

**Software Requirements Specification**

**for**

**Online Room Reservation System**

**Version 4.0 approved**

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## Revision History

Name	Date	Reason For Changes	Version
ORRS-V1	15/10/2018		V1
ORRS-V2	23/10/2018	Refining requirements, adding prioritization plot	V2
ORRS-V3	11/11/2018	Add non-functional requirements, adding traceability, adding system goal modeling, adding actor goal modeling, adding use case diagram, adding use case scenarios	V3
ORRS-V3.1	18/11/2018	Refined Goal Models, Traceability Model and Syntax according to the feedback 2	V3.1
ORRS-V3.2	02/12/2018	Added Class Diagram, Sequence Diagram and State Diagrams. Added few solution-oriented requirements with their diagrams	V3.1
ORRS-V3.3	08/12/2018	Refined Class Diagram, Sequence Diagram. Derived state diagrams from Class diagram. Developed solution oriented requirements from class diagram and state diagrams. Refined Goal modelling part and goal IDs. Added table for goals used in goal modelling. Traced solution oriented requirements back to functional requirements. Updated traceability model and traceability matrix. Refined scopes for each diagram presented.	V3.3

ORRS-V4.0	15/12/2018	Refined and clarified scope of Class, Sequence and State Diagrams. Prepared prototype for the system to present. Updated Traceability model. Prototype for the web interface has been created and traced back to the system functions.	V4.0
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Table 1 - Versioning

## **1. Introduction**

This section of the document provides purpose, system scope, list of definitions, acronyms, abbreviations & references.

### **1.1 Purpose**

The purpose of this document is to create a list of detailed requirements for Online room reservation specification (ORRS). This document will capture interactions between different internal web pages, environment scenarios of usage, constraints and Online room reservation system prototype

### **1.2 Intended Audience and Reading Suggestions**

This document will capture all stakeholders' preferences, different conflicts and their resolution. Also, it could be used by potential developers, design engineers, testers, project managers, etc. Eventually this document can be used while preparing user documentation.

This document will be proposed to different stakeholders for their approval and can be used as a reference guide in different phases of system development.

### **1.3 System Scope**

The scope of the online room reservation system is to create an online web-interface for the users to check the availability and book the room from any part of the world. This system will be an alternative to the traditional offline way of checking available rooms and book them. The scope of the sub-system which is described in this document is the user interface. The system will have two major types of users: customers and hotel manager.

User interface is part of already existing system ORRS, which is not going to be discussed here.

**Usage facet** – sorting, selecting, and reserving a room by customers. Updating room information and viewing reports by hotel manager.

**Subject facet** – entering different details to select and reserve a room at a hotel.

**Development facet** – GDPR, Terms and Policies and hotel’s internal policies to be considered.

**IT System Facet** – Hotel’s existing room reservation system, on which the user interface has dependency explained below.

## 1.4 Glossary

Acronym	Definition
ORRS	Online Room reservation system
OFR	Other Functional Requirement
User Interface	User Interface is the landing page where the customer can use the functionalities described in this document.
SYSF	Abbreviation representing System Function – used as a prefix of function IDs
API	Application Programming Interface
GDPR	General Data Protection Rules
PAGE	The term page is used to refer a component of the system (website) which accommodates different functionality across the website. For example, customer details page has functions that enable customers enter information, while payment page has functions regarding card details.
Precondition	the precondition realizing a functional requirement might be that the hardware meets a specific performance requirement
Post condition	Describing the state the system is in after all the events in the use case have taken place
Evolution	Satisfies – if artefact A is realized in the system, artefact B is realized as well
System	ORRS is referred as System. It is the all the functions that ORRS has including those not discussed in this document.

Table 2 – Definitions and Acronyms

## 1.5 References

- (n.d.). Retrieved from Agile Business Consortium:  
<https://www.agilebusiness.org/content/moscow-prioritisation-0>
- SRS IEEE Template. (n.d.). Retrieved from  
[https://web.cs.dal.ca/~hawkey/3130/srs\\_template-](https://web.cs.dal.ca/~hawkey/3130/srs_template-)

## 2. Overall Description

This section will provide overview of the system, its perspective and main functions.

ORRS- Online Room Reservation System serves as a website of a hotel, through which customers can check available rooms, select preferred arrival and departure dates and number of guests. They can enter their personal and card details, confirm booking. The system as a response sends a confirmation mail to them.

### 2.1 System Perspective

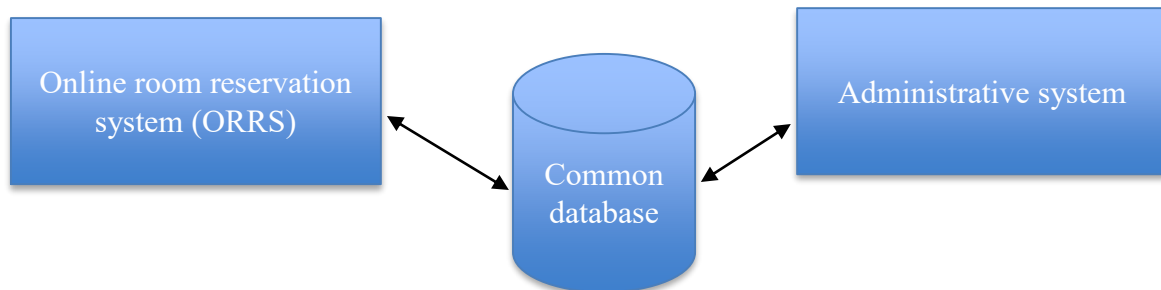


Figure 1 – System Perspective

The system considers customer and hotel manager perspectives. It has ORRS – where customers are able to book the rooms and use system functions described in this document, while for the administrative use there is a separate environment, where accounting, logistics and all relevant operations run. Both systems are based on the common database. They are integrated with each other, meaning the relevant data is exchanged.

The subsystem “User Interface” is an element of ORRS and it represents the web-interface for customer to book rooms online according to their choice of selection.

## 2.2 System Functions

### SYSTEM FUNCTION SHELL

VER.	Version of system function
SYSTEM FUNCTION ID	Unique identification code of system function
SYSTEM FUNCTION	Name of system function
DESCRIPTION	Description of system function

Ver.	System Function ID	System Function	Description
V1	SYSF1	Checking availability	Customer shall be able to check the availability of rooms
V1	SYSF2	Selection of room	Customer shall be able to view available rooms with brief details and price information
V1	SYSF3	Customer details	Customer shall be able to enter their details for communication purposes
V1	SYSF4	Payment page	Customer shall be able to enter payment details for authentication & room booking confirmation purposes
V1	SYSF5	Confirmation Page	Customer shall be able to view all entered details on confirmation page

Table 3 – System Functions

## 2.3 User Classes and Characteristics

### User characteristics

There are two user classes in ORRS: customer and hotel manager.

### Customer

Customer is the main stakeholder of the software intensive system. Customer would be able to check available rooms. Customer can select and sort rooms by price. Enter personal and payment details, as well as confirm booking. Customer input is required for making successful reservation.

### Hotel Manager



Hotel manager is the administrative stakeholder of the software intensive system. Hotel manager would be able to update the information about listed rooms, see reports and check the booking information.

## 2.4 Actor Dependency Models

It provides the visual description of a process about network of dependency relationships between actors

### Notations:

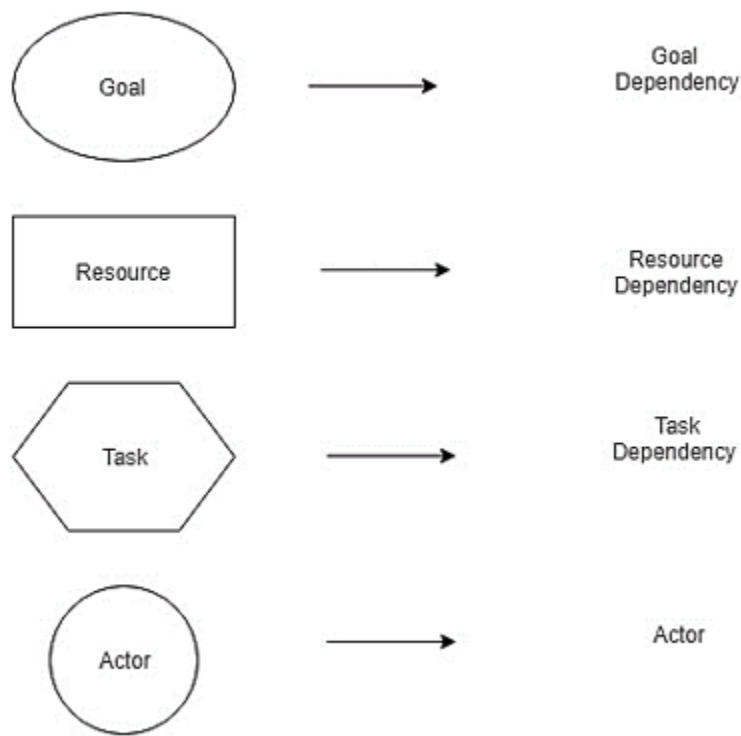


Figure 2 - Notations

Example:

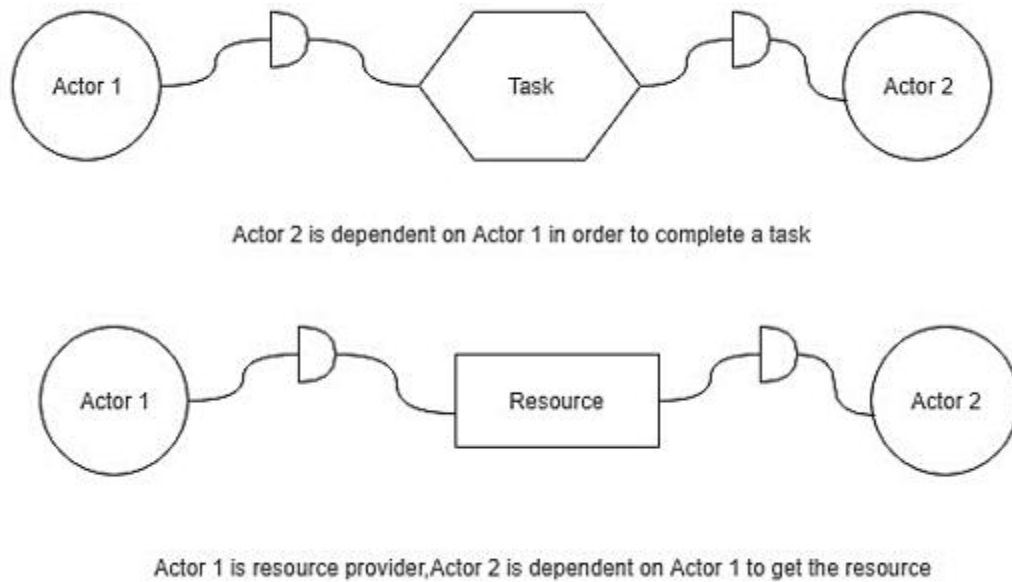


Figure 3 – Example of Notation

## 2.4.1 System goal modeling

GOAL SHELL

GOAL ID	Unique identification code of goal
GOAL NAME	Name of goal
GOAL DESCRIPTION	Description of goal
TRACEABILITY ATTRIBUTE	Traceability relation to other artefacts

