

# ASSIGNMENT COVERSHEET

## UTS: ENGINEERING & INFORMATION TECHNOLOGY

<b>SUBJECT NUMBER &amp; NAME</b>  31257 Introduction To Software Development	<b>NAME OF STUDENT(s) (PRINT CLEARLY)</b> Oliver Sarker Leon Salsiccia Sam Stephens Olivia Pham	<b>STUDENT ID(s)</b> 13636838 13550494 13027216 13634124
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<b>NAME OF TUTOR</b> Juan Castilla Rho	<b>TUTORIAL GROUP</b> Tutorial 7	<b>DUE DATE</b> 3 June 2020
<b>ASSESSMENT ITEM NUMBER &amp; TITLE</b> Assignment 1: IS Development Methodologies – 31257 Autumn 2020		
<p><input checked="" type="checkbox"/> I confirm that I have read, understood and followed the guidelines for assignment submission and presentation on page 2 of this cover sheet.</p> <p><input checked="" type="checkbox"/> I confirm that I have read, understood and followed the advice in the Subject Outline about assessment requirements.</p> <p><input checked="" type="checkbox"/> I understand that if this assignment is submitted after the due date it may incur a penalty for lateness unless I have previously had an extension of time approved and have attached the written confirmation of this extension.</p> <p><b>Declaration of originality:</b> The work contained in this assignment, other than that specifically attributed to another source, is that of the author(s) and has not been previously submitted for assessment. I understand that, should this declaration be found to be false, disciplinary action could be taken and penalties imposed in accordance with University policy and rules. In the statement below, I have indicated the extent to which I have collaborated with others, whom I have named.</p> <p><b>Statement of collaboration:</b></p> <p>Signature of student(s) <u>O. Sarker, O. Pham, S. Stephens, L. Salsiccia</u> Date <u>02/06/2020</u></p>		

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## ASSIGNMENT RECEIPT

To be completed by the student if a receipt is required

<b>SUBJECT NUMBER &amp; NAME</b>	<b>NAME OF TUTOR</b>	
<b>SIGNATURE OF TUTOR</b>		<b>RECEIVED DATE</b>

# Assignment 1 - Analysis, Planning, Architecture, & Design

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## Group

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Tut 07 Juan 12:00pm

Oliver Sarker (13636838)

Leon Salsiccia (13550494)

Olivia Pham (13634124)

Sam Stephens (13027216)

Link to video presentation: <https://youtu.be/3pXtNggtEtE>

## Problem Definition

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The Call Management Centre current operations are impacted due to the high number of holiday packages and difficulties in effectively converting customers to make a purchase. These problems include; unacceptable wait times for customers, Relationship Managers lack of information regarding the customer or their interested holiday package, and inefficiency in redirecting customers to Relationship Managers who are able to help. This has resulted in slow call rates, organisational resource wastage and negative customer relationship with the company. Relationship Managers are not able to fully understand customer intentions resulting in customers being redirected multiple times or simply hanging up.

## Project Objectives

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The goal of this project is to address the existing problems surrounding the current operations of the Call Management Centre, and suggest an improved solution in the form of a new information system. The suggested solution will further enable the Call Management Centre in its ability to manage customer enquiries and calls, and Relationship Managers in making holiday package sales. Additionally, the new system will allow the travel company to target potential customers or retarget existing customers as a result of the improved information processes.

## Stakeholders

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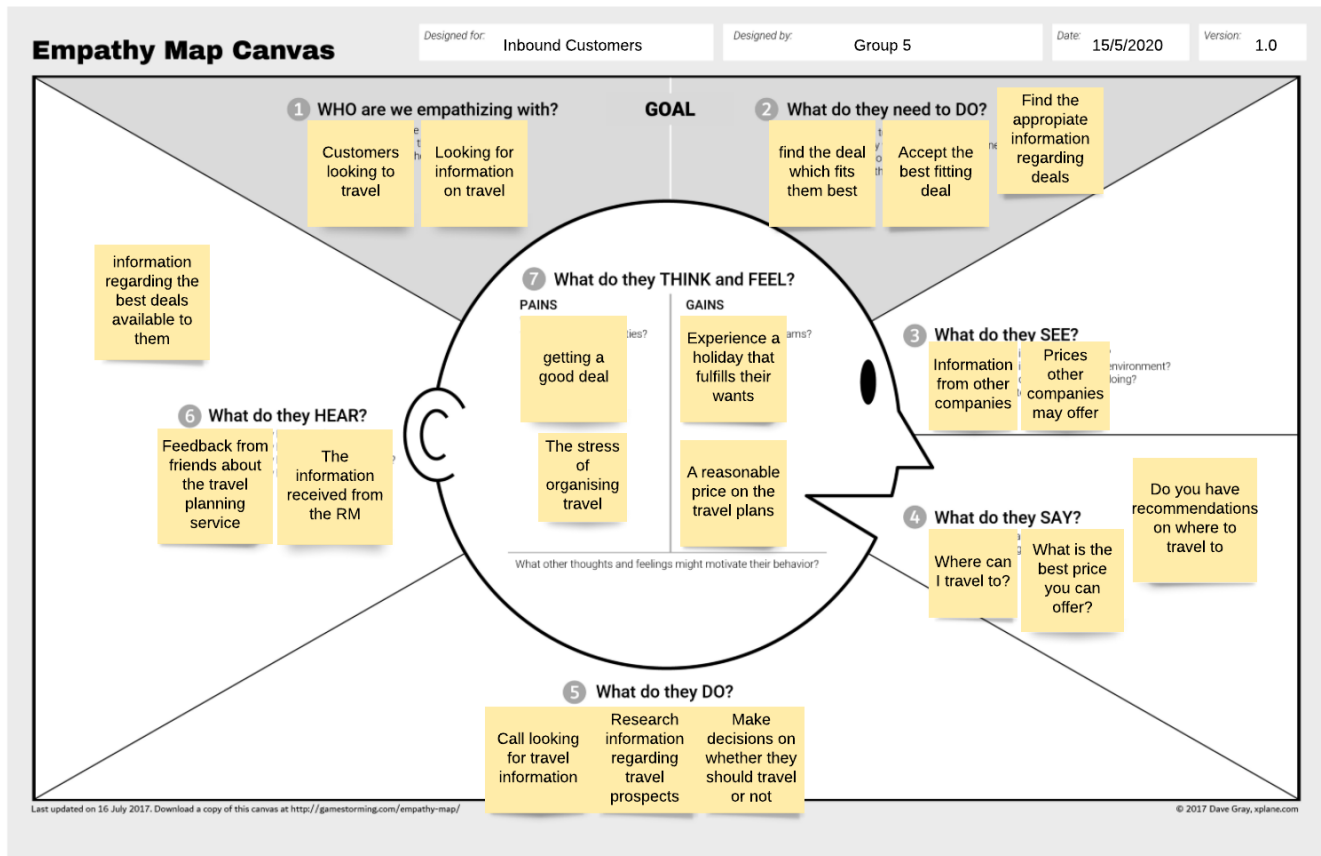
1. **Inbound Call Customer:** Customers calling the travel company to purchase or get information about a travel package
2. **Outbound Call Customer:** Potential customers called by the travel company
3. **Relationship Manager (RM):** Employees who talk to customers over the phone
4. **Call Centre Manager:** Manager of the department within the travel company that handles both inbound and outbound calls
5. **Travel Company:** The major travel company who maintains the Call Management Centre

