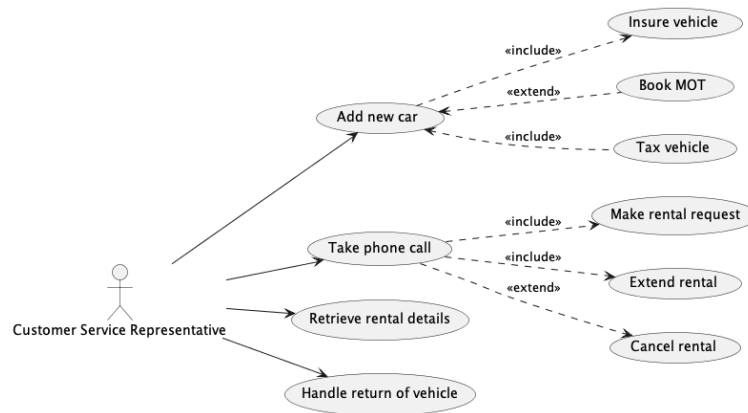


Figure 3: Use case diagram for customer service representative.

3.2.2 Customer

Text

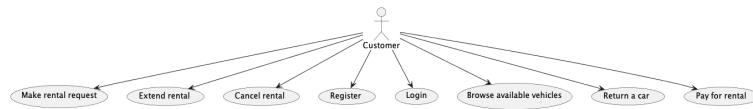


Figure 4: Use case diagram for customer.

3.2.3 Finance/Accounting

Text

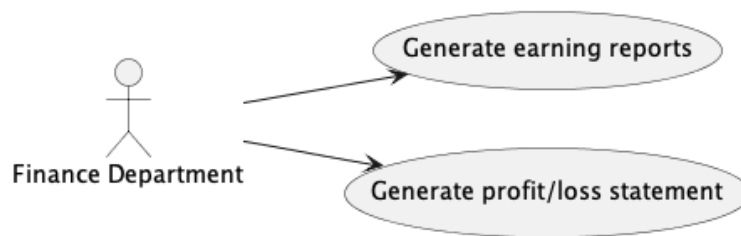


Figure 5: Use case diagram for finance/accounting department.

3.2.4 Insurance Company

Text

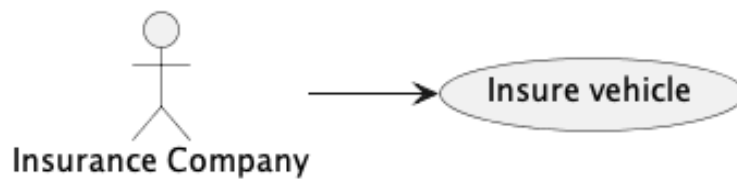


Figure 6: Use case diagram for insurance company.

3.2.5 Mechanic

Text

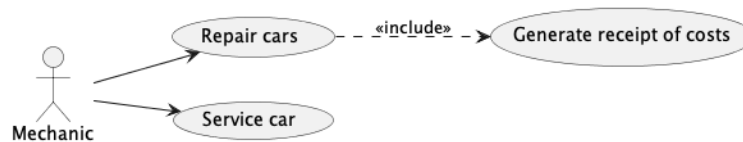


Figure 7: Use case diagram for mechanic.

3.2.6 Payment Service (Stripe)

Text

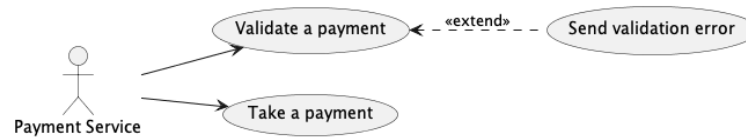


Figure 8: Use case diagram for payment service provider.