Goal ID	Goal Name	Goal Description	Traceability attribute
G1	Book a room	Booking a room is higher level goal and main purpose of the system. It is broken down to lower level goals.	<a href="#">System Functions</a>
G01	Check availability	Customer checks availability of rooms by dates, number of guests and price	<a href="#">SYSF1</a>
G02	Sort rooms by price	Once available rooms are displayed customer has option to sort them by price	
G03	Select a room	Customer selects desired room in order to proceed with booking	<a href="#">SYSF2</a>

G04	Enter customer details	Customer enters their personal details necessary for booking	<a href="#">SYSE3</a>
G05	Enter payment details	Customer provides card details to confirm booking. Actual payment at this stage is not required.	
G06	Confirmation	Customer confirms booking of the selected room	<a href="#">SYSE5</a>
G08	Add new room Information	Hotel manager adds new information, photos and/or details about rooms	
G09	Check reports	Hotel manager can see predefined report	
G10	See latest bookings	Hotel manager checks latest bookings by customers	
G11	Provide reports	System provides reports for hotel manager	
G12	Send confirmation mail	System sends confirmation email to customer once booking is done	
G13	Contact by phone/face to face	Customers can contact hotel manager by phone or face to face to book a room	
G14	Confirmation of reservation	Hotel manager can confirm customers that the room is booked	
G15	Payment	Hotel manager collects payment from customer at the hotel	
G16	Update Information	Hotel manager manually updates information about customers before ORRS started running	
G17	Check availability by date	System checks available rooms according to entered dates	
G18	Check availability by room type	System checks available rooms according to entered room type	
G19	Check availability by price	System checks available rooms according to prices	
G20	Enter Date by inbuilt calendar	System pops up inbuilt calendar to enable customer enter date	
G21	Change price range	Customer can change price range when looking for rooms	

Table 4 – ORRS system Goals

## 2.4.2 Actors dependencies in a traditional approach

**Customer:** A person who is interested to book a room

**Hotel Manager:** A person who will accept room reservations from customer

**MS Excel:** Master excel sheet with room details and booking information .

“Figure 4 – ORRS Actor dependency model” represents traditional way of booking room in a hotel. Customer should call hotel manager or go to the hotel for booking a room. Payment for room bookings is paid to hotel manager. Main database is MS Excel where hotel manager can retrieve and update room and customer information from MS Excel.

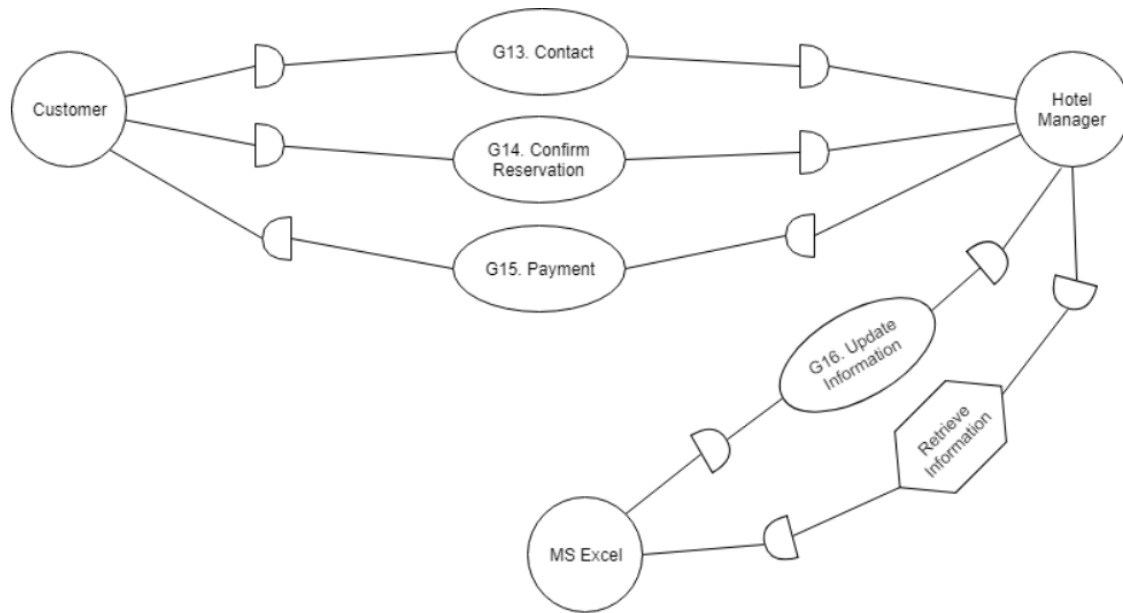


Figure 4 – ORRS Actor dependency model

### 2.4.3 Actors dependencies in the software intensive system

**Customer:** A person who is interested to book a room

**Hotel Manager:** A person who will accept room reservations from customer

**Web Interface:** User Interface webpage for ORRS

**Database:** Storage for all room details, customer information etc.

As per “Figure 5 – ORRS technical actor dependency model”, the customer depends on the ORRS to book a room as an end goal (G01.). Before that the customer has to see the available rooms (G02.) and select on; enter the customer’s details (G04.); to confirm the details and the room is booked (G06.).

On the other hand, the hotel manager depends on the system to provide the customer’s data, data on available rooms, and other sorts of data (G09.). However, the systems require input of data in case if a customer would like to reserve a room via email/phone call/in person.

In a meantime, the ORRS itself exchanges data between the interface with which the customer interacts and database from where the hotel manager receives the data.

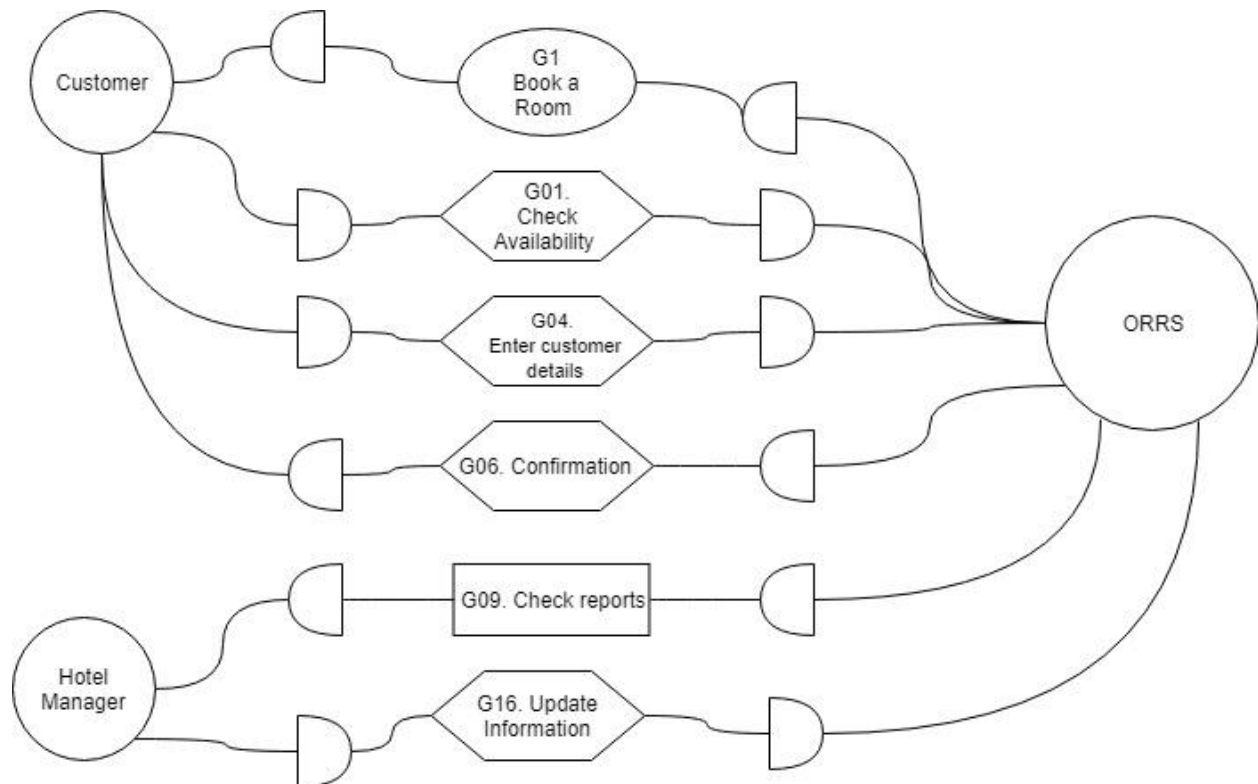


Figure 5 – ORRS technical actor dependency model

## 2.5 Goal Modelling

The Goal and Agent model shown below “Figure 6 – ORRS System KAOS Goal Model” assigns roles to agents for satisfying goals in the system. The agent(customer) books a room through the web by checking the availability of different rooms. This is done by selecting a date and room type. The date is selected by using the inbuilt calendar function of the system.