## Design Thinking

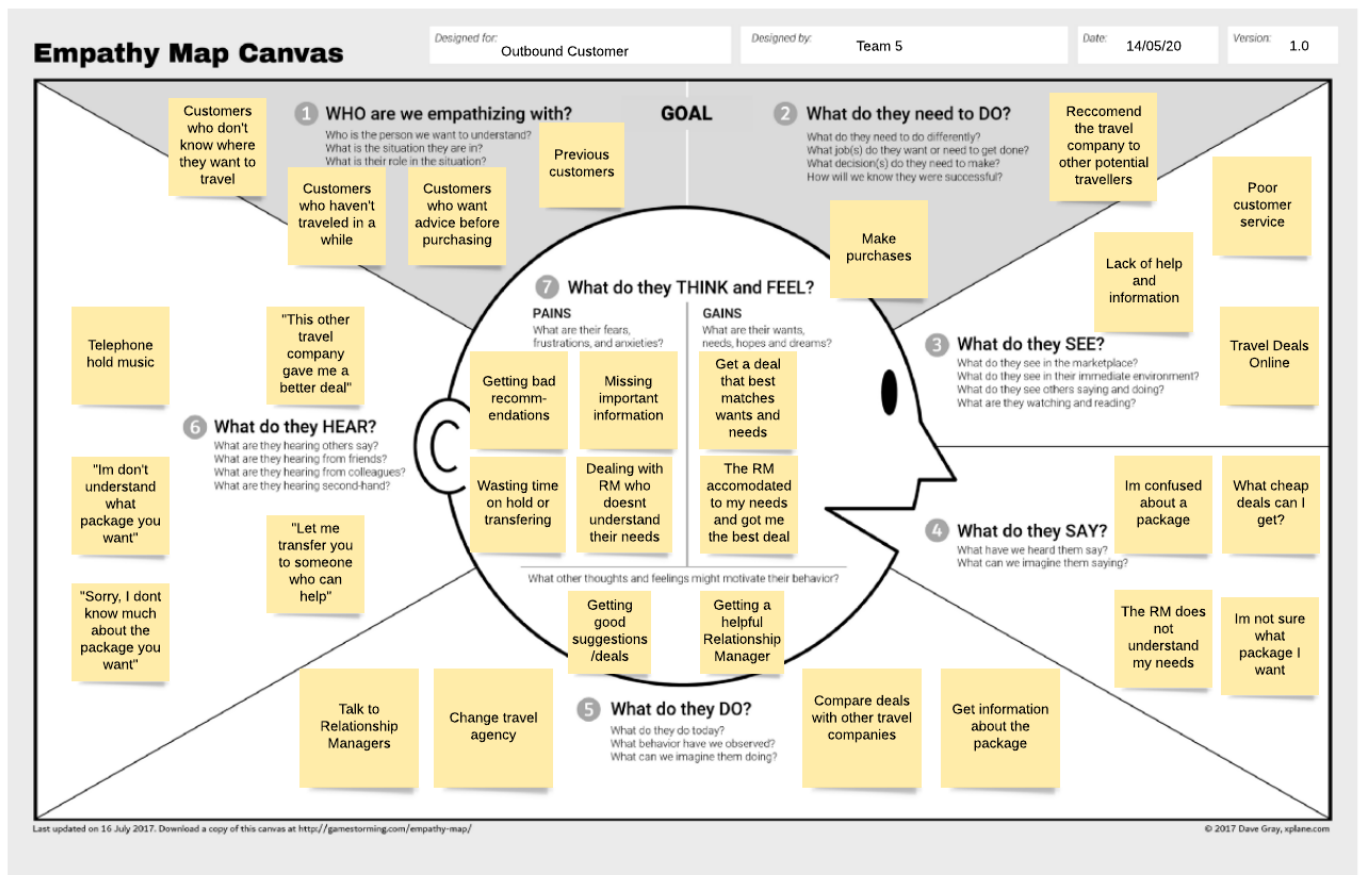
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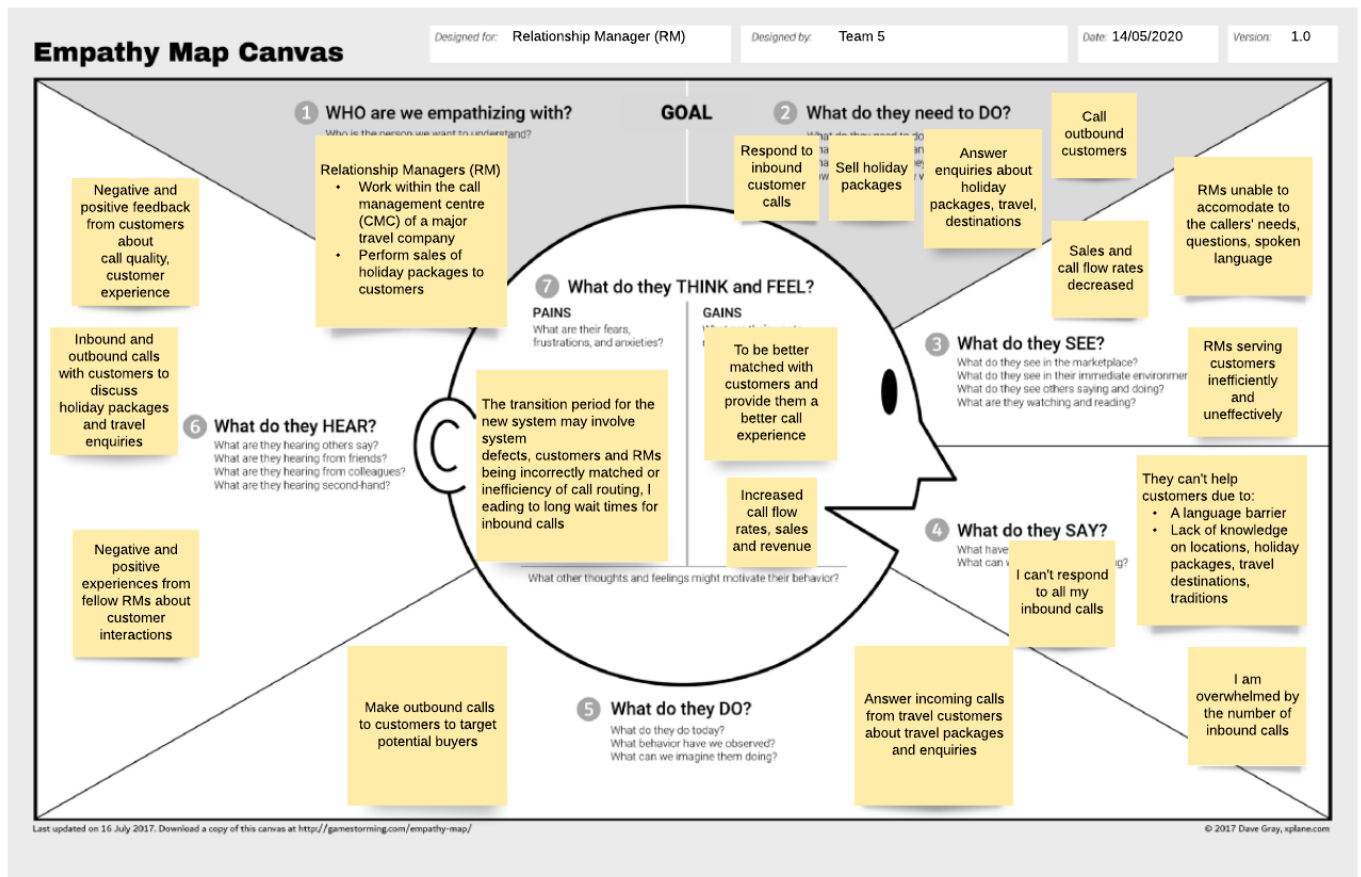
### Empathy Maps

