COMP1429: Systems Modelling Group Work

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A report submitted in fulfilment of the requirements for the module, Systems Modelling, Computing and Information Systems Department, University of Greenwich.

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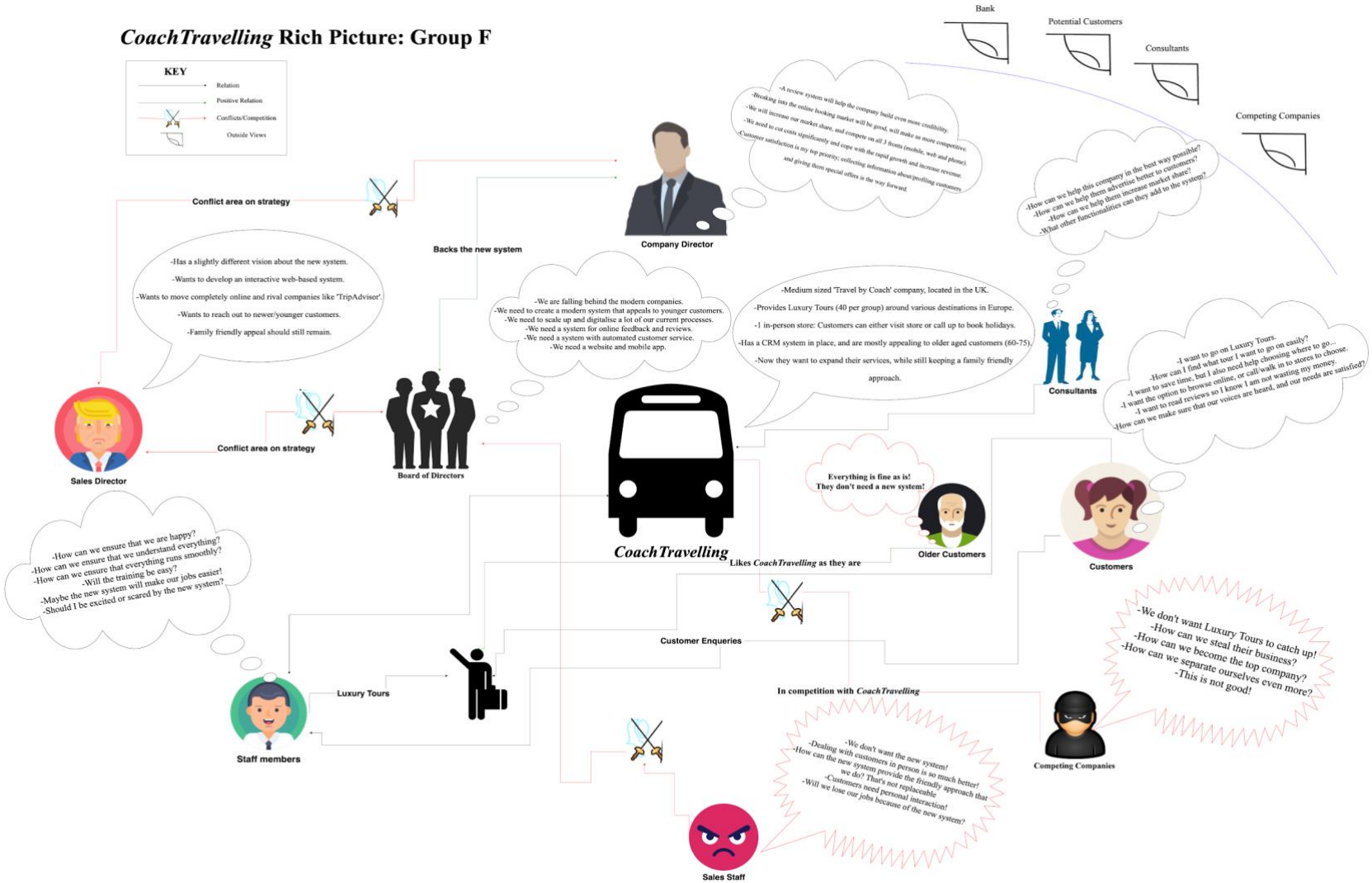
Rich Picture



Assumptions:

- There are competing companies that could potentially take business away from the *CoachTravelling* company. This assumption has been made as the Sales Director is thinking about comparisons to 'TripAdvisor'.
- Some of the staff, especially the Sales Team, are not too keen on the new system, as it takes away the job security they had before as their tasks become more automated.
- Younger customers would be more likely to book via the mobile app and online website options, as they are more modern.
- On the other hand, older existing customers are happy to book in person or over the phone, and are the main reason that the company still continues to grow, despite their outdated practices.
- The last assumption made is that most of the staff, apart from the sales team, are happy with the changes proposed, and are ready to jump on board.