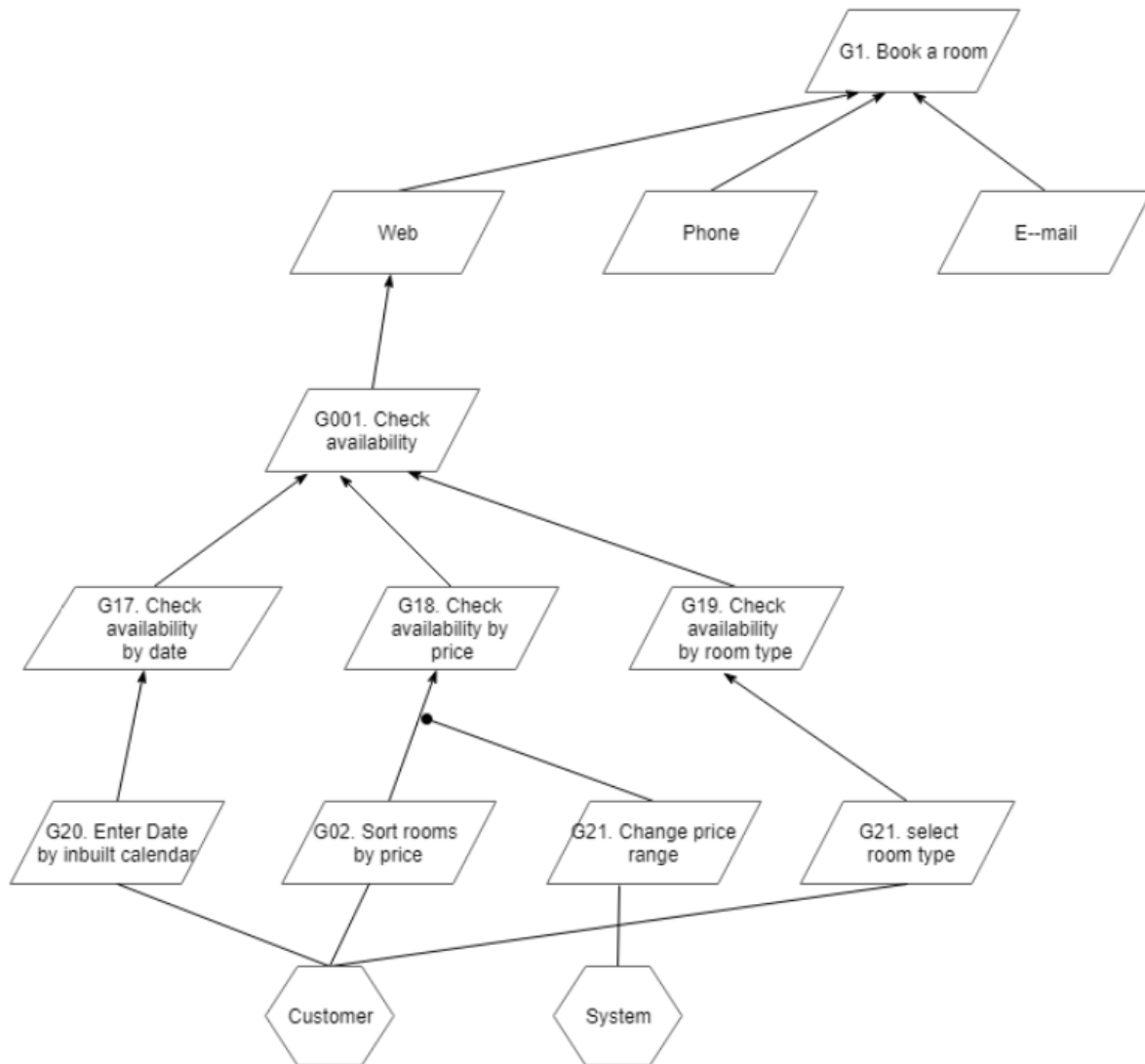


Figure 6 – ORRS System KAOS Goal Model

## **2.6 Operating Environment**

Operating environment for this system will be hosted virtually using any cloud service provider.

## **2.7 Design and Implementation Constraints**

1. The system has dependency on the database and the hotel's existing traditional system.
2. Internet connection is a constraint for this system because system is available from cloud therefore customer needs to have good network connection to connect to our web interface

## **2.8 Assumptions and Dependencies**

1. The requirements for the user interface is developed under the assumption that user interface is a subsystem of existing larger system for hotel reservation management, which keeps and processes information about existing, booked and free rooms at the hotel, including the data about room type, number of total rooms at hotel, time of check outs and other factors that influence the room availability at any given time.
2. The process and algorithm for calculating available rooms are assumed to be given prior.

## **3. System Functional Requirements**

This section illustrates the functional requirements for ORRS web interface which is having 5 different web pages that enables customer to select and reserve room online. Each web page is supported by set of specific requirements given in below tables.

The requirements below are developed within the scope from customer perspective only.

### 3.1 Checking Availability Page

#### REQUIREMENT SHELL

VER.	Version of requirement
REQ ID	Unique identification code of requirement
DESCRIPTION	Description of requirement
PRIORITIZATION ATTRIBUTE	Prioritization of requirement according to prioritization plot
TRACEABILITY ATTRIBUTE	Traceability relation to other artefacts

Requirement Shell in the table:

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	R1.1	This page shall have a field for arrival and departure dates selection	High	
V1	R1.2	This page shall have an option for selecting room type	High	Content of R1.3
V1	R1.3*	This page shall have an option for selecting number of rooms	High	Precondition to R1.2
V1	R1.4*	This page shall have an option for selecting number of adults	High	
V1	R1.5	This page shall have an option for selecting number of children	High	
V1	R1.6	Page shall show check availability and rates button to redirect customer to select a room page	High	Precondition to the requirements from SYSF2

Table 5 – Checking Availability Page

Note: \* denotes mandatory field

### 3.2 Selection of a Room Page

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	R2.1	Check the availability of rooms	High	Precondition to R2.2



V1	R2.2	Page shall display available rooms according to R2.1	High	Evolution of R2.1
V1	R2.2.1	Page shall display room pictures of all types of available rooms	Medium	Content R2.2
V1	R2.2.2	Page shall display room prices per night of all available rooms	High	Content of R2.2
V1	R2.2.3*	Page shall display select & continue button which will redirect the customer to customer details page	High	Precondition to requirements to SYSF3
V1	R2.3	Page shall have sorting function to sort by price	High	
V1	R2.4	Price shall be displayed in Euros	High	Miscellaneous of R2.2.2
V1	R2.5	Page shall display button to previous page with previous page name on the button	High	
V1	R2.6	Page shall display cancel button which will redirect the customer to hotel home page	High	

Table 6 – Selection of Room Page

### 3.3 Customer Details Page

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	R3.1*	Page shall display text field for Firstname	High	
V1	R3.2*	Page shall display text field for Lastname	High	
V1	R3.3*	Page shall display field for Telephone number	Medium	
V1	R3.4*	Page shall display field for E-mail address	High	
V1	R3.5*	Page shall display mandatory checkbox field for agreement of terms and conditions	High	
V1	R3.6	Page shall display submit details button which will redirect to payment page	High	Precondition to requirements of SYSF4
V1	R3.7	Page shall display button to previous page with previous page name on the button	High	
V1	R3.8	Page shall display cancel button which will redirect the customer to hotel home page	High	

Table 7 – Customer Details Page

### 3.4 Payment Page

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	R4.1	Page shall display Total price of selected room for selected number of nights	High	Evolution of R2.2.2 and R1.1
V1	R4.2	Page shall display field for Credit card number	High	
V1	R4.4	Page shall display field for expiration date of credit card	High	
V1	R4.5*	Page shall display mandatory checkbox field for agreement of terms and conditions	High	
V1	R4.6	Page shall display a Note: Card details will be used for authentication purposes only and the payment will charged upon customer check-in	High	Miscellaneous of R4.7
V1	R4.7	Page shall display continue button which will redirect to confirmation page	High	Precondition to requirements of SYSF5
V1	R4.8	Page shall display button to previous page with previous page name on the button	High	
V1	R4.9	Page shall display cancel button which will redirect the customer to hotel home page	High	

Table 8 – Payment Details Page

### 3.5 Confirmation page

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	R5.1	Page shall display previous inputs by customer as <a href="#">SYSF3R3.1-SYSF3R3.4</a>	High	Evolution of <a href="#">SYSF3R3.1-SYSF3R3.4</a>
V1	R5.2	Page shall display arrival and departure dates according to customer selection in <a href="#">SYSF1R1.1</a>	High	Evolution of <a href="#">SYSF1R1.1</a>
V1	R5.3	Page shall display room selection details chosen by customer according <a href="#">SYSFR2.2.3</a>	High	Evolution of <a href="#">SYSFR2.2.3</a>
V1	R5.4	Page shall display total price according to <a href="#">SYSF4R4.1</a>	High	Evolution of <a href="#">SYSF4R4.1</a>

V1	R5.5	Page shall display customer payment details entered by customer according to <a href="#">SYSF4R4.2-SYSF4R4.4</a>	High	Evolution of <a href="#">SYSF4R4.2-SYSF4R4.4</a>
V1	R5.6	Page shall display confirm button which will redirect to Home page	High	
V1	R5.6.1	Page shall display a pop-up with a message: Thank you for your booking		
V1	R5.7	When customer clicks confirm button, All details from confirmation page will be stored in the hotel's common database.	High	
V1	R5.8	Upon clicking confirmation button, an email will be sent out with all details according <a href="#">SYSF5R5.1 – SYSF5R5.4</a>	High	Evolution of <a href="#">SYSF5R5.1 – SYSF5R5.4</a>
V1	R5.8.1	Email shall be sent out to customer's email address according to SYSF3R3.4		Evolution SYSF3R3.4
V1	R5.9	Page shall display button to previous page with previous page name on the button	High	
V1	R5.10	Page shall display cancel button which will redirect the customer to hotel home page	High	
VI	R5.11	Upon Confirmation “Thank you for your booking” message shall be displayed	Medium	

Table 9 – Confirmation Page

#### 4. Other Nonfunctional Requirements

This section illustrates the non-functional requirements which includes performance, reliability, security, maintainability, portability requirements, use cases, use-case scenarios, solution-oriented requirements modelling, software quality attributes for ORRS web interface.