## Inbound Call Customer



## Outbound Call Customer





## POV Statements

1. Relationship Managers need to be routed to potential customers based on skill levels and best match so the number of calls RMs have to take is reduced.
2. Outbound customers need to be matched with a Relationship Manager who is best fit to discuss the proposed product for the customer.
3. Inbound customers need to be matched with Relationship Managers according to their inquiry so they can receive help and purchase a travel package more efficiently.

## Design Approach Reflection

This development project began with reading over the assigned case study and applying to it the first stage of Design Thinking: Empathise. From the discussion topic we defined the stakeholders involved with and affected by the implementation of a travel company call routing system.

We created empathy maps for the major stakeholders who we believed would be most affected and have the most perspective on the changed system. Our empathy maps were created for inbound and outbound customers and the Call Management Centre Relationship Managers. Alongside our empathy maps we created corresponding POV (point of view) statements which defined the stakeholders' needs and perspectives in relation to the call system.

From the empathy maps and POV statements, we've been able to define the problem as part of stage 2 of the Design Thinking process. We've determined that for customers, it is important to decrease wait time for calls and for them to be matched with an RM suited to their needs and questions. For RMs, it is important to be well matched with customers to best address their needs.

Following this we developed 'How might we?' (HMW) questions. These questions are shaped from our POV statements and frame our brainstorming and ideation phase:

## HMW (How Might We) Questions

1. How might we improve customer retention and satisfaction.
2. How might we increase the rate of calls.

3. How might we increase the quality of our Relationship Managers' service.
4. How might we better consolidate our customer profiling tools.

We then listed our assumptions that were not explicitly stated in the case study:

Assumptions

- The user profile is created with a Profiler Tool via the travel company website.
- The user provides their profile ID during the call to identify them.
- Outbound Customers are contacted based on RM Skill matrices and product knowledge.
- Outbound Customers have an existing profile with the Travel Company.
- A booking can only include a single holiday package.
- Inbound calls from new customers without a profile will require them to declare the intent of their call via speaking to an AI assistant. Once intent is known, the new customer can be routed to an appropriate RM.
- All inbound calls are filtered by the new system.
- All outbound calls performed by RMs are taken from their target list.
- The Interactive Voice Response unit will redirect the customer once an appropriate Relationship Manager is available.
- The target customer list is generated and used in the backend. RMs simply initiate the outbound call which is dialled automatically by the system according to the target list.
- Relationship Managers will book the holiday package on behalf of the customer.

Applying the initial stages of Design Thinking to this project has allowed us to better understand the project scope, our design objectives and empathise with our stakeholders' needs and wants. Design Thinking stages 1 and 2 have set a foundation for us to proceed with the prototyping and modelling stage of our project. Understanding our objectives has helped us to create and prioritise our backlog, which is managed using *Issues* on GitHub (See Backlog section below).

Agile Development Methodology

SCRUM Reflection

SCRUM is an agile framework for developing solutions in iterations. We applied the SCRUM framework throughout this project in order to breakdown our tasks into smaller, more manageable fragments which we could track. This ensured the development of the project went smoothly and was successful.

The SCRUM method involves dividing up and working on multiple smaller tasks simultaneously in rapid succession, referred to as *Sprints* . We would identify these Sprint activities and assign them to group members. After a Sprint, the group would communicate back any pain points the faced while working on their tasks in what is known as a *Sprint Retrospective* . This allowed for frequent communication and collaboration amongst the team. These meetings were held bi-weekly; one on Tuesday and another on Friday. Within these meetings, feedback was shared and new work was assigned to each member.

GitHub was also used to enable our SCRUM Methodologies. We used GitHub *Projects* feature to create and maintain a Kanban board in order to track the progression of work completed. We created a Sprint backlog, consisting of the tasks required for the reports completion, using GitHub *Issues* feature. This also allowed us to assign tasks to each other and comment on each Sprint backlog item.