Discussion of Key Stakeholders:

The potential internal stakeholders of this system include, but are not limited to, the owners, directors, staff members and the consultants that are involved with analysing, designing and developing the new system for the project. The external stakeholders would be the external agencies (such as banks and creditors), as well as members of the public, including customers, as they would be the main consumer of the new and improved system. Other key stakeholders include any external companies that might need to be included in the mix, such as hardware and software suppliers that will provide computers, routers and software packages to help with the scalability of the project. These stakeholders in addition to the consultants are especially important as the quality of work they produce depends on the budget that they have been given; a higher budget *should* yield better results in most cases, but this is not always the case. It is important for all of the stakeholders to be on the same page to establish reasonable guidelines, and ensure that the project runs as smoothly as possible.

Root Definition and CATWOE

Root Definition:

A *CoachTravelling* owned system, to offer existing and potential customers a new way to purchase and enjoy luxury group tours (x), through the development of an online software based system and mobile app designed by consultants with a 3 week training programme (y), to accomplish the goal of the *CoachTravelling* Board of Directors; to ease the sales staff into a new hybrid workplace, automate customer service processes to attract younger customers, cut costs/increase sales, and expand their presence to keep up with competing companies.

CATWOE:

Customers	● Tour groups ● Existing older customers ● Potential new and younger customers ● Existing staff and potential new staff ● External Stakeholders (investors, members of the public etc.)
Actors	● Staff members ● Consultants ● Company president ● Board of directors ● Sales director ● Customers
Transformation Process	1. Modernize the company. <u>Process:</u> ● Develop an online system and mobile application to change the ticketing system and allow for more avenues for ticket purchase (online, via app etc.) 2. Establish an online presence. <u>Process:</u> ● Create an online system that allows the customer to access better customer service features, such as real-time assistance. ● Allow for customers to book the specific seats that they would like to sit in, as well as amend or cancel their booking up to 24 hours in advance.

	● Create a system that allows customers to leave reviews on trips, coaches, or services that they have already used for others to see. 3. Keep up with competing companies. <u>Process:</u> ● Expand the company's overall presence to produce competition with other brands that are adapting well to technological advances. ● Expand the company's overall presence by making them easier to find. 4. Introduce staff to a new workplace: <u>Process:</u> ● Train staff within a 3 week period and prepare them for workplace changes.
World View	Big Picture: ● Overall belief that offering a new way of booking tours online will increase sales and attract new customers. There is also a belief that this is the way forward for the future. ● Modernized processes with up to date customer support and apps to assist existing customers will be better for business in the future. Board of director's view: ● Modernize the company, starting to offer Point of Sale interactions via online mobile applications and websites, and aim to have (at least) the same number of sales there as they do in person and via phone calls. ● Increase overall sales, especially online and app based sales; this is why they are spending money on consultants. Developer's view: ● System should mirror the changing nature of technology, and introduce modern software components to appeal to younger audiences, as most customers at this point are older.

	● System should be easy to use and robust so staff can be trained within 3 weeks. Staff view: ● New system should be easy to learn, or they must adjust to it. Failure to do so might lead to them getting replaced by new staff. Public view: ● Older customers: The company should maintain the existing level of customer service that they have already been able to provide. ● Newer customers: The company should adapt to the changing times and create an online system that is much improved and appeals to a younger, newer audience. ● All customers: Improved customer service via the android app or real time assistance, to benefit all customers.
Owners	● Board of Directors for the *CoachTravelling* company.
Environmental Constraints	● Conflicts between the board of directors, staff and the public ● Disagreements regarding the scope of the project (different directors have a different vision for the project, sales team does not want the project to go through etc.) ● Skill level of the consultants ● Job satisfaction ● Project budget ● Time constraints ● Legal constraints ● Competition from other companies ● Company policies ● Security