3.3 Use case considerations

Text here

4 Requirements

Requirements

5 Design

Design Intro here

5.1 Adding a new user

Text

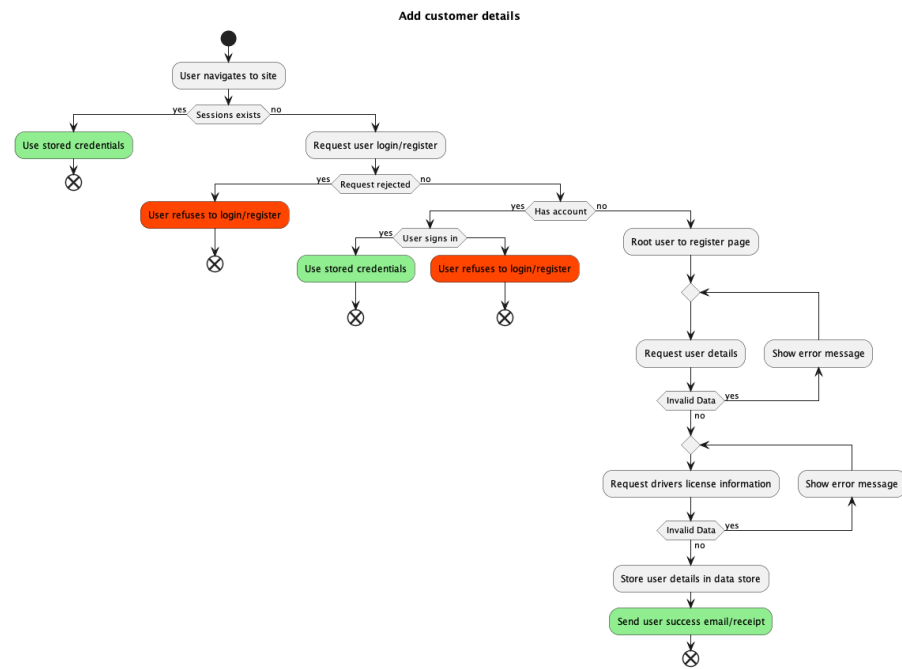


Figure 9: Activity diagram for adding a new user, this includes sign in/up.