Backlog

US	As a	I want to	So that I	Priority
1	Inbound Customer	be able to quickly purchase a holiday package	can go on holiday	High
2	Inbound Customer	receive quick and sound advice/options on travel options	can make an informed decision on the travel options	Medium
3	Inbound Customer	be directed to a employee quickly	spend less time waiting on hold	Medium
4	Inbound Customer	be able to provide my customer ID	can be served based off my previous purchases and interests	High

US	As a	I want to	So that I	Priority
5	Inbound Customer	be able to explain why I'm calling	am directed to someone who can help faster	Low
6	Outbound Customer	only receive calls about packages I would be interested in	don't have my time wasted	Medium
7	Outbound Customer	be able to opt out of getting calls	don't get spam calls	Low
8	Outbound Customer	be recommended packages based off my interests	find new places to go on holiday	High
9	Relationship Manager	be matched with potential customers based on my skills	can best address their needs and interests	High
10	Relationship Manager	be able to view customers details quickly	have the necessary information when selling a package	Low
11	Relationship Manager	be able to contact potential customers according to my knowledge	can sell holiday packages more efficiently	Medium
12	Relationship Manager	have a dialogue script generated per call	easily provide the necessary information to the customer	Medium
13	Relationship Manager	be connected to customers more likely to purchase	don't waste time on customers who won't purchase	High
14	Call Centre Manager	ensure the system uses AI to interact with customers	can more easily manage inbound call performance	Low
15	Call Centre Manager	ensure the rate of calls is manageable	ensure RM's aren't over worked	Medium
16	Travel Company	retarget existing customers with new packages	make more sales	High
17	Travel Company	target potential customers with offers that would best appeal to them	can make more sales	High
18	Travel Company	ensure our most loyal customers to be prioritised and served first	can uphold a higher customer reputation	Medium