##### REQUIREMENT SHELL

VER.	Version of requirement
REQ ID	Unique identification code of requirement
DESCRIPTION	Description of requirement
PRIORITIZATION ATTRIBUTE	Prioritization of requirement according to prioritization plot
TRACEABILITY ATTRIBUTE	Traceability relation to other artefacts

#### 4.1 Performance Requirements

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	PFR1	Every booking submission & modification should be updated in Hotel's common database within 10 seconds after each submission & modification activity	High	Constraints to R5.7
V1	PFR2	Results for cross checking of availability of rooms in internal database and customer's choice shall be in 5 seconds	High	Constraints to R2.1
V1	PFR3	Webpage UI load time should be within 2 secs	High	Constraints to R1.6, R2.2.3, R2.5, R2.6, R3.6, R3.7, R3.8, R4.7, R4.8, R4.9, R5.9, R5.10, R5.6
V1	PFR4	Redirection page load time shall be within 2 secs	High	Constraints to R1.6, R2.2.3, R2.5, R2.6, R3.6, R3.7, R3.8, R4.7, R4.8, R4.9, R5.9, R5.10, R5.6
V1	PFR5	Confirmation email shall be sent into customer's mentioned email within 2 secs after confirmation page termination	Low	Constraint to R5.8.1

Table 10 – Performance Requirements

#### 4.2 Reliability Requirements

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	RR1	Database should be synchronized to cloud every 5 minutes	High	
V3	RR2	System shall be accessible 98% of the time	High	

Table 11 – Reliability Requirements

#### 4.3 Security Requirements

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
------	--------	-------------	--------------------------	------------------------

V1	SR1	Customer's personal details shall be encrypted	High	Miscellaneous
V1	SR2	Customer's credit card details shall be deleted from database after checkout date	High	Miscellaneous

Table 12 – Security Requirements

#### 4.4 Maintainability Requirements

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V3	MTR1	No method in any object may exceed 100 lines of code	High	
V1	MTR2	System failure recovery shall be within 40 mins	High	

Table 13 – Maintainability Requirements

#### 4.5 Portability requirements

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V3	PTR1	System shall be accessible on mobile devices	High	Miscellaneous
V3	PTR2	System shall be accessible on Google Chrome, Firefox, Safari, Opera and Internet explorer	High	Miscellaneous

Table 14 – Portability Requirements

#### 4.6 Use cases

“Figure 7 – ORRS Use Case Diagram” identifies main actors. In the diagram there are two actors, though the document will only develop specific requirements from the customers' perspective.

On the figure 6 system's main functions are depicted and along with the ID. Customer will predominantly be using the following functions 1-4, while hotel manager's main functions will be the rest (5,6).

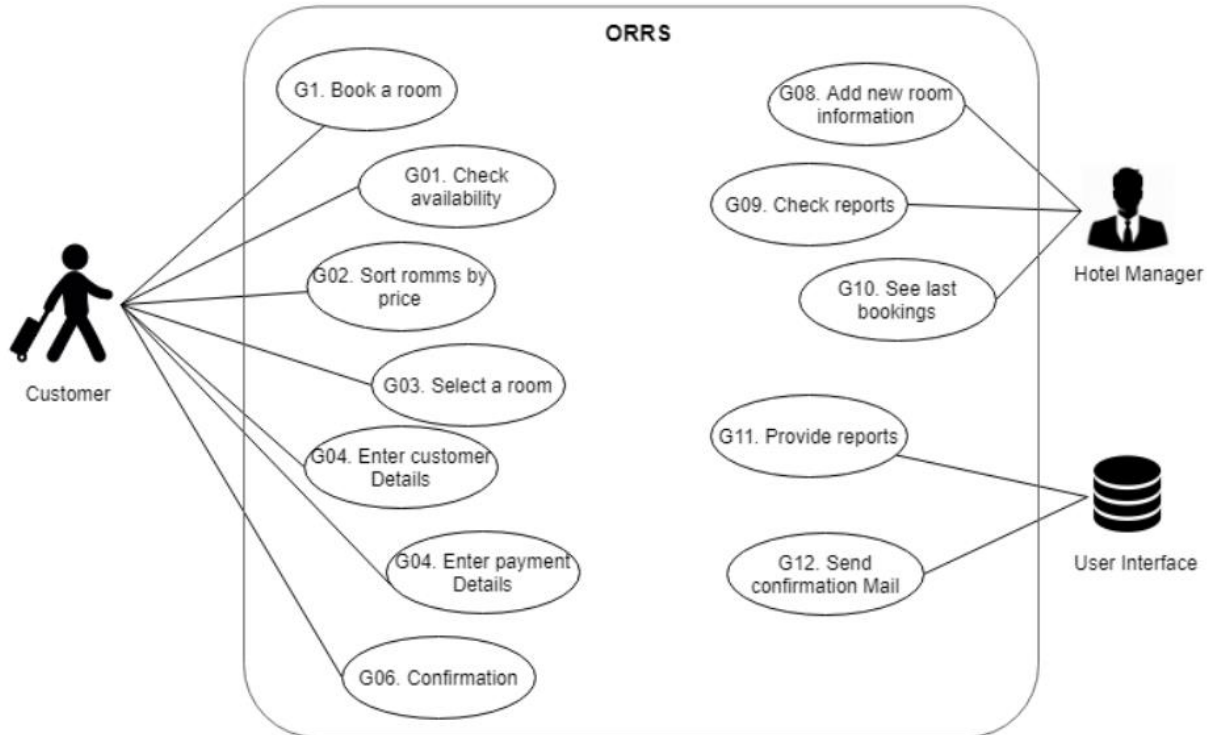


Figure 7 – ORRS Use Case Diagram

#### 4.7 Use case Scenarios

General:

Use Case ID:	ORRS - 1		
Use Case Name:	Hotel Room Booking		
Created By:	N Kothamasu	Last Updated By:	N Kothamasu
Date Created:	10.11.2018	Date Last Updated:	10.11.2018

Actors:	Customer, Hotel Manager
Description:	Customer accesses the web interface of ORRS and checks the availability of rooms available for him to book. Then he can select the room and complete all requested details to complete the booking
Trigger:	Customer accessing web interface
Preconditions:	NA
Postconditions:	Customer completes booking for the room

## ***Software Requirements Specification for Online Room Reservation System***

Normal Flow:	Customer selects the check-in and check-out date, room type, number of adults, number of children from the web interface of ORRS and click next button System displays available rooms available for the customer chosen dates Customer can sort using sort option using highest & lowest Customer selects the room and click next button System displays a page to enter customer details Customer enters all requested details and click next button System displays payment details authentication page Customer enters credit card details for authentication purpose and click submit button System stores details and send a confirmation email to customers with customer entered details and check-in/check-out information
Alternative Flow:	
Exceptions:	Customer could enter some wrong details because of typo errors
Includes:	NA
Priority:	All mandatory requirements
Frequency of Use:	Depending on Customer interaction
Business Rules:	
Special Requirements:	
Assumptions:	
Notes and Issues:	

Table 15 – Hotel Room Booking

Use Case ID:	ORRS - 2		
Use Case Name:	Checking Availability		
Created By:	Roza Mikeliani	Last Updated By:	Roza Mikeliani
Date Created:	10.11.2018	Date Last Updated:	10.11.2018

Actors:	Customer
Description:	Customer accesses the web interface of ORRS; Enters the preferred dates of stay in the inbuilt calendar with date format dd/mm/yyyy based this dates website displays available rooms, with prices and other details.
Trigger:	Customer entering dates in inbuilt calendar
Preconditions:	NA
Postconditions:	Customers presses button to proceed with the next page

## ***Software Requirements Specification for Online Room Reservation System***

Normal Flow:	Customer enters arrival and departure dates based on which system displays available rooms along with the prices.
Alternative Flow:	If customer doesn't enter any date, system by default takes "today" and "tomorrow" for arrival and departure dates, and base on these dates displays available rooms along with the prices.
Exceptions:	NA
Includes:	NA
Priority:	Mandatory
Frequency of Use:	Depending on Customer interaction
Business Rules:	Customer cannot book room without proceeding this page
Special Requirements:	NA
Assumptions:	Customer uses inbuilt calendar to enter dates
Notes and Issues:	

Table 16 – Checking Availability

Use Case ID:	ORRS – 3		
Use Case Name:	Payment		
Created By:	Nikolay Roll	Last Updated By:	Nikolay Roll
Date Created:	10.11.2018	Date Last Updated:	10.11.2018

Actors:	Customer, ORRS
Description:	Customer shall be able to enter payment details for authentication & room booking confirmation purposes
Trigger:	Customer is redirected to the "Payment page" after clicking "Submit details" button on the page "Customer details"
Preconditions:	Customer has selected a room/rooms and entered details
Postconditions:	Customers presses button to proceed with the next page
Normal Flow:	Customer sees the displayed Total price of the room he/she is going to reserve. Customer enters the card data into the system which includes: <ul style="list-style-type: none"><li>- select card type (Visa, Mastercard, other)</li><li>- enter card number (16 numbers);</li><li>- enter expiration date (month and year)</li></ul> Customer agrees with terms and conditions by reading them and clicking a checkbox.



## ***Software Requirements Specification for Online Room Reservation System***

	Customer reads a Note (Card details will be used for authentication purposes only and the payment will be charged upon customer check-in) if he/she wants to reassure why the card data is requested. Customer clicks “Continue” button to proceed to confirmation page
Alternative Flow:	Customer checks entered information and notices information is not correct. Customer clicks previous page button to correct information that is wrong.
Exceptions:	NA
Includes:	NA
Priority:	Mandatory
Frequency of Use:	Depending on customer interaction
Business Rules:	Customer cannot book room without proceeding this page
Special Requirements:	NA
Assumptions:	Customer uses dropdown menus to enter dates
Notes and Issues:	

Table 17 – Payment

Use Case ID:	ORRS - 4		
Use Case Name:	Confirmation		
Created By:	Lars Bosgraaf	Last Updated By:	Lars Bosgraaf
Date Created:	10.11.2018	Date Last Updated:	10.11.2018

Actors:	Customer, ORRS
Description:	Customer shall be able to view all entered details on confirmation page and confirm details with confirm button
Trigger:	Customer is redirected to the “Confirmation page” after clicking “Continue” button on the “Payment page”
Preconditions:	Customer has selected a room/rooms, entered details, entered payment information, and agreed with terms and conditions
Postconditions:	Customer presses confirm button to return to website homepage
Normal Flow:	Customer sees information displayed, entered by customer on check availability page, room selection page, customer details page and payment page. Customer checks entered information and confirms if information is correct. Customer clicks confirm button. Customer is redirected to homepage.