Systems Development Methodology

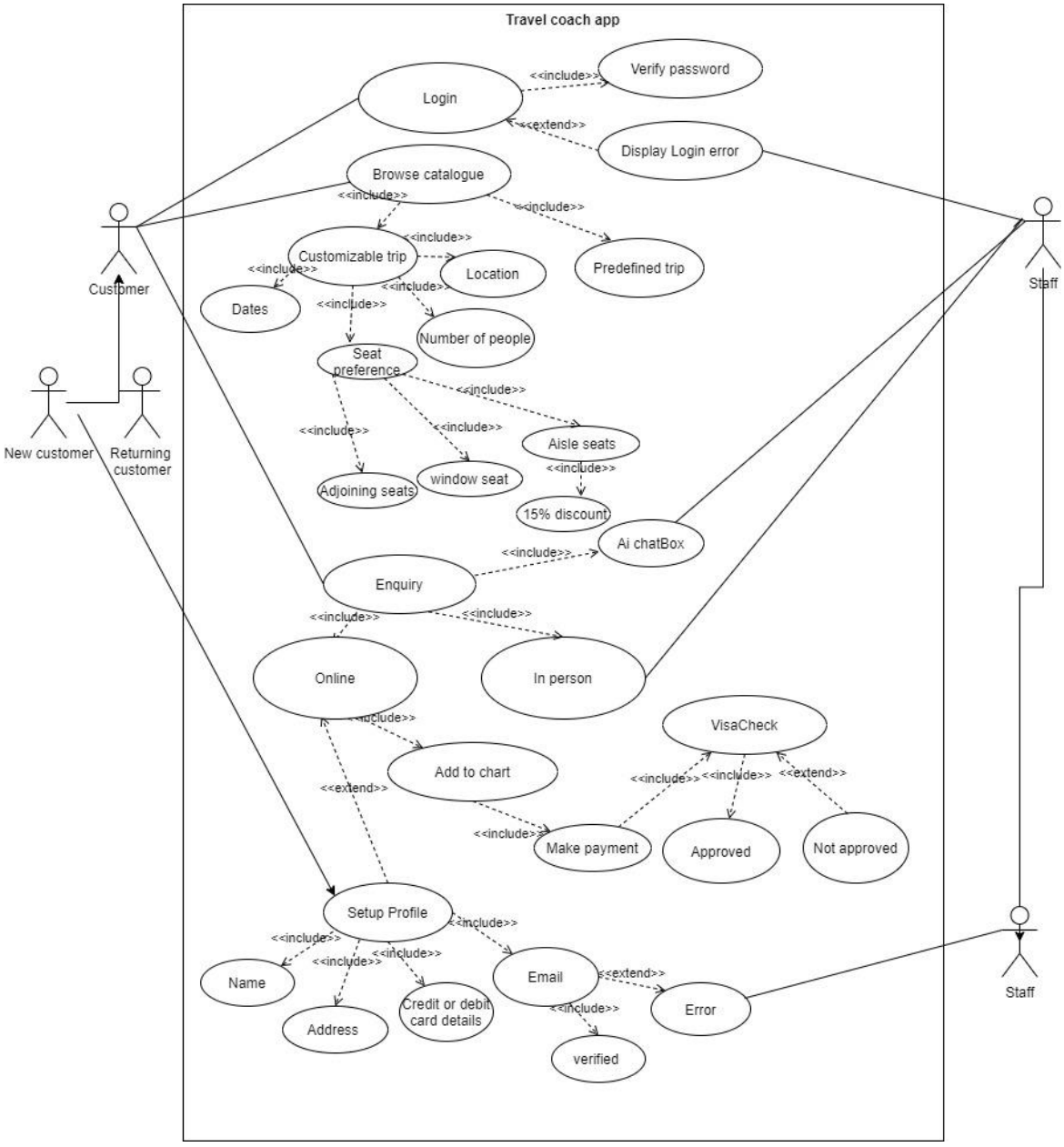
c) Discuss which systems development process/methodology your team would use when undertaking the development of the new system and why.

The team would utilize agile methodology for the development of the new online coach travelling online system because it works when the application idea or features are not well defined. This methodology permits application owners to amend the needs and their priorities by taking benefit of the opportunity and finally delivering an effective product to their client. Agile methodology increases the value to all over the process of development and importantly decreases the entire risk of the new online coach travelling system development (Kaleel & Harishankar, 2013). Additionally, to develop and design the mobile application for the online coach travelling system and to make sure the success of this mobile application of the online ticketing will be effective. This methodology helps in completing the development of the mobile application in five phases that are planning, designing, coding, testing, and closure. Agile mobile app development methodologies are an effective approach for all kinds of software development as it makes sure that there must be a correct channel of communication that is very useful for both the clients and the developers that will execute the required mobile application for any kind of new online system. This methodology makes an easier task for mobile application development, therefore the application results will be flexible after its release (Flora & Chande, 2013). This methodology helps in offering quicker development, decreases risk, offers better quality, increases customer experience and decreases the cost of the development of an application, and helps in reaching the market as early as possible. This methodology helps in making the application easier to use, user friendly, and well functioned for booking their online tickets with overall satisfaction towards their consumers.

Use Case Diagrams

d) Detailed Use Case diagrams (use <<include>> and <<extend>> where appropriate) from the perspective of two of your main actors (e.g., Customers and Staff). You need to create the scenarios for 2 of your main use cases. (1 use case from every use case diagram).