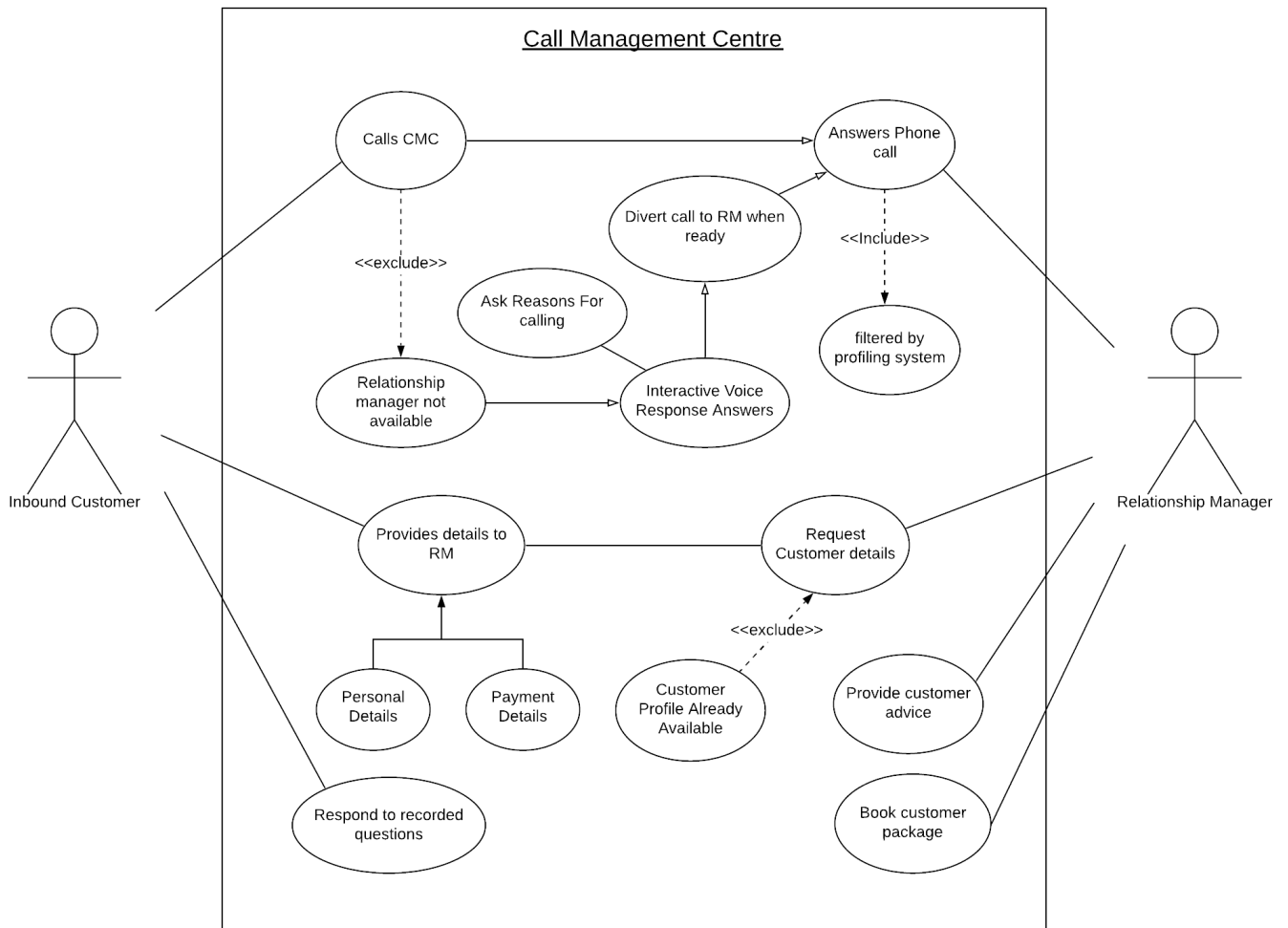
## RUP Models

### Use Case Diagram

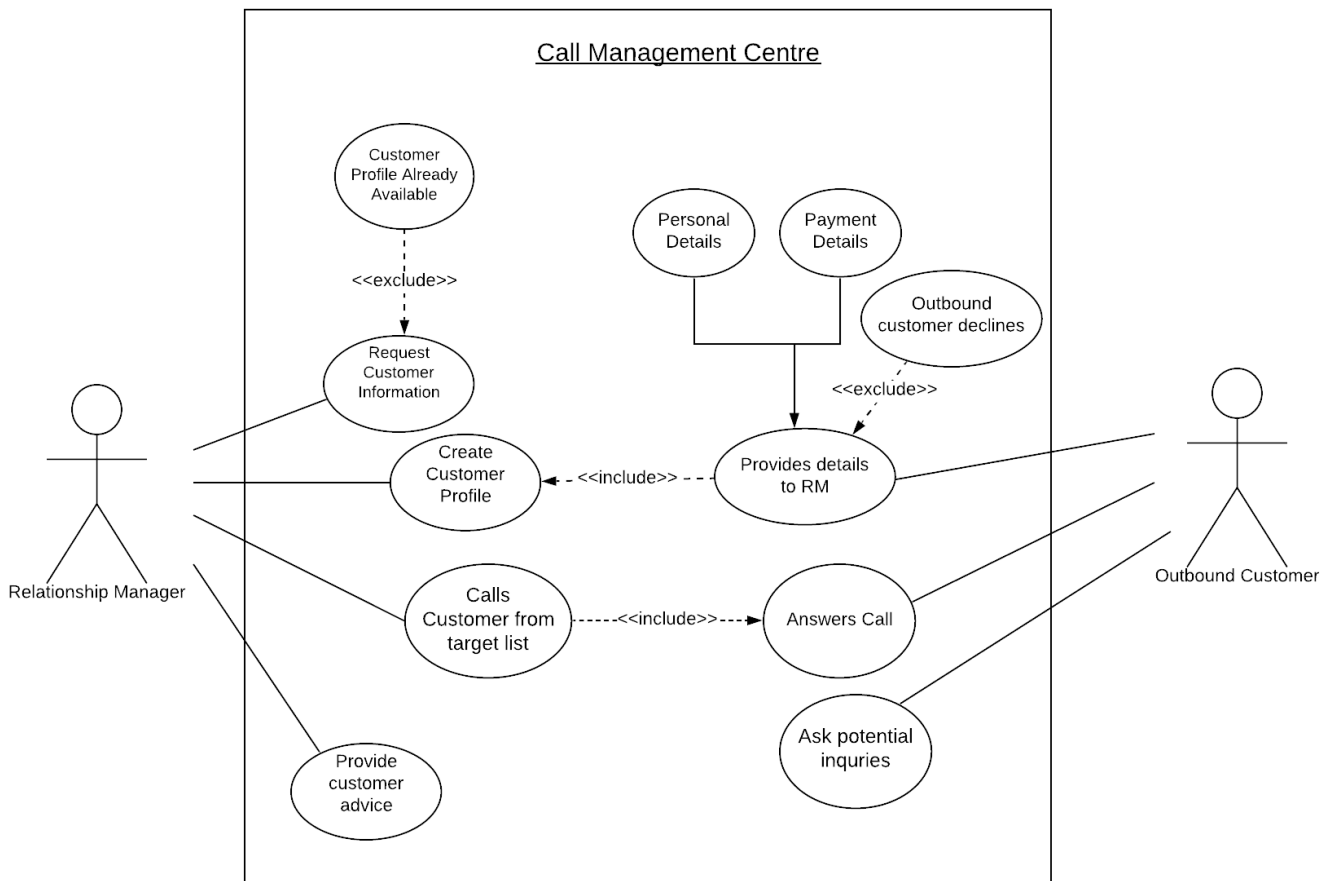
The utilisation of use case diagrams enables for a simplified view of users' interaction with the system. Two separate use case diagrams were created, one for each type of call situation. The inbound diagram depicts how a customer who is calling the travel company will interact with the system, and the respective relationship manager. Alternatively, the outbound diagram details the occurrences of when the travel company will make an outward call to customers or potential customers.

Many iterations of these diagrams were created. Predominantly for the inbound caller, this is because it took multiple attempts and edits before we agreed that the diagram gave sufficient detail. Whilst the outbound caller diagram proved more straight forward and simple.