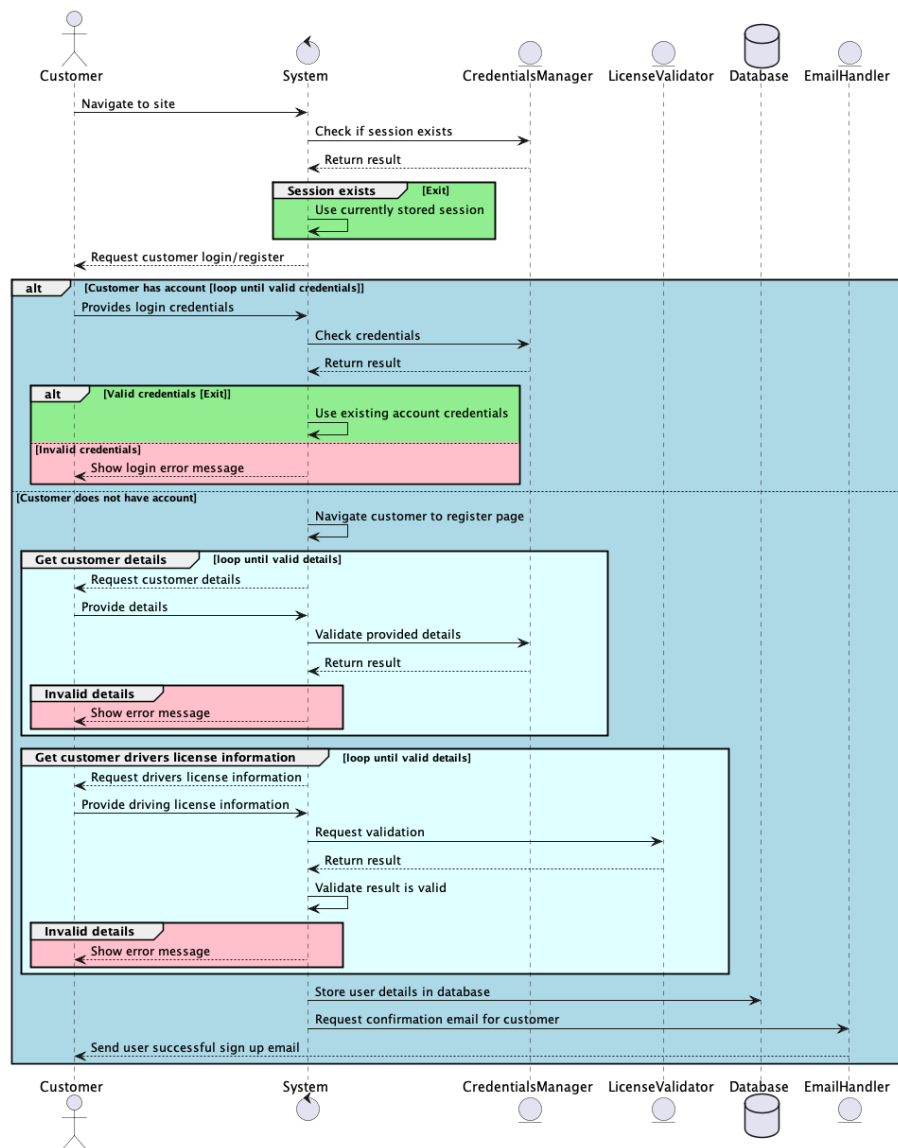


Figure 10: Sequence diagram for adding a new user, this includes sign in/up.