## ***Software Requirements Specification for Online Room Reservation System***

	System sends confirmation e-mail with information displayed on confirmation page to customer.
Alternative Flow:	Customer checks entered information and notices information is not correct. Customer clicks previous page button to correct information that is wrong.
Exceptions:	NA
Includes:	NA
Priority:	Mandatory
Frequency of Use:	Depending on customer interaction
Business Rules:	Customer cannot book room without proceeding this page
Special Requirements:	NA
Assumptions:	Customer enters information on check availability page, room selection page, customer details page and payment page.
Notes and Issues:	

Table 18 – Confirmation

Use Case ID:	ORRS - 5		
Use Case Name:	Customer details		
Created By:	Zaur Ayrarov	Last Updated By:	Zaur Ayrarov
Date Created:	10.11.2018	Date Last Updated:	10.11.2018

Actors:	Customer
Description:	Customer should complete all requested details to complete the booking
Trigger:	Customer selecting room
Preconditions:	NA
Postconditions:	Customer completes booking for the room
Normal Flow:	Customer enter firstname, lastname, telephone number, email address and click submit button System displays payment page
Alternative Flow:	If customer does not fill mandatory fields, system notify customer
Exceptions:	Customer could enter some wrong details because of typo errors

## ***Software Requirements Specification for Online Room Reservation System***

	Customer could enter wrong format of email address and telephone number
Includes:	NA
Priority:	All mandatory fields
Frequency of Use:	Depending on Customer interaction
Business Rules:	Customer cannot book without proceeding this page
Special Requirements:	NA
Assumptions:	
Notes and Issues:	

Table 19 – Customer Details

Use Case ID:	ORRS - 6		
Use Case Name:	Room selection		
Created By:	Fortune Festus	Last Updated By:	Fortune Festus
Date Created:	11.11.2018	Date Last Updated:	11.11.2018

Actors:	Customer.
Description:	Customer shall be able to select room type by clicking single or double and sort room by price and date.
Trigger:	Customer is re-directed to the “select room page” after clicking the “check availability and rates” button.
Preconditions:	Customer has entered arrival and departure date. Customer has selected room type. Customer has clicked check availability button.
Postconditions:	Customer selects a room
Normal Flow:	Page displays pictures of all available room. Page displays prices per night in Euros. Customer selects room Page displays continue and select button which re-directs customer to customer details page. Page displays previous page button Page displays cancel button which directs the customer to home page.
Alternative Flow:	Page shall display error message if customer omits to select a room.
Exceptions:	Customer could enter wrong details.
Includes:	NA

Priority:	All mandatory requirements
Frequency of Use:	Depending on Customer interaction
Business Rules:	NA
Special Requirements:	
Assumptions:	NA
Notes and Issues:	

Table 20 – Room Selection

## 4.8 Solution Oriented Requirements Modelling

### 4.8.1 Class Diagram of the Process for Booking a Room

During modelling solution oriented requirements, the scope of the system has been narrowed down to the customer and web-interface interaction during the process of booking a room.

“Figure 8 – ORRS Class Diagram of Booking a Room” describes the classes, subclasses and associations between them. As well as object attributes and their main functions.

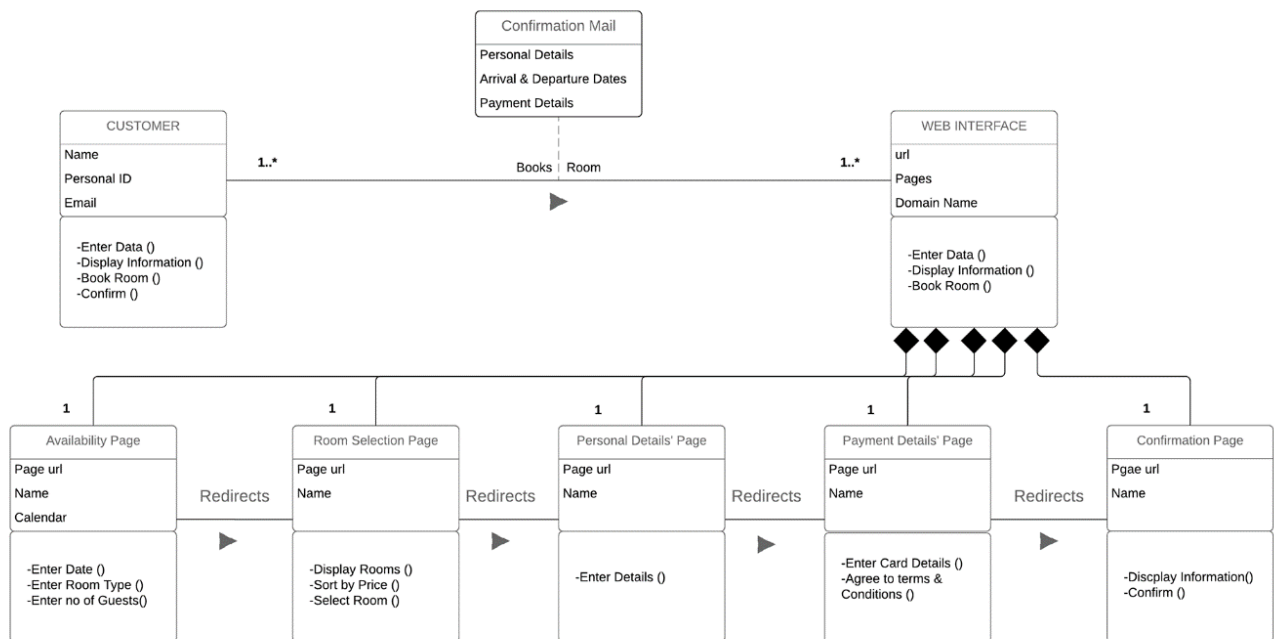


Figure 8 – ORRS Class Diagram of Booking a Room

## 4.8.2 State Diagram for Objects of Booking a Room

State models describe how system objects and operations transit from one state to another. States of the system objects have been derived from the class diagram for booking a room and have been traced to specific requirements.

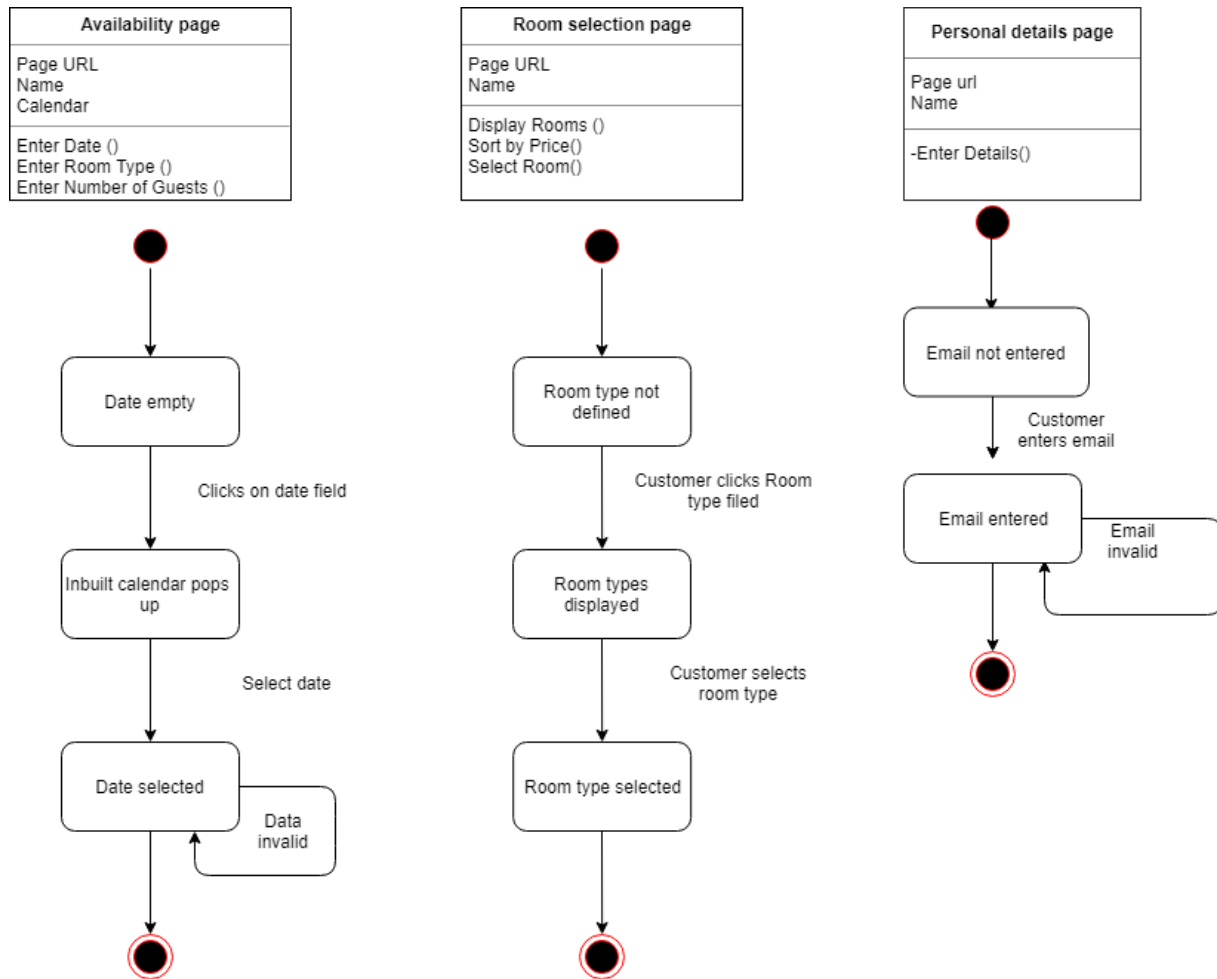


Figure 9 – State Diagrams of Objects from class diagram of booking a room part 1

“Figure 9 – State Diagrams of Objects from class diagram of booking a room” describes states for the all 5 main pages (objects of “Figure 8 – ORRS Class Diagram of Booking a Room”).

Availability Page has two major functions choosing a date and a room type according to which availability is checked.

For first attribute of this object (Date) is empty, until customer clicks on date field which pops up inbuilt calendar, where customer selects preferred date. The last state is in loop until customer selects a date. Once date is selected state diagram reaches its end.

Room Selection Page starts with the state when room type is not defined. Customer clicks on the field and room types are displayed within a drop-down menu. Once customer chooses room type, “room type selected state” will be reached and that is the final state of this object.