### Inbound Use Case Diagram



## Outbound Use Case Diagram

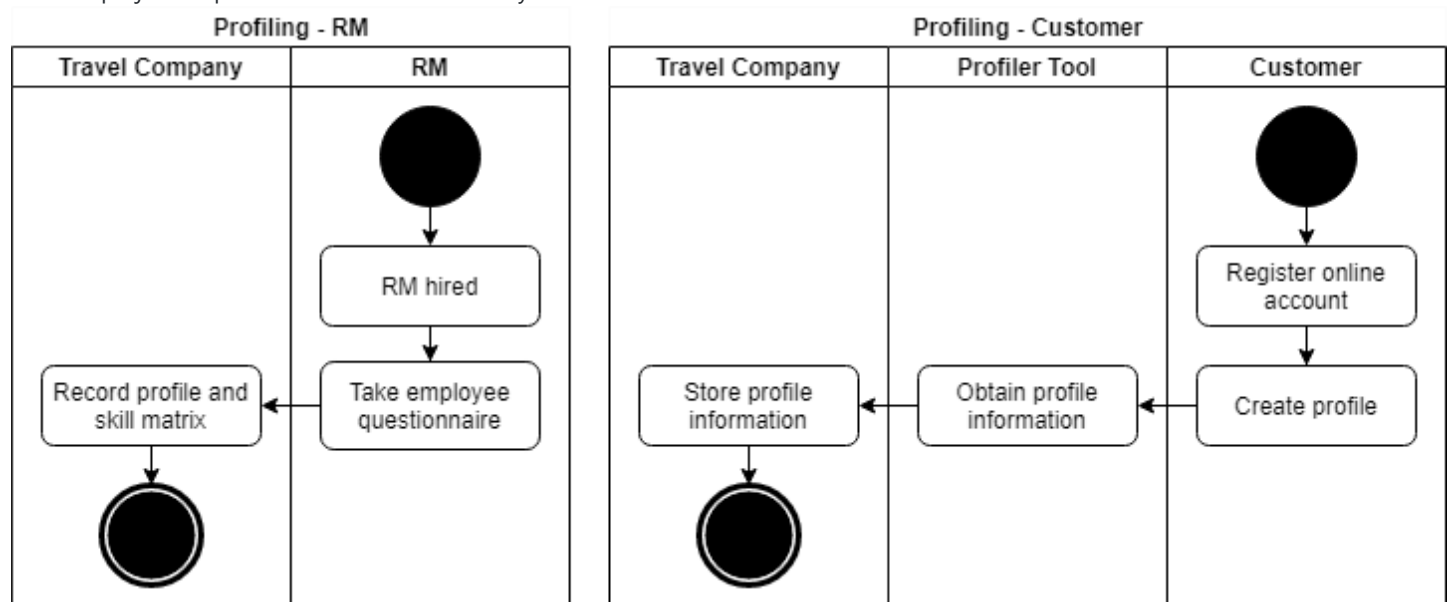


## Activity Diagram

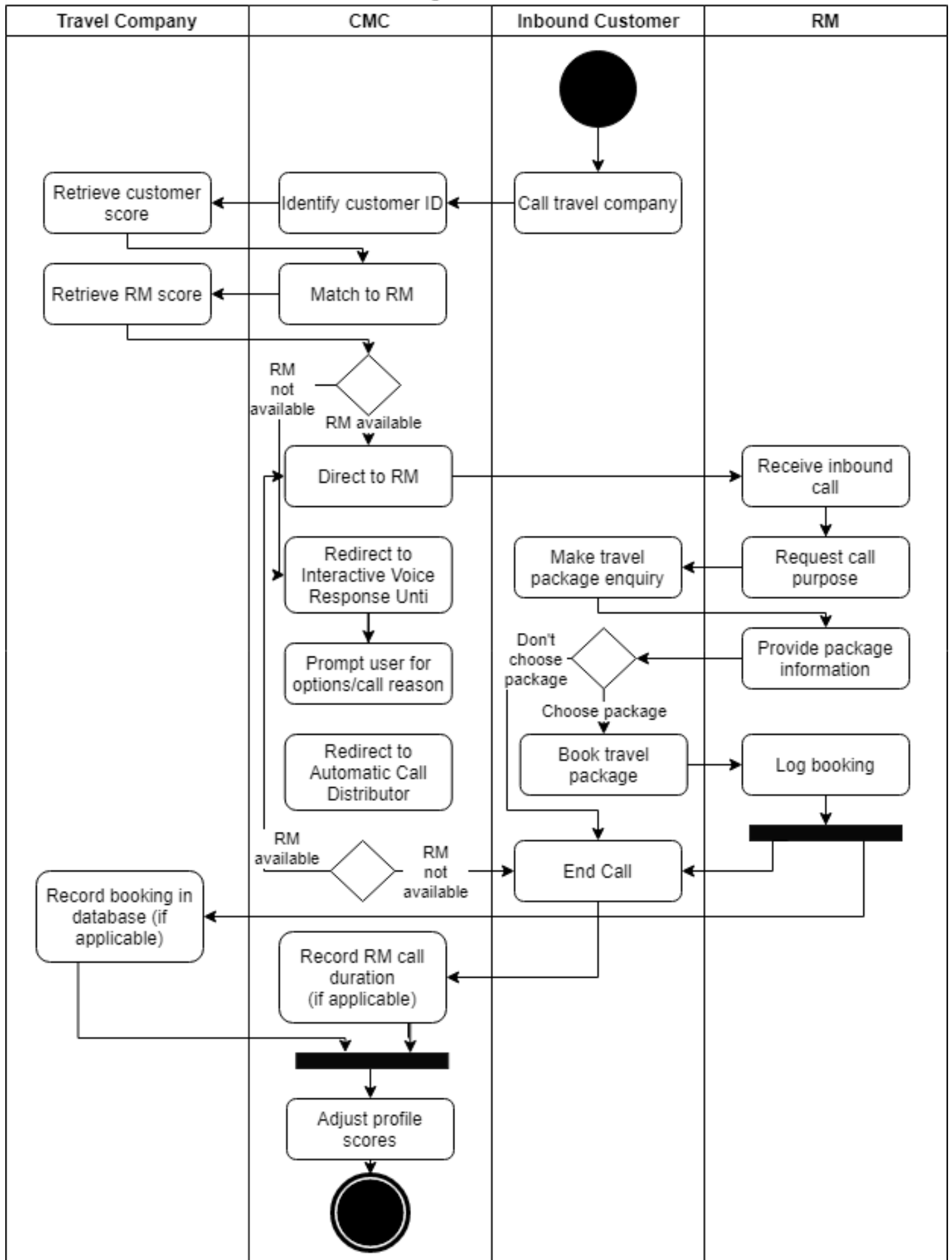
The activity diagrams were created to model the process of creating a user profile in the perspective of the customer and relationship manager and the process of call rerouting for inbound and outbound customers. The activity diagrams show the dynamic workflow of sequential and concurrent activities within the system.



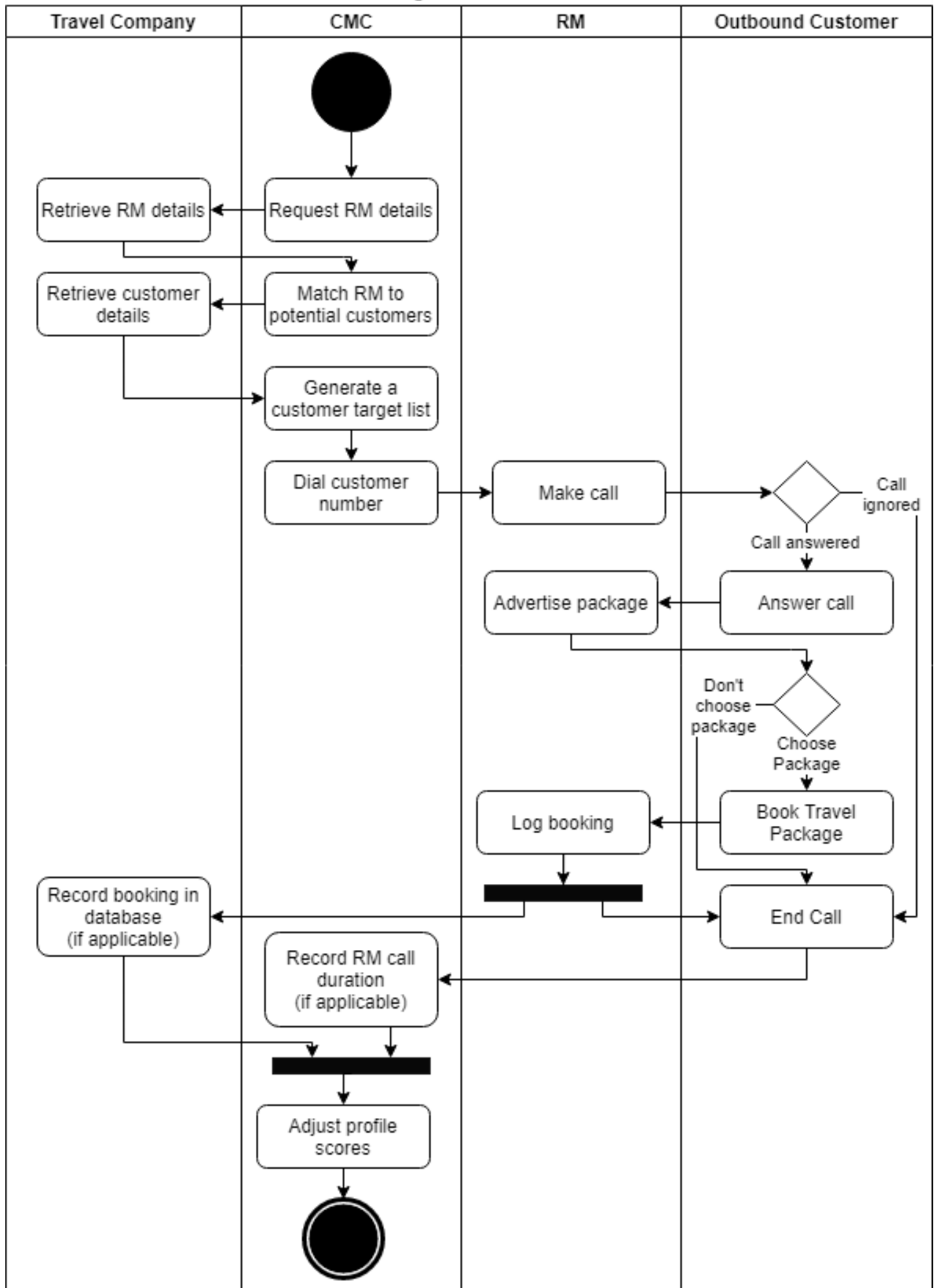
Creating the activity diagrams involved making several adjustments and additions as the group needed to confirm all the aspects of the system that needed to be modelled. However after consulting with the group and tutor, we created our final models which were consistent with the project scope as well as succinct and easy to read.