5.2 Taking a payment

Text

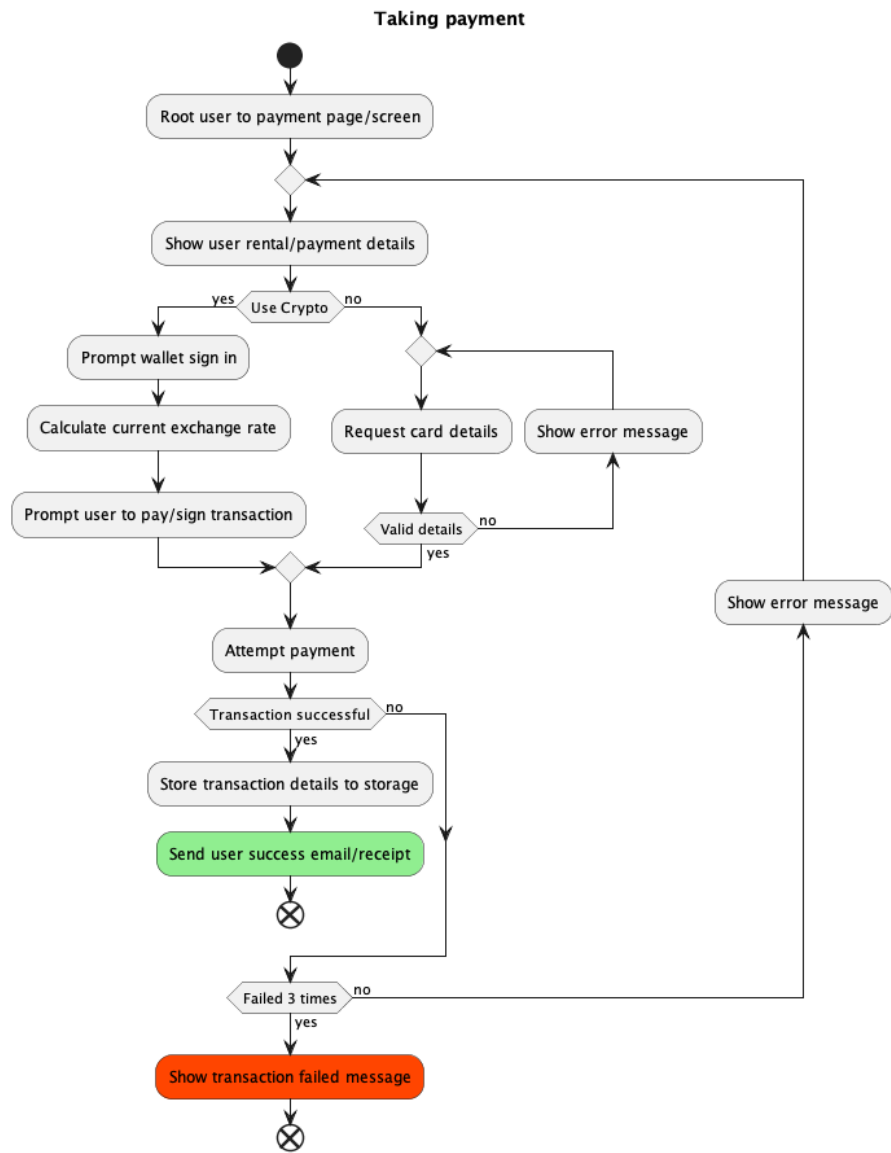


Figure 11: Activity diagram for taking a payment.