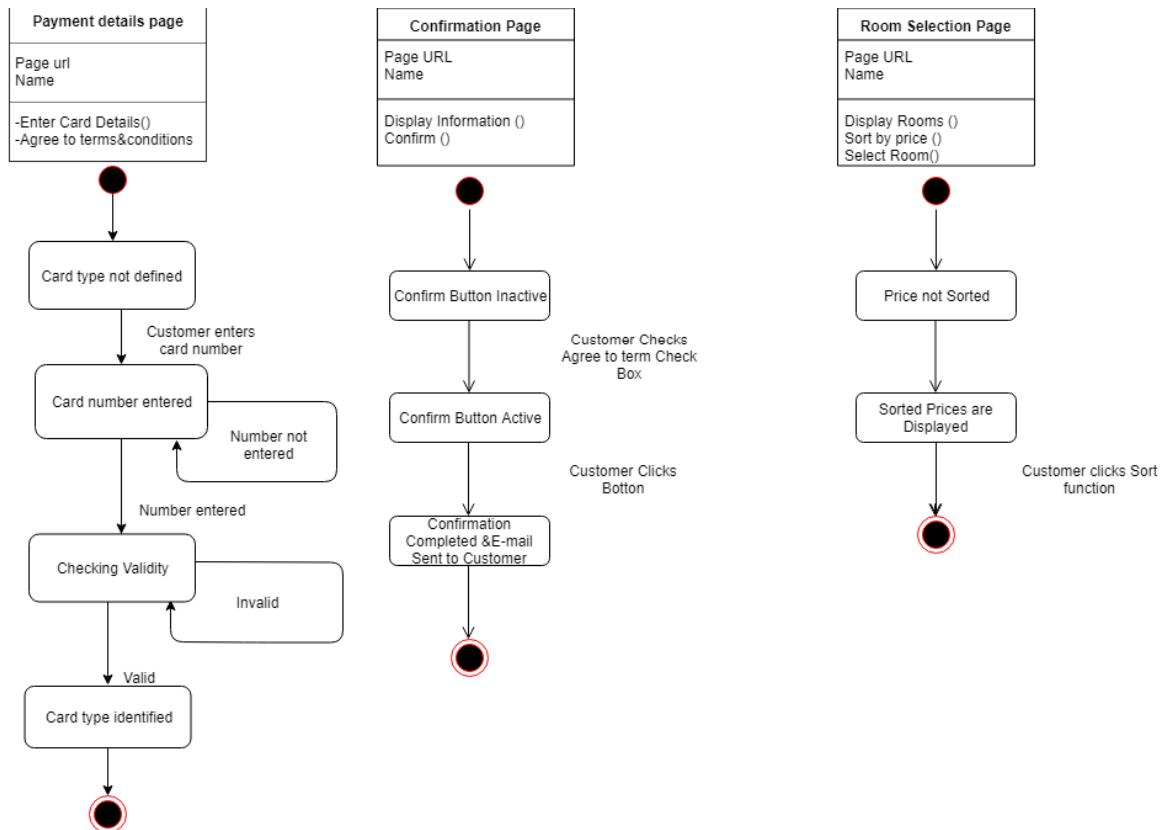


Figure 10 - State Diagrams of Objects from class diagram of booking a room part 2

### 4.8.3 Process of Booking a Room

“Figure 11 – Process of Booking a Room” describes the sequential interaction between the customer and the system. After every webpage in the web-interface, the system has to redirect the customer to the next page of the web-interface. The customer and system constantly go back and forward in the process.

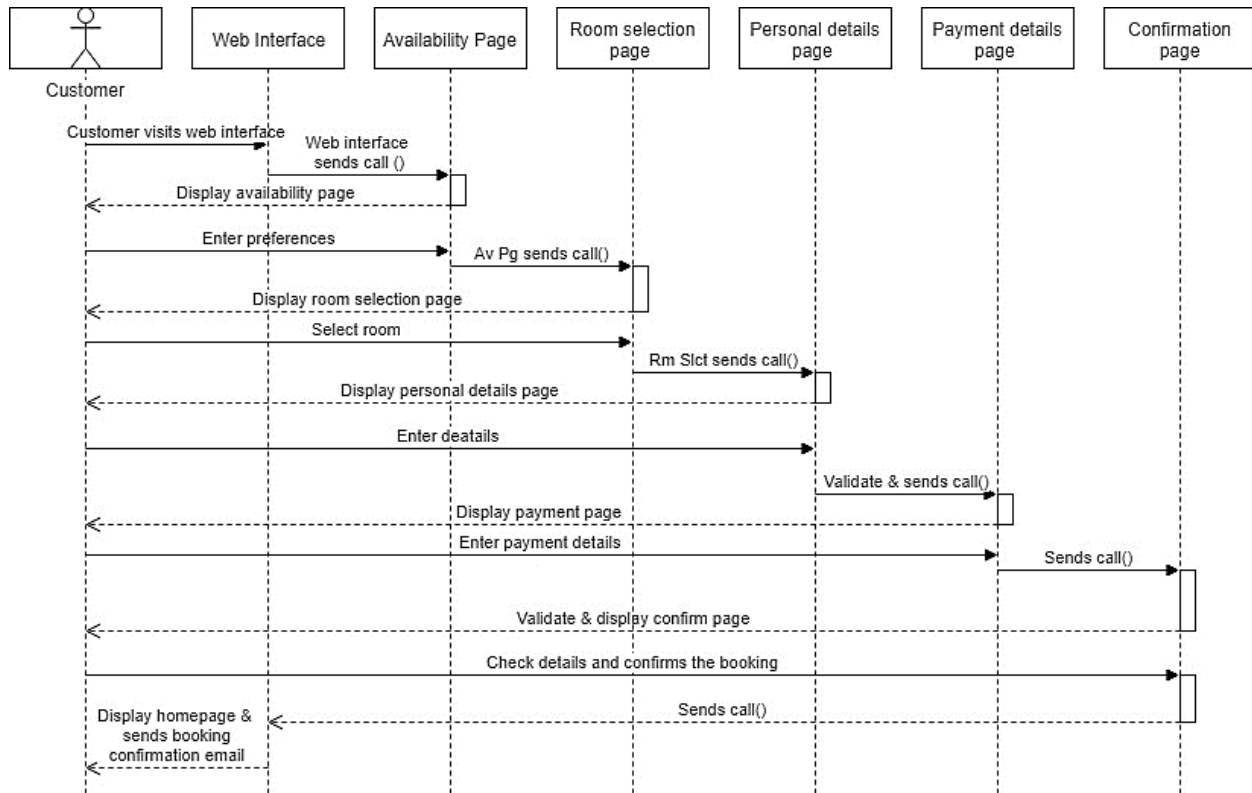


Figure 11 – Process of Booking a Room

## 4.9 Solution oriented requirements

During the modelling of ORRS system, new requirements have been elicited. These requirements are shown in the table below.

### REQUIREMENT SHELL

VER.	Version of requirement
REQ ID	Unique identification code of requirement
DESCRIPTION	Description of requirement
PRIORITIZATION ATTRIBUTE	Prioritization of requirement according to prioritization plot
TRACEABILITY ATTRIBUTE	Traceability relation to other artefacts

Ver.	Req ID	Description	Traceability Attribute
V4	SOR1.1	Web interface checks if checkbox is selected for accepting terms & conditions	R5.8
V4	SOR1.2	Web interface shall check customer entered card details or not	R4.2
V4	SOR1.3	Web interface shall check email if is entered or not	R3.4
V4	SOR1.4	Web interface shall not accept arrival date later than departure date.	R1.1
V4	SOR1.5	Web interface shall not accept total number of guests higher than 50	R1.4, R1.5
V4	SOR1.6	Web interface shall not accept e-mail address if e-mail address does not have one “@” character and at least one “.” character in e-mail address.	R3.4
V4	SOR1.7	Web interface shall verify credit card type from credit card number entered by customer	R4.2
V4	SOR1.8	Web interface shall not accept special characters in name fields	R3.1, R3.2
V4	SOR1.9	Web interface shall not accept numbers in name fields	R3.1, R3.2
V4	SOR1.10	Web interface shall check if all fields are filled	R3.1, R3.2, R3.3, R3.4
V4	SOR1.11	Web interface shall not accept expiration date of credit card that is prior to current date	R4.4
V4	SOR1.12	Web interface shall have select button next to available rooms	R2.2

#### **4.10 Software Quality Attributes**

##### **Software Quality Attributes:**

- **Flexibility:** System should be built flexible enough to add new features and integrate with external system API’s from booking.com or expedia.com in future.
- **Integrity:** System should secure customer’s details to avoid data losses and data manipulation
- **Usability:** System should be able to easily accessible by all users



- **Maintainability:** System shall be able to maintain easily at any point of time in future
- **Testability:** System shall be able to test and confirm all the specifications according to client's requirements.

## 5. Business Rules

- Room Type: Single Room; Double Room.  
1 single room can accommodate either 1 adult or 1 child. 1 double room can accommodate 2 adults, 2 children or 1 adult and 1 child.
- GDPR implies deleting Customer's Credit card information within 24 hrs. after checkout.

## 6. Other Requirements

### REQUIREMENT SHELL

VER.	Version of requirement
REQ ID	Unique identification code of requirement
DESCRIPTION	Description of requirement
PRIORITIZATION ATTRIBUTE	Prioritization of requirement according to prioritization plot
TRACEABILITY ATTRIBUTE	Traceability relation to other artefacts

Ver.	Req ID	Description	Prioritization Attribute	Traceability Attribute
V1	OFR1	Customer shall be notified by email after checkout with a message: "Thank you for your stay , Hope we will see you back again and receive 10% discount"	Low	
V1	OFR2	System shall be able to translate into customer's choice of language using inbuilt google translator API	Medium	

Table 21 – Other Requirements

## 7. Prototype of Web-Interface for Booking a Room

For the functions introduced in [Table 3 – System Functions](#) prototype of web-interface pages have been developed.