Use Case Diagram:

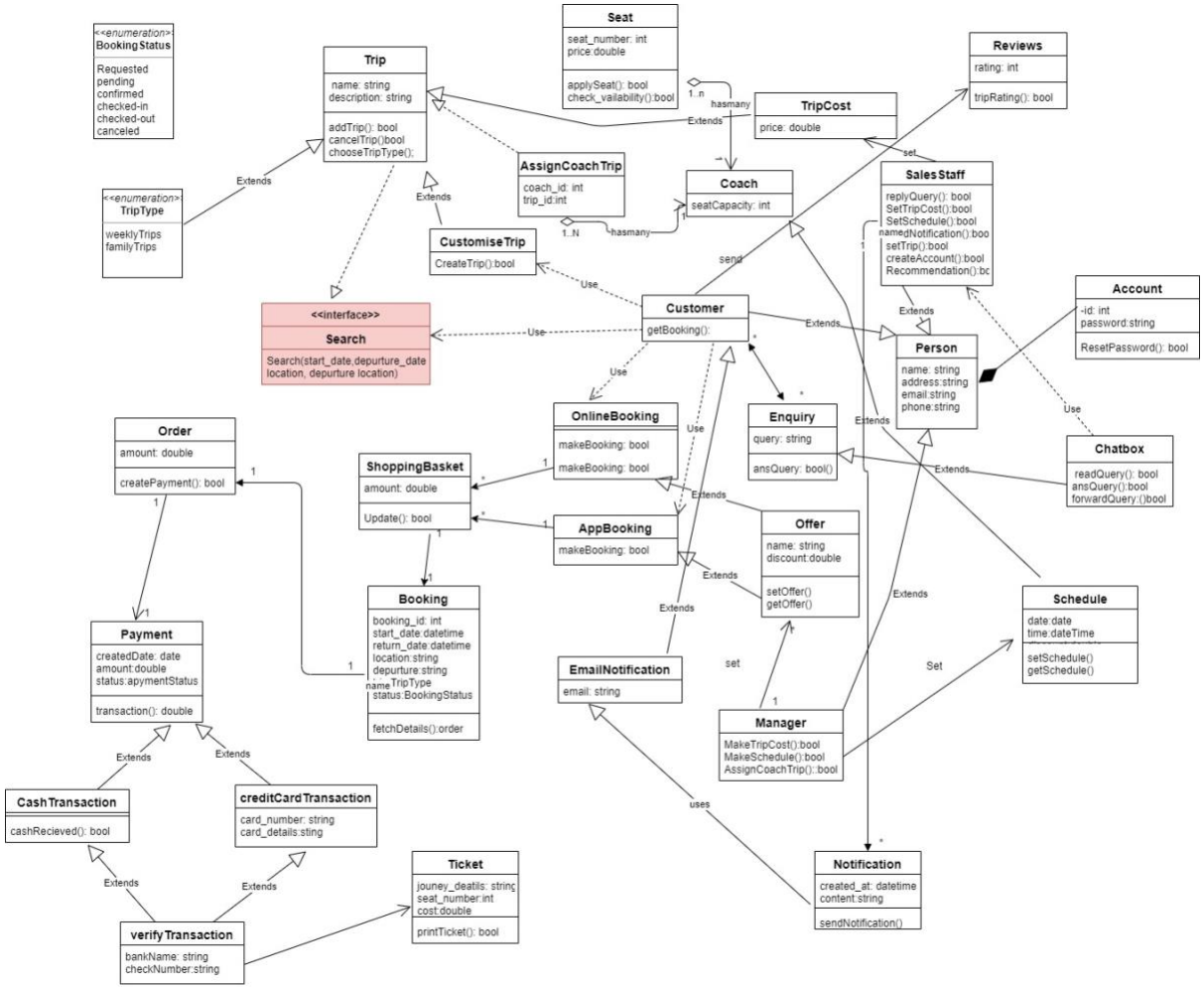


Use case descriptor table:

Use Case Name:	Travel Coach app
Actors	Customer, Staff
Description	This describes how customer can book a trip through a mobile app
Typical course of events	Step 1- This use case is initiated by the customer. Step 2-Customer provides login ID and password. Step 3-Staff can verify the Login details Step 4- Customer can login and browse the catalogue. Step 5- Customer can select the trip. Step 6- Customer can select the trip from the list Step 7- Customer can select the date, location, seat and number of people. Step 8- Customer can enquiry through AI chat box Step 9-Staff can help customer with their queries through AI chat box Step 10-Customer can book through the app or through the call Step 11- Staff can help customer through the call booking. Step 12- Customer can add the trip into the cart. Step 13- Customer can initiate the payment. Step 14- Staff can approve the payment
Alternate courses	If new customer they can register If existing customer they can directly login If payment delinces it will take back to the payment page
Precondition	This use case is initiated by the customer
Post Condition	List of trips
Assumptions	Customer will browse catalogue after login