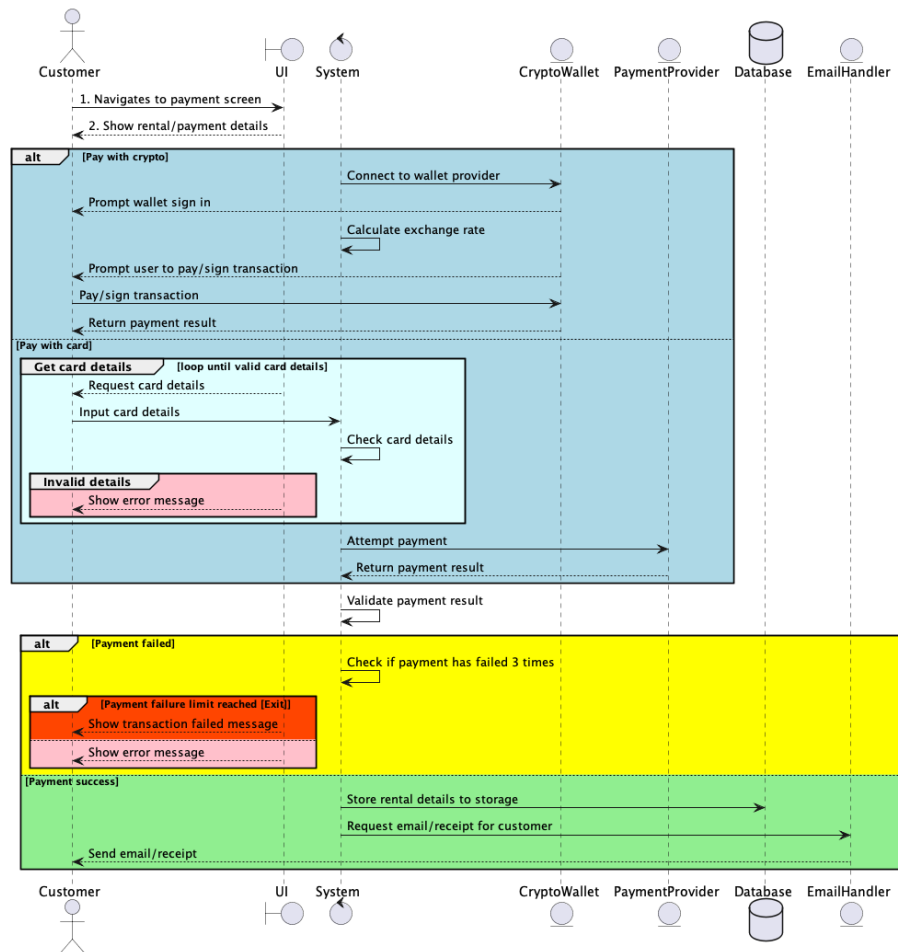
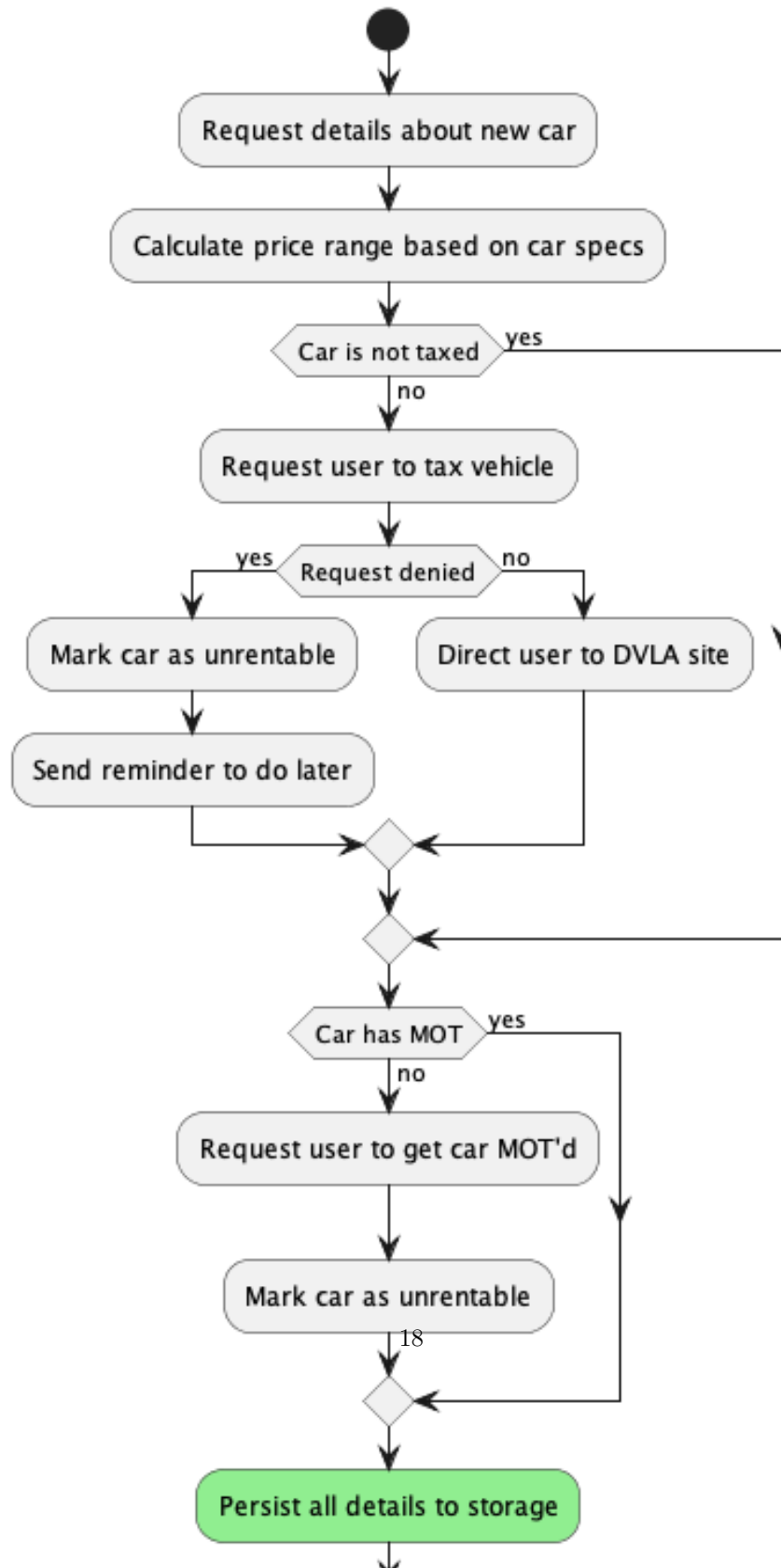