# Call Routing - Inbound Customer



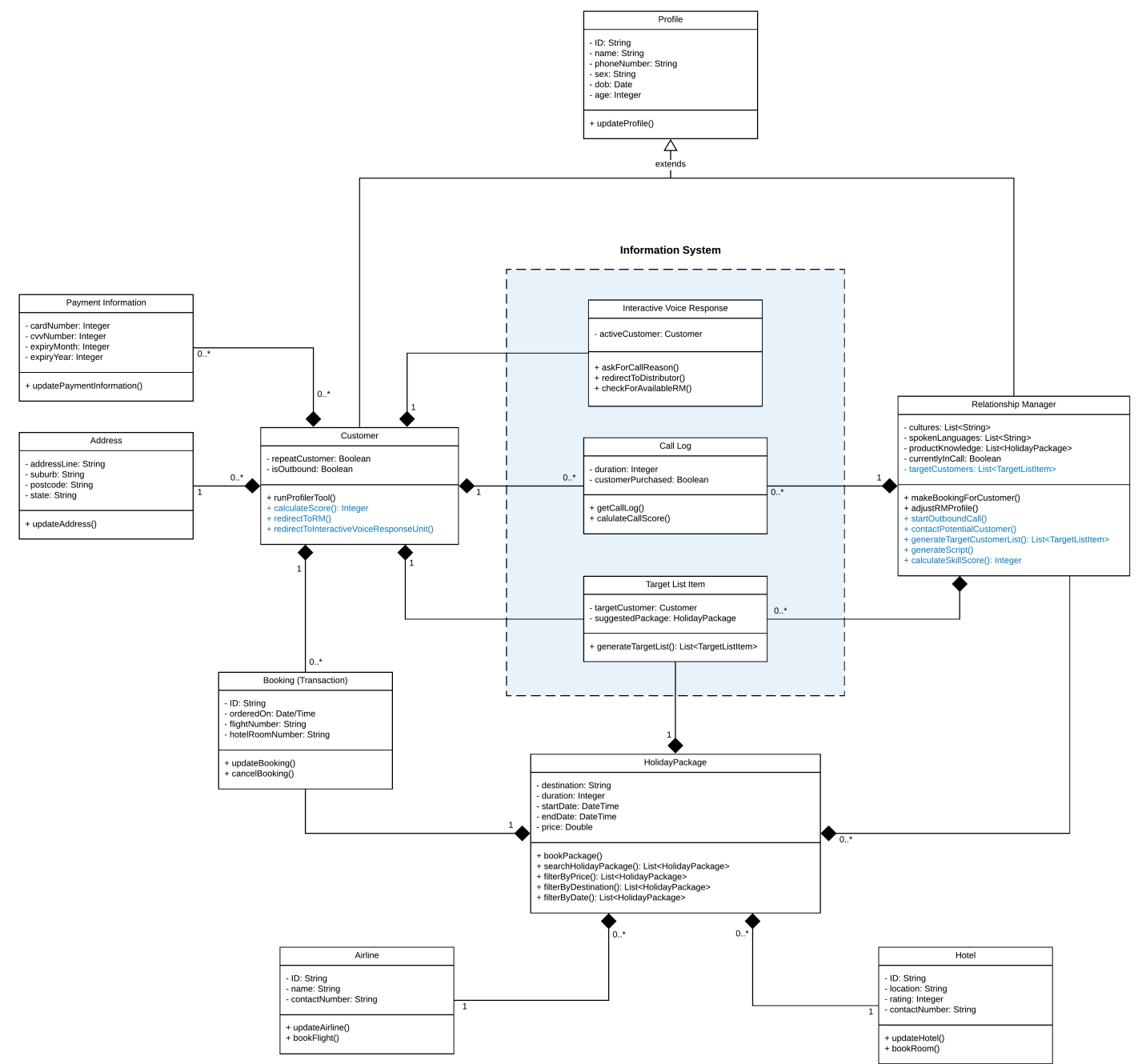
# Call Routing - Outbound Customer



Class Diagram

A class diagram was created to illustrate the proposed system's classes including their properties, functionalities and relationships. The class diagram below is a combination of the proposed information system along with the base system which it was built upon. We have colour coded the new aspects of the system blue, making it easy to determine new functionality that was added by the information system.

The class diagram undertook multiple iterations before we were satisfied with the result. This was due to the group being unsure what aspects of the system needed to be modelled. We also weren't sure what should be modelled as a class or as a method. We decided to model the new systems functionality across a combination of new classes and new methods in order to create a model we thought provided excellent depth while maintaining legibility.