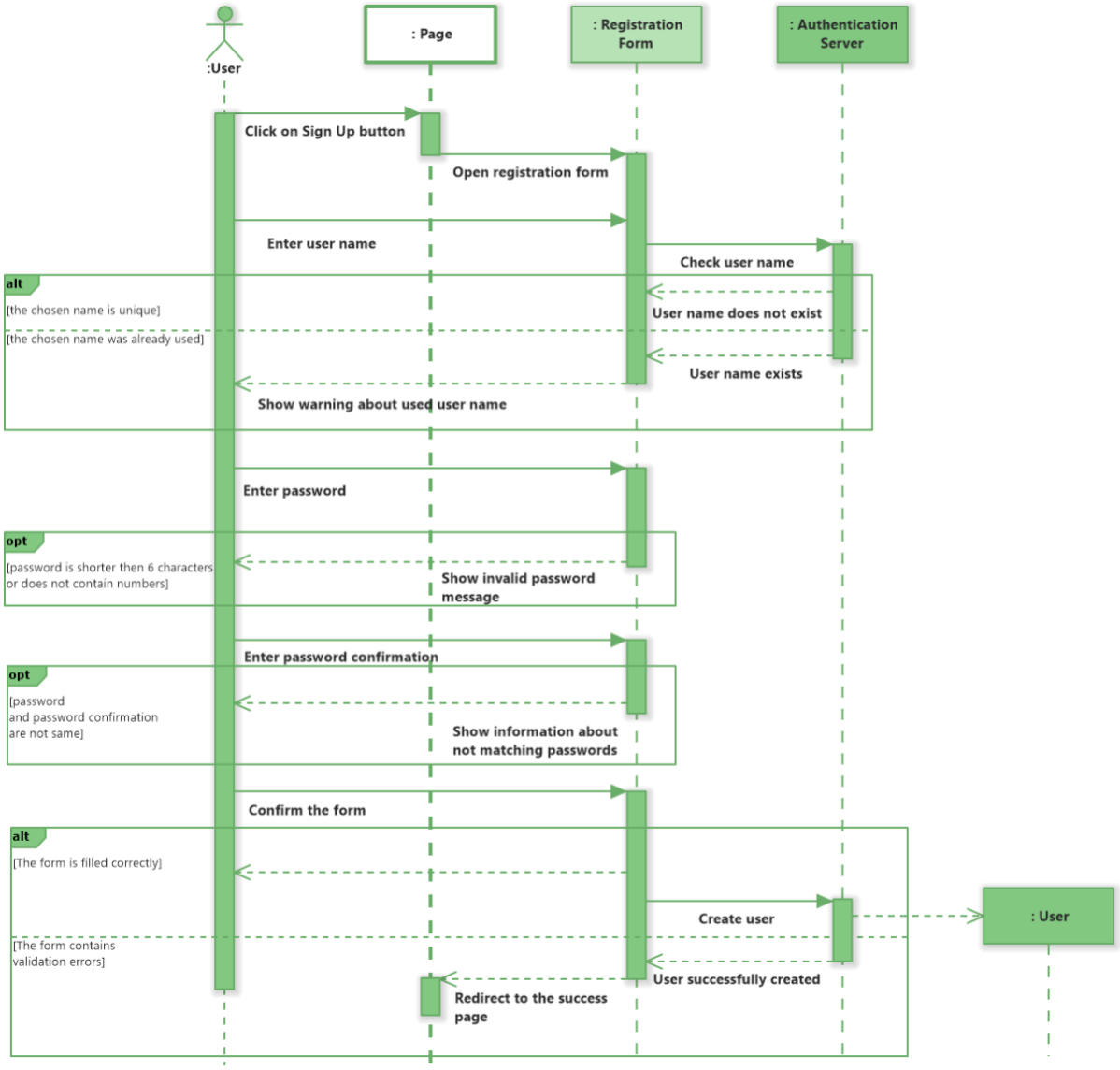
Conceptual Class Diagram

e) Below is the class diagram which demonstrates the “Coach Traveling System” main classes, attributes, methods and associations.