**Page 1:** Traced back to [Checking Availability Page](#)

The screenshot shows a hotel room with a large bed and a wall mural. Overlaid on the right is a booking form titled "Fortune Suites". The form contains the following fields:

- Arrival Date: 4/22/2019 (with a calendar icon)
- Departure Date: 4/23/2019 (with a calendar icon)
- Room Type: Single (with a dropdown arrow)
- Number of Rooms: 1 (with a dropdown arrow)
- Number of Adults: 1 (with a dropdown arrow)
- Number of Children: 1 (with a dropdown arrow)
- Check Availability button

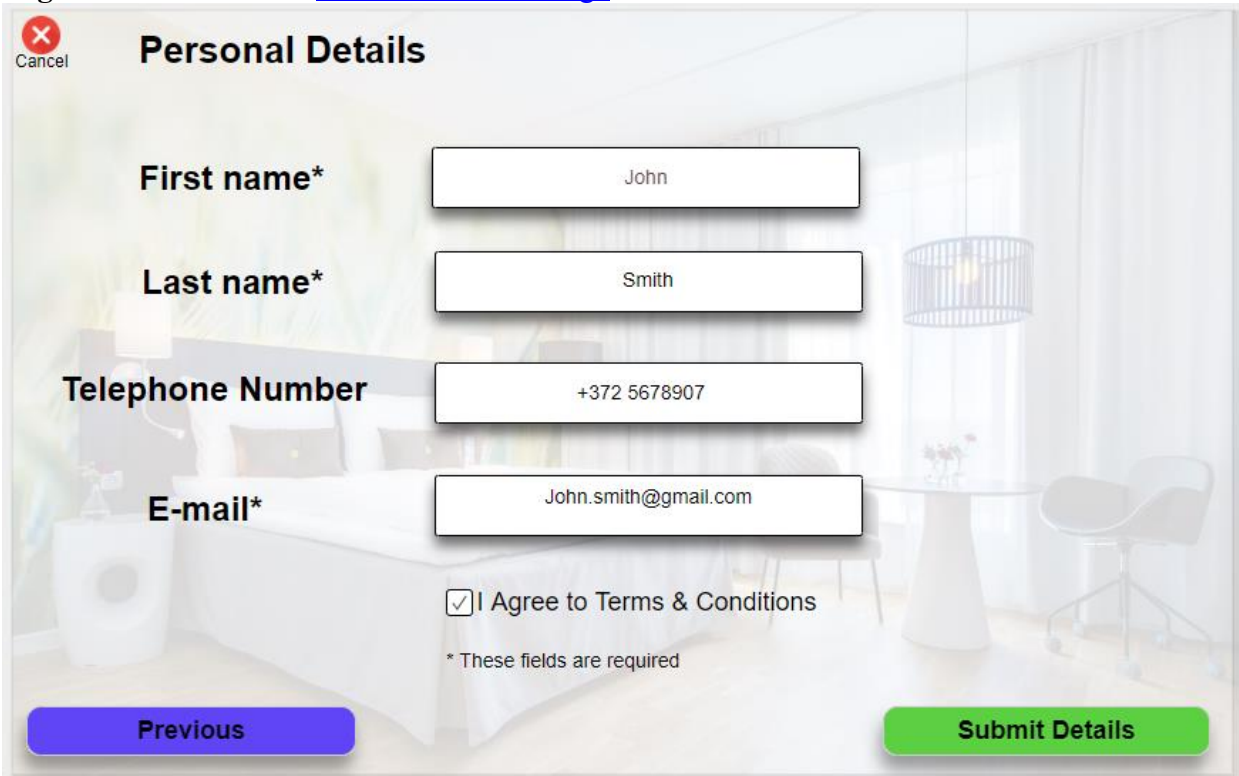
**Page 2:** Traced back to [Selection of a Room Page](#)

The screenshot shows a room selection interface. At the top left is a "Cancel" button with a red X icon. The interface lists three room types with their respective images, descriptions, and prices:

Room Type	Number of rooms	Price
 Standard Single Room <a href="#">Description</a>	1	65 EUR/Night
 Standard Double Room <a href="#">Description</a>	0	70 EUR/Night
 King Size Exclusive Room <a href="#">Description</a>	0	80 EUR/Night

At the bottom left is a "Previous" button, and at the bottom right is a "Select & Continue" button.

Page 3: Traced back to [Customer Details Page](#)



The form is titled "Personal Details" and is set against a background image of a modern hotel room. It includes a "Cancel" button with a red 'x' icon in the top left corner. The form contains four text input fields: "First name\*" with the value "John", "Last name\*" with the value "Smith", "Telephone Number" with the value "+372 5678907", and "E-mail\*" with the value "John.smith@gmail.com". Below these fields is a checkbox labeled "I Agree to Terms & Conditions" which is checked. A note below the checkbox states "\* These fields are required". At the bottom, there are two buttons: a blue "Previous" button on the left and a green "Submit Details" button on the right.

**Personal Details**

First name\* John

Last name\* Smith

Telephone Number +372 5678907

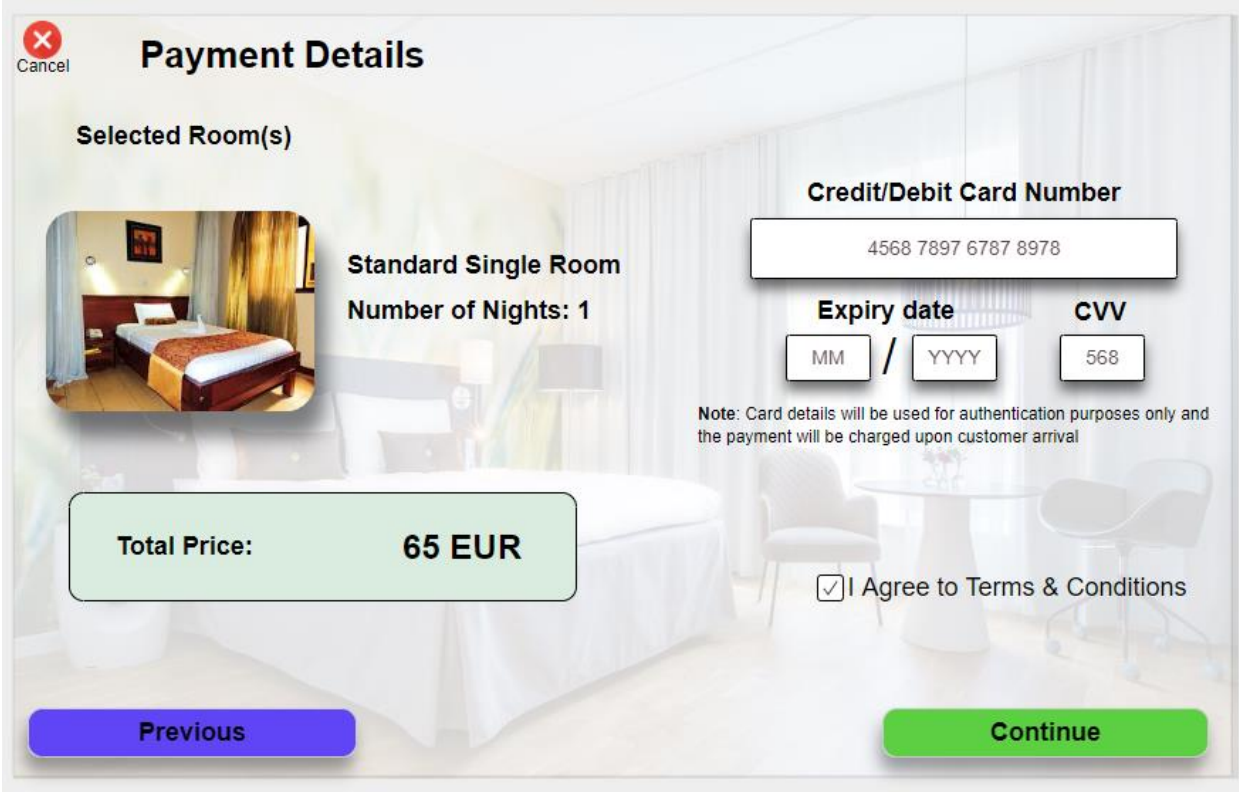
E-mail\* John.smith@gmail.com

☒ I Agree to Terms & Conditions

\* These fields are required

Previous Submit Details

Page 4: Traced back to [Payment Page](#)



The form is titled "Payment Details" and is set against a background image of a modern hotel room. It includes a "Cancel" button with a red 'x' icon in the top left corner. The form is divided into two main sections. The left section, titled "Selected Room(s)", features a small image of a "Standard Single Room" and the text "Number of Nights: 1". The right section, titled "Credit/Debit Card Number", contains a large text input field with the value "4568 7897 6787 8978", and two smaller input fields for "Expiry date" (with sub-fields "MM" and "YYYY") and "CVV" (with the value "568"). Below these fields is a note: "Note: Card details will be used for authentication purposes only and the payment will be charged upon customer arrival". At the bottom, there is a checkbox labeled "I Agree to Terms & Conditions" which is checked. A green box on the left displays "Total Price: 65 EUR". At the bottom, there are two buttons: a blue "Previous" button on the left and a green "Continue" button on the right.

**Payment Details**

Selected Room(s)

Standard Single Room

Number of Nights: 1

Credit/Debit Card Number

4568 7897 6787 8978

Expiry date

MM / YYYY

CVV

568

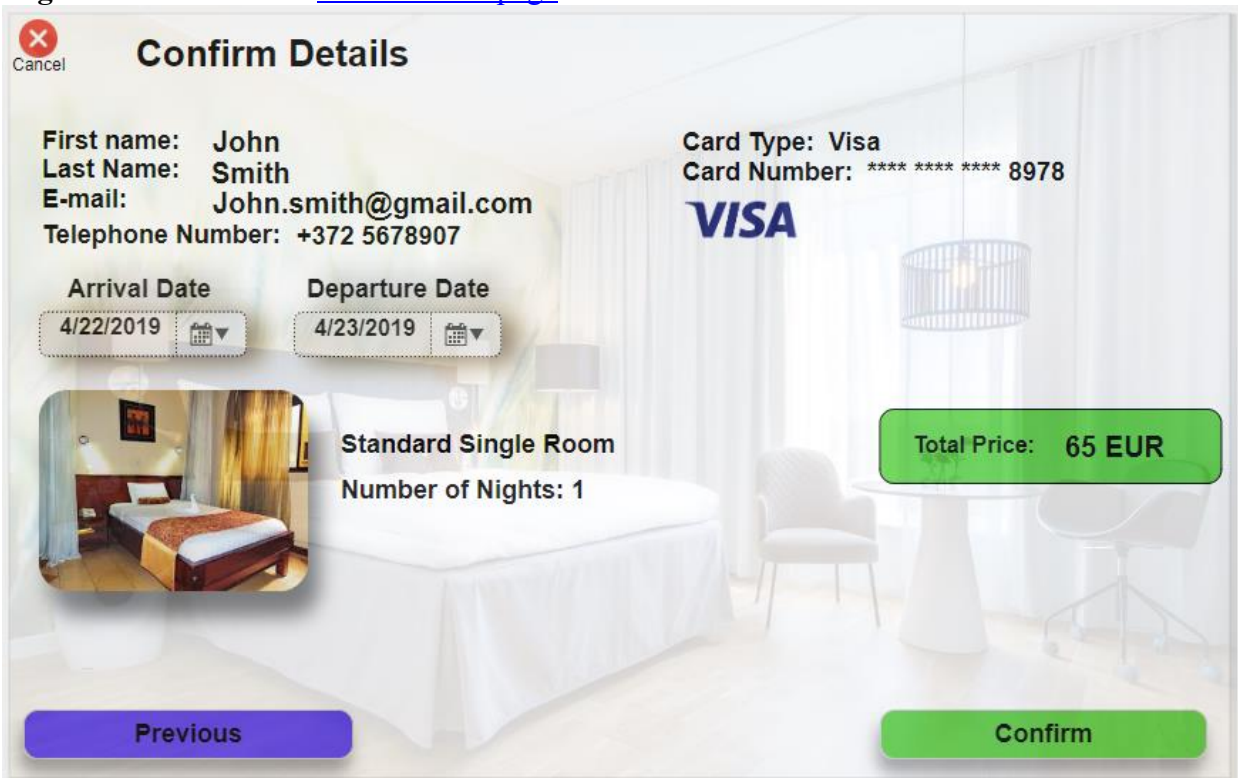
Note: Card details will be used for authentication purposes only and the payment will be charged upon customer arrival