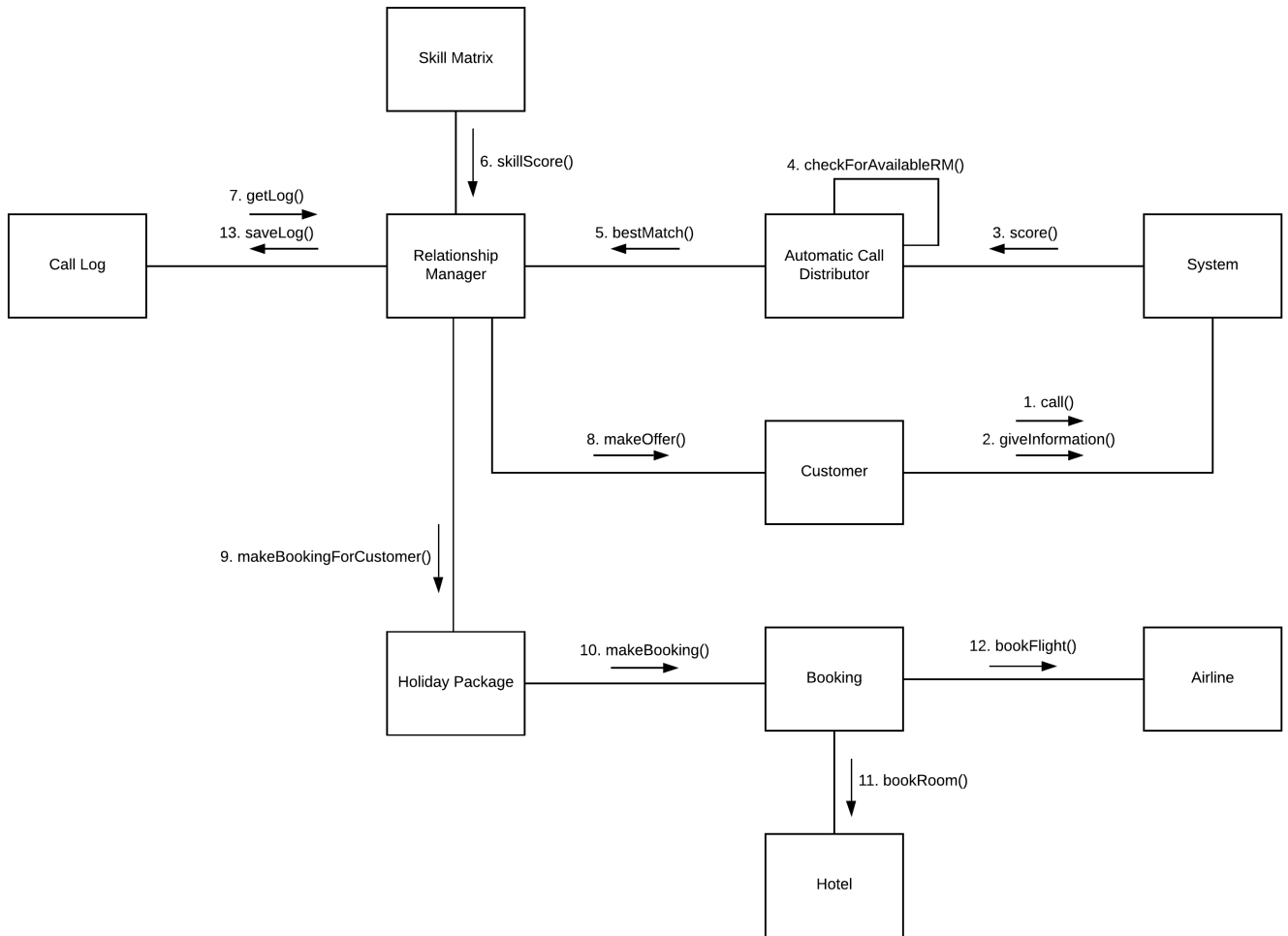


Collaborative Diagram

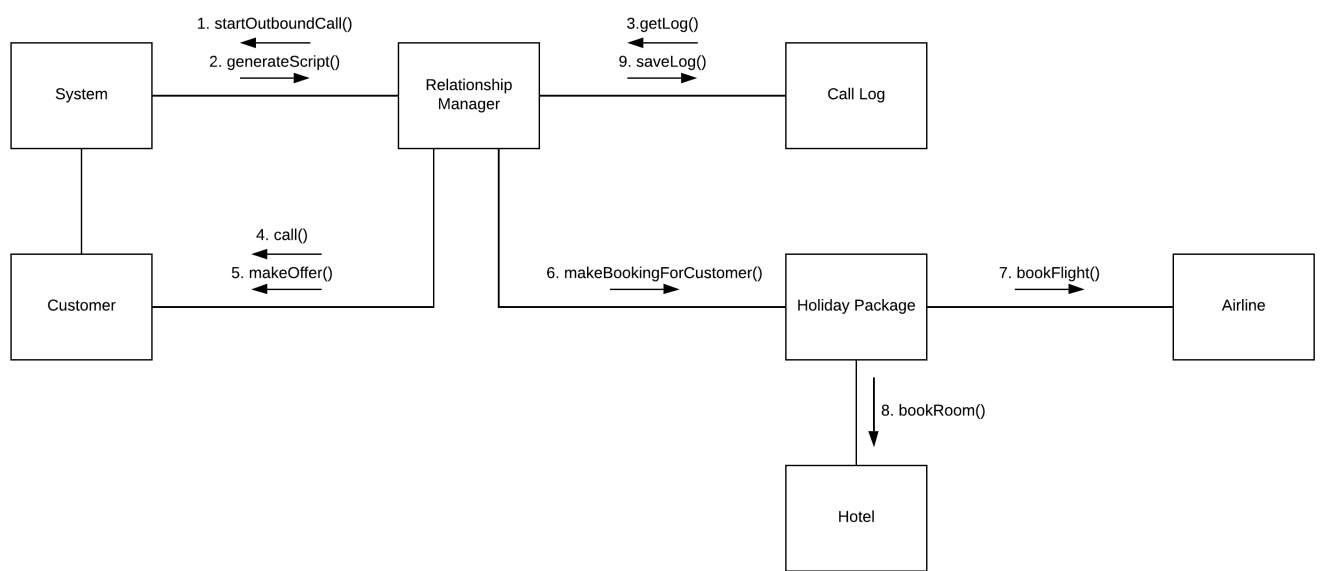
A collaborative diagram is a visual representation to illustrate the interaction between objects within a given use case. The diagram highlights the structure of interactions.

The collaborative diagram was originally a single illustration, however, due to the structure of the Travel Company and how calls are distributed between differing customers, the diagram was divided into two diagrams, Inbound and Outbound customers. Each diagram below shows the structure of a given call and transaction that occurs between a Relationship Manager and a Customer.

Inbound



Outbound



Project Evaluation

Competitive Advantage

The new system proposed to the Travel Company will improve the efficiency of the transaction that occurs between a Customer and Relationship Manager. By streamlining the automatic call distribution functionality, customers can expect shorter call wait times and a reduced number of transfers. The system will also allow for the Travel Company to retarget existing customers with suggested holiday packages according to their profile and preferences. Furthermore, the effectiveness of targeting potential customers via outbound calls will increase as a result of improved information processes. A combination of the above will result in a better experience for both customers and Relationship Managers alike, ultimately leading to an increase in customer satisfaction and sales.

Additionally, by improving the efficiency of the automatic call routing system, the workflow of Relationship Managers will be enhanced. This will also be supported by the introduction of the Interactive Voice Response (IVR) unit, which will alleviate the workload that was previously placed entirely upon the call centre. Utilisation of the IVR in conjunction with an improved dynamic call router will enable the Call Management Centre to be self-sufficient for any number of incoming calls, reducing organisational resource consumption and operating costs.

Finally, the introduced system can be used as a foundation which the Travel Company can iterate upon through future projects. The information systems' functionalities can be extended to collect insights from profiles, interactions and other various data it collects. These insights can then be used to identify customer trends and patterns and improve existing business processes to provide a better service.

## **Possible Issues**

Although the suggested system provides many advantages, its implementation is not without risks. Like with any major development project, the Travel Company may experience difficulties during the systems' implementation. Some issues that may arise include increased project costs, unexpected delays or constraints, or a shift in resource allocation. Inadequate management of the projects' development may also impact the Travel Company in the form of additional funding or time constraints.

Moreover, as development progresses, alterations to project requirements may necessary, further increasing project costs. This can also lead to the reallocation of labour and increase the amount of time required for the projects' completion.

It is also necessary to consider issues that may arise after the implementation of the system. This may include Relationship Managers requiring additional training in order to use the new system, leading to increased organisational resource consumption.