Sequence Diagram

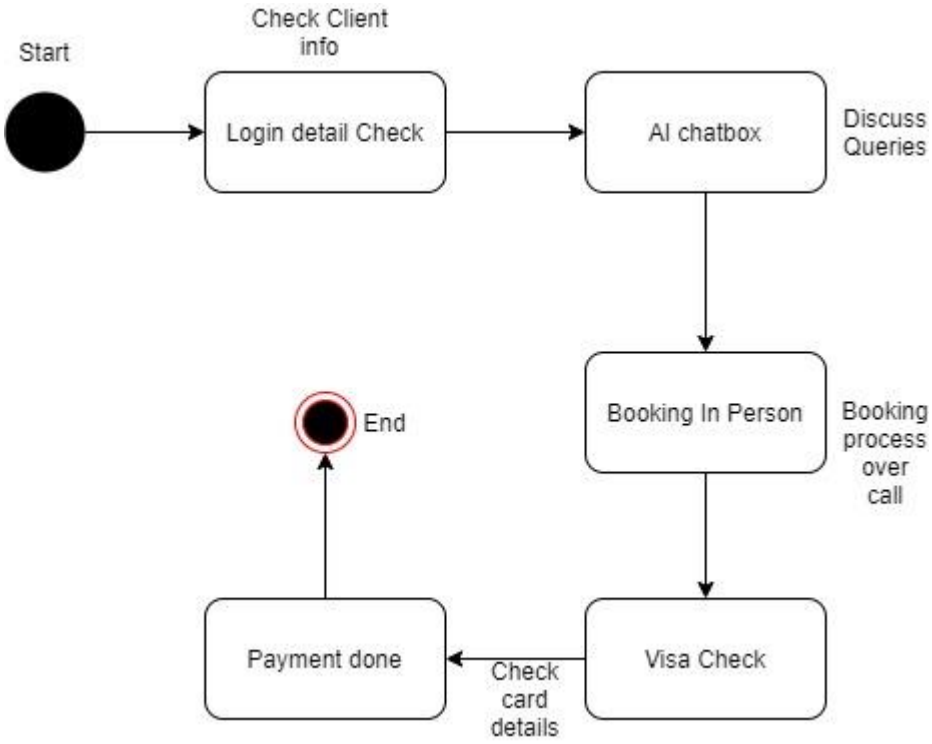
f) Below is the sequence diagram for the object Registration in the customer use case.



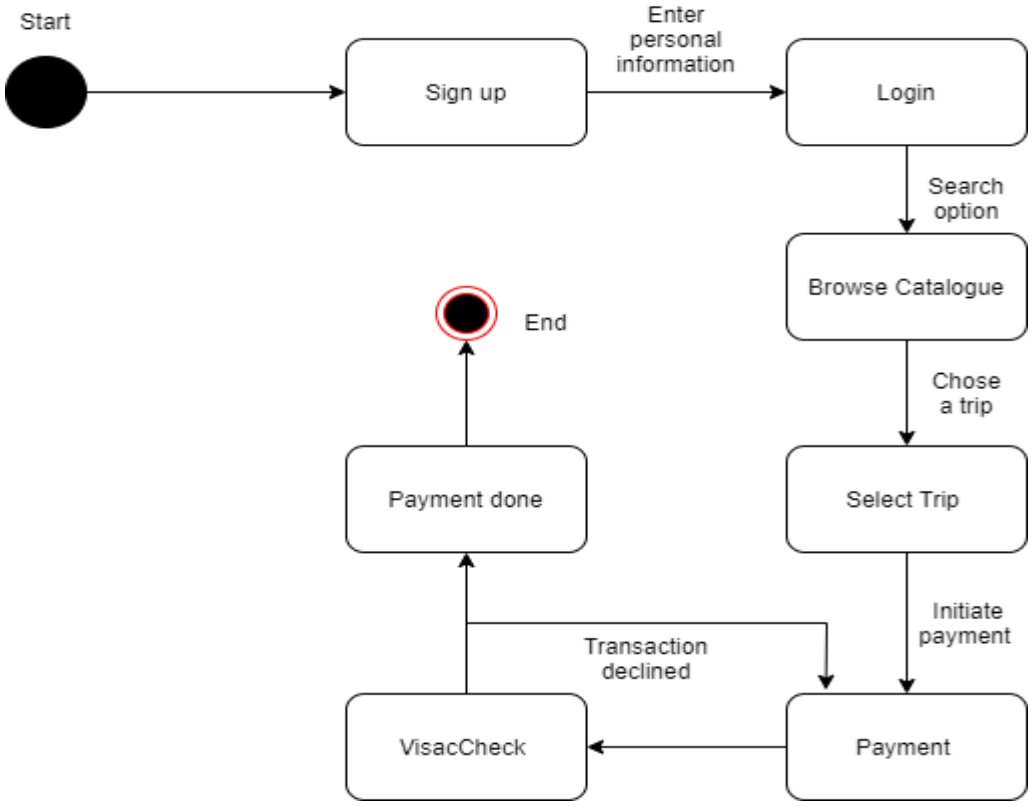
State Chart Diagrams

g) Two State Chart diagrams for two of your main classes.

- State chart diagram from staff's point of view.



- State chart diagram from customer's point of view.



Additional Suggestions

As we have to choose one feature that will help our app to be more effective in the form of more unique and feature wise more functional.

So as per my knowledge I have decided to proceed with the feature which I think is best is using the feature of the fitness app and plus we will be behaving in a chatting box where we can share our location, pics, video, calling, messaging within our group or with a single person also.

The main feature will be the fitness tracker, in this what we can do is that we can tie up with one of the fitness companies like fit-bit, Mi etc. and we can ask them for a fitness band and that band we will provide to our clients and customers. Or else we can develop a feature in our app like the health app which is there in the iPhone so we can develop such a function in our app, and we can ask our client to download it on their mobile.