Figure 12: Sequence diagram for taking a payment.

5.3 Adding a new car

Text

Adding a new car to the system



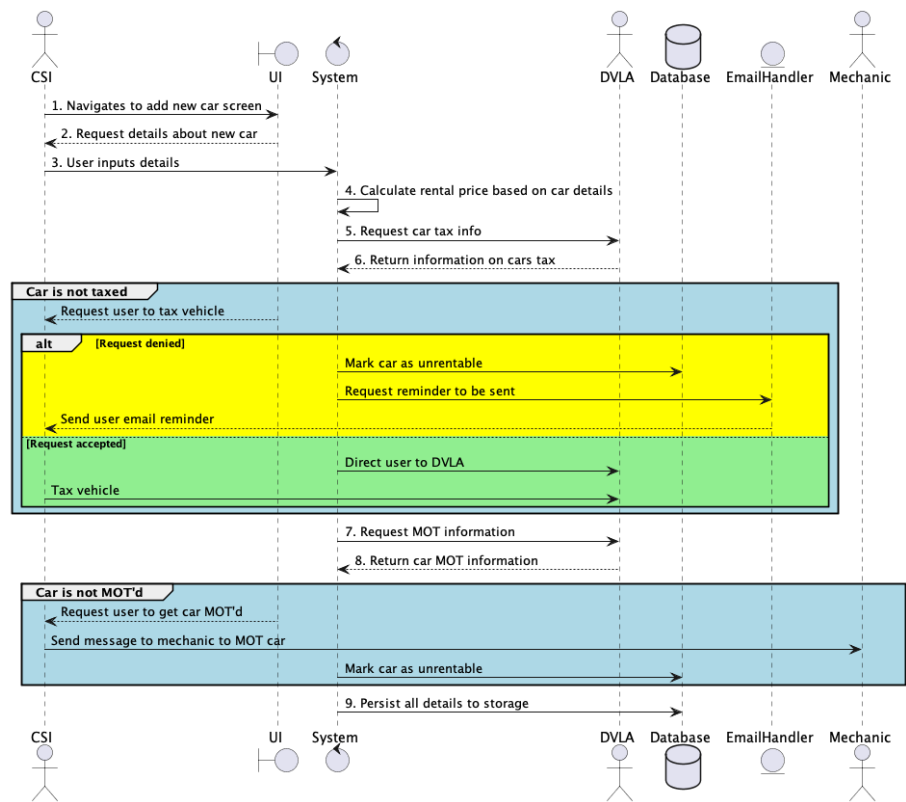


Figure 14: Sequence diagram for adding a new car to the system.

6 Conclusion

Conclusion

7 References

- [1] Statista. (2023) *Crypto ownership by country 2019-2023* — Statista. Available at <https://www.statista.com/statistics/1202468/global-cryptocurrency-ownership/> (accessed on 28th May 2023).
- [2] Best, R. (2021) *Cryptocurrency adoption among consumers - statistics & facts* — Statista Available at <https://www.statista.com/topics/7705/cryptocurrency-adoption-among-#topicOverview> (accessed on 28th May 2023).
- [3] Nagari, S. (2023) *Cryptocurrency Adoption Statistics in the UK* Available at <https://www.banklesstimes.com/uk/buy-cryptocurrency/crypto-adoption/> (accessed on 28th May 2023).
- [4] Laoyan, S. (2022) *What is Agile methodology? (A beginner's guide)* Available at <https://asana.com/resources/agile-methodology> (accessed on 29th May).
- [5] Arkbauer (2023) *Software development life-cycle (SDLC)* Available at <https://arkbauer.com/blog/software-development-life-cycle-sdlc/> (accessed on 29th May).
- [6] Coursera (2023) *What Is the Software Development Life Cycle? SDLC Explained* Available at <https://www.coursera.org/articles/software-development-life-cycle> (accessed on 29th May).
- [7] Atlassian (2023) *What is the Agile methodology?* Available at <https://www.atlassian.com/agile> (accessed on 29th May).

8 Appendix

8.1 Appendix A - An example of a 7 phased SDLC

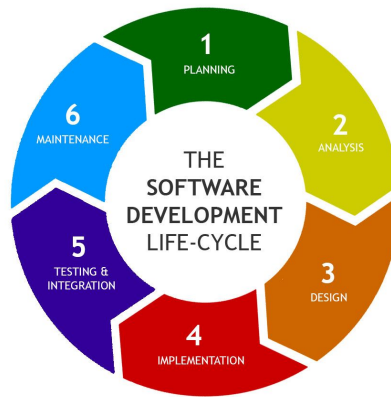


Figure 15: SDLC with 7 phases [5]

8.2 Appendix B - Use case diagram with all actors

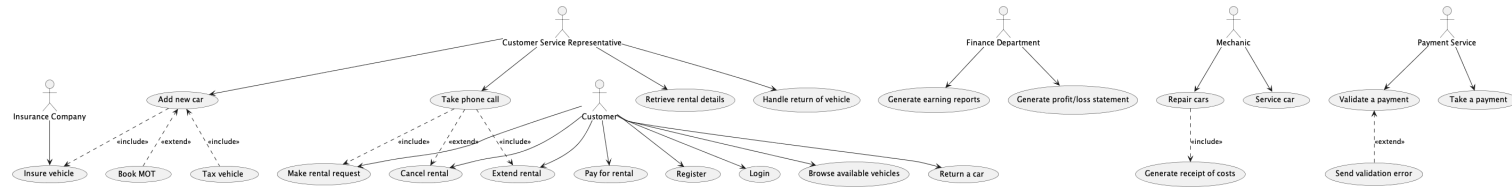


Figure 16: Full use case diagram, showing all actors.