This will help an individual person to track his fitness and we can mention our health issues if we have any. So that this app will track all our data, how much Km we traveled and all the physical exercation we had. Also, by using this app it will also let us know the traffic updates and give us the notifications about it, so that we can schedule or change our plan accordingly.

1) According to business point of view the advantage is, if we use this feature our partner will also help us to promote our business and he can also ask his client to avail our service if they want to travel.

2) The second option is we can also do a tie-up with the hospitals that if any client has any emergency in that case by using this app, they can see in our app the nearby hospitals and can directly go there.

3) All our partners and customers can also do the mouth publicity of our service as well as our product.

4) Our companies share value can also get better by introducing this feature and indirect marketing can also be done as our partners will also post and recommend this feature to their clients.

5) In today's world the impact of social media is very impactful so this feature we can promote on our social media handle and ask our clients to tag, repost, share due to which our name and brand will become famous.

In this way we can do promotion and due to which our app will get famous and we will earn more value like money ,fame ,and brand name.

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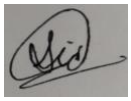
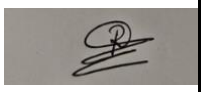
Kaleel, S. B., & Harishankar, S. (2013). Applying agile methodology in mobile software engineering: Android application development and its challenges. *Computer Science Technical* Reports, 1-11.

Group work Proforma

Team Member	Student ID	Individual overall work contribution (%)	Additional notes on task description	Signature
Student: Trevor Kiggundu	001001720	25	-Task A: Root Definition and CATWOE -Task B: Rich Picture and Discussion of Stakeholders	
Student: Ajinkya Vyawahare	001143935	25	Task G and H	
Student: Siddhesh Surendra Khadye	001132119	25	Task C: System Development Methodology Task D: Use Case	
Student: Rubel Mahmud	001031804	25	Task E: Conceptual Class Diagram Task F: Sequence Diagram	
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PART B: INDIVIDUAL SECTION

COMP1429: Systems Modelling Individual Work

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April 2021

A report submitted in fulfilment of the requirements for the module, Systems Modelling, Computing and Information Systems Department, University of Greenwich.

Word Count (Excluding questions and references): 1487

1 Personal Reflection

1. **Your assessment of the overall process as carried out by your team (e.g. rationale, design issues, areas you could have placed more attention to) and of the team dynamics and functionality (e.g. whether your cooperation was effective; what went wrong if anything; how do you feel you should have addressed sour points).**

The overall process started off quite sour to be fair. It was hard to establish a communication medium with the other team members, as they were not responding to my messages despite seeing and reading them. Cooperation was not effective at this point, and I felt like I had to take the lead in the group to avoid any more delays from affecting our grade, as it was a 70% group based assignment. I have taken the lead in other projects as well this term, as I do believe that it will help me in the corporate/industrial world. In addition to this, a few team members were aware of the other's circumstances and did not tell me, and it's difficult to proceed with a project in which not everyone is on the same page. This project definitely showed me the importance of different communication mediums, and the fact that different messages need to be delivered via different sources depending on the importance and sensitivity. I found that my team members were much more engaged via Teams meetings, compared to text messages, where it's easier for individuals to hide. It also opened my eyes to the difference in culture between myself and the other team members; I am from a more westernized background, and I am capable of taking criticism/confrontation well. My group members? Not as much. I learned that the hard way, but the other modules, such as 'Outsourcing and Organizational Awareness, Project Management, and Strategic I.T. helped me to realize my biases and mistakes. I do feel like it was not the best idea for me to solve the problem by trying to run away from it and leave the group; that was my mistake. I am glad that I was able to go through this experience, as it showed me what needs to be done when projects go wrong, and no project is perfect. A large amount of change management had to be carried out during this project, and I am glad that I reached out to the lecturer, Joseph, so that he could guide me through the steps to increase the team engagement. At the time of writing this, we have not submitted the assignment yet. However, I am much

more confident in our ability to provide a higher quality of work compared to this time a few weeks ago. I hope all goes well.

2 Software Development Questions

2. The report should also include complete and detailed answers of the following questions. Your answers should provide a thorough and critical review of the literature with references provided where appropriate.

(a) Software development has in general been characterised as a period of great risk.

i. Explain why understanding and modelling of the problem is important for finding a good design solution. How could Soft Systems methodology (SSM) be used to help the analyst to undertake analysis and design?

Software engineering involves a set of inherent difficulties that will always make the development process risky. These are complexity, conformity, changeability, and invisibility; one of these difficulties, 'invisibility', or the idea that software is "invisible and unvisulizable" (Brooks, 1987), is most prevalent here. Understanding and modelling a problem is important in this regard, as it helps to 'visualize' software, which unlike hardware, cannot be changed or physically modified. Modelling is an important part of system design, as it helps for stakeholders to agree on a design for a system, as this is also often miscommunicated during the project planning stage. Models also help to clarify what existing systems do in comparison to new/proposed systems, outlining their "strengths and weaknesses" (Somerville, 2015) and helping to determine requirements for the new system.

Models are also an important and often overlooked part of software testing. They are all too important in this regard, as they ensure that no glaring mistakes have been made regarding the design of the system. Software will always have its issues, but it is important to keep these issues to a minimum, so that they do not cause too many disruptions. The inability to properly identify, assess and/or mitigate these risks can lead them to become issues that negatively affect the scope, quality, time constraints and overall cost of the system, potentially damaging the relationship among stakeholders.

Models can also be made "quickly and cheaply" (Ryan, 2011), especially during modern times with the various modelling tools freely available online, and for purchase. This has made the task of system modeling easier than ever before, as the task of system design is heavily automated now, compared to 40-50 years ago. Almost anybody can do it with the proper preparation and practice. This however, also means that there are higher consequences for modelling mistakes, as they have become such a huge staple of system design.

Soft Systems Methodology (SSM), is a systems research tool in which models of "human activities" (Checkland, 1999) are used to assess the problem areas in system development, in order to create a more holistic view of the decision making process while undertaking the task of system design and development. SSM is important, as it alleviates some of the difficulties that the 'human element' brings into the process of system design, as stakeholder opinions will always vary. SSM encourages a more collective approach within the organisation, and provides a more structured approach to the design process. This is primarily done by doing the following processes: drawing the richest possible picture of the situation, and developing a relevant root definition for the change process at hand. The CATWOE acronym is also used to provide a larger insight of the stakeholders, processes and issues that the developer should be aware of.

This helps the analyst undertake the design as the stakeholders view is always heavily considered, as they will probably be the main user of the final product. Software is also made for one reason; to be used. It is important for developers to use tools like the Soft Systems Methodology (SSM) to ensure that the software they make is as functional and usable as possible.

ii. Discuss why traditional structured systems analysis and design (SSAD) is argued to be of less and less relevance as systems become more interactive, flexible and more component-based as opposed to OOAD.

Traditional approaches, such as structured systems analysis and design (SSAD) have been around for much longer than newer systems like object-oriented analysis and design (OOAD), and there seems to be a general consensus within society that 'newer is better'; SSAD is not immune to this phenomenon. There seems to be a desire for more agile approaches to systems development, as they rely less on having a fixed structure, and more on flexible and changing requirements. Even non-technological business companies have found themselves leaning more towards object-oriented design, as it allows the development team to understand and "model all of the requirements of the system" (Hammad, 2020) much more effectively. Regarding the task of software development however, using the OOAD approach allows the development team to chip away at one of software engineering's inherent problems; the fact that it is 'invisible'. It also addressed another issue regarding system development in stakeholder management, as it is often difficult to gauge exactly what a consumer wants from a system. OOAD helps to tackle these

difficulties by introducing more interactive tools for requirements engineering, such as “use case models and state-chart diagrams” (Hammad, 2020). These give a much better insight into the views of all stakeholders than SSAD tools do, as those have often been viewed as a ‘one size fits all solution’. Project requirements can also be defined much more effectively, and even altered later on if need be, due to the iterative nature of the OOAD process; this is something that SSAD does not do, as requirements are quite often well-defined early on in the process. Overall, the OOAD approach is a lot more mercurial than the SSAD one, but if implemented correctly, it has a lot of benefits that the latter does not compare to.

iii. Critically discuss the weaknesses and benefits of agile methods and traditional staged methodologies for software development. Contrast the two approaches and in doing so identify any strengths and weaknesses of the methodologies in your answer.

A few of the comparisons made between the OOAD and SSAD approaches also apply to the general Agile and Traditional Staged methods, as the former is newer and much more changeable than the older latter method. A table has been provided to better display and understand the strengths and weaknesses of both methodologies, as well as stay within the word count:

Methodology	**Strengths**	**Weaknesses**
Traditional Staged	-Favorable for longer term projects, less complex projects: Great for projects in which all goals, values and costs are pre/well-defined. -Linear approach with well-defined processes: Stakeholders know what is to happen, exactly when it is to happen (step by step process).	-Does not involve clients as much: lacks appropriate stakeholder engagement that is necessary for modern systems development. -Lack of transparency within the project team: Decisions are often made at the top of the power chain, so lower members of the team are often left out of important processes, and only ‘play their role’.

Agile	-Better for shorter, more iterative and complex projects: Allows for a much more flexible approach to the task at hand. -Customer engagement: Clients are heavily involved within the development of the system. -Risk and problem management is carried out collectively: The entire team works together to solve any issues that arise.	-Less focus on the formal and directive processes: Stakeholders might get carried away due to lack of proper structure. -Not ideal for larger, long term projects, as processes are not well-defined. -Less planning and task prioritization: This can lead to problems if the team gets carried away within the project.

3 References

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