☒ I Agree to Terms & Conditions

Total Price: 65 EUR

Previous Continue

Page 5: Traced back to [Confirmation page](#)



The image shows a 'Confirm Details' page for a room reservation. At the top left is a red 'X' icon and the word 'Cancel'. The title 'Confirm Details' is centered at the top. Below the title, the user's personal information is listed: First name: John, Last Name: Smith, E-mail: John.smith@gmail.com, and Telephone Number: +372 5678907. To the right, the card information is shown: Card Type: Visa, Card Number: \*\*\*\* \* 8978, with the VISA logo below it. Below the personal information, there are two date pickers: 'Arrival Date' set to 4/22/2019 and 'Departure Date' set to 4/23/2019. A small thumbnail image of a hotel room is shown on the left. To its right, the room type is 'Standard Single Room' and the 'Number of Nights' is '1'. A green box on the right displays the 'Total Price: 65 EUR'. At the bottom, there are two buttons: a purple 'Previous' button on the left and a green 'Confirm' button on the right. The background of the page is a large, bright image of a modern hotel room with a large bed, a desk, and a chair.

**Confirm Details**

First name: John  
Last Name: Smith  
E-mail: John.smith@gmail.com  
Telephone Number: +372 5678907

Card Type: Visa  
Card Number: \*\*\*\* \* 8978  
**VISA**

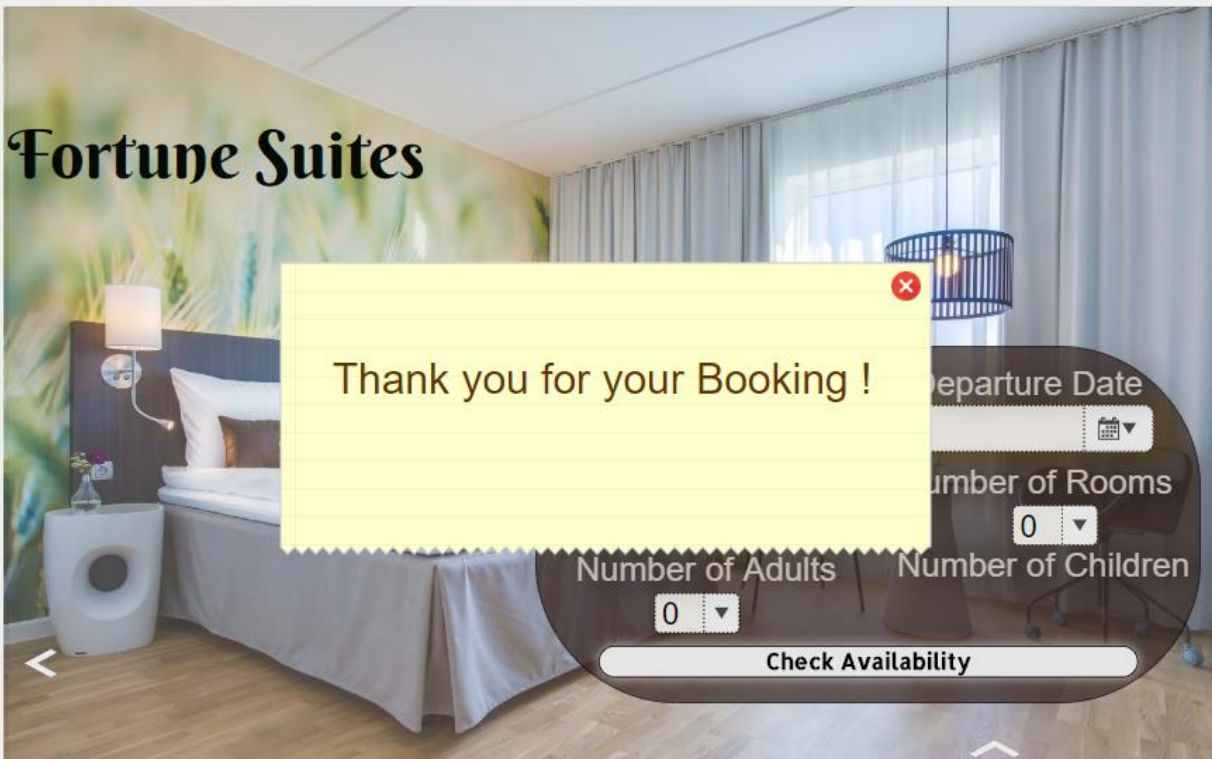
Arrival Date: 4/22/2019  
Departure Date: 4/23/2019

**Standard Single Room**  
Number of Nights: 1

Total Price: 65 EUR

Previous Confirm

Page 6: Traced back to [Confirmation page - R5.11](#)



The image shows a booking page for 'Fortune Suites'. The title 'Fortune Suites' is at the top left. A large yellow modal box with a red 'X' icon in the top right corner is centered on the page, containing the text 'Thank you for your Booking !'. Below the modal, there is a form with several fields: 'Departure Date' with a calendar icon, 'Number of Rooms' with a dropdown menu showing '0', 'Number of Adults' with a dropdown menu showing '0', and 'Number of Children' with a dropdown menu. A 'Check Availability' button is at the bottom of the form. The background of the page is a large image of a hotel room with a bed, a desk, and a chair.

**Fortune Suites**

Thank you for your Booking !

Departure Date  
Number of Rooms: 0  
Number of Adults: 0  
Number of Children

Check Availability



## 8. Traceability & Prioritization

### 8.1 Traceability Model

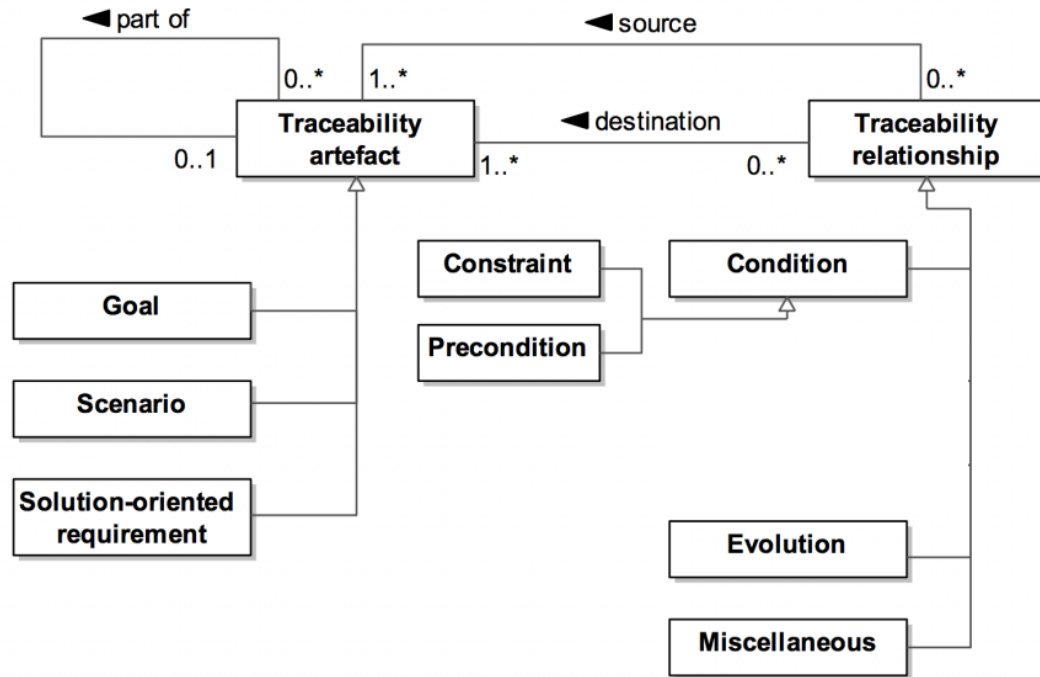


Figure 12 –Traceability Model

**Precondition** -the precondition realizing a functional requirement might be that the hardware meets a specific performance requirement

**Post condition** - Describing the state the system is in after all the events in the use case have taken place

**Evolution** - Satisfies another requirement, meaning if artefact A is realized in the system, artefact B is realized as well

**Miscellaneous** - any kind of information related to a requirements artefact.

**Constraint** - when a solution-oriented requirement can be a constraint of another solution-oriented requirement

### 8.2 Traceability Matrix

In the matrix below each requirement is traced back to the source function/goal to which it supports. Some requirements satisfy more than one goal.

*Software Requirements Specification for Online Room Reservation System*

Satisfies	SYSF1	SYSF2	SYSF3	SYSF4	SYSF5
R1.1	X				
R1.2	X				
R1.3*	X				X
R1.4*	X				X
R1.5	X				
R1.6	X				
R2.1		X			
R2.2		X			
R2.2.1		X			
R2.2.2		X			
R2.2.3*		X			X
R2.3		X			
R2.4		X			
R2.5		X			
R2.6			X		
R3.1*			X		X
R3.2*			X		X
R3.3*			X		X
R3.4*			X		X
R3.5*			X		X
R3.6			X		
R3.7			X		
R3.8			X		
R4.1				X	
R4.2				X	
R4.4				X	
R4.5*				X	X
R4.6				X	
R4.7				X	
R4.8				X	
R4.9				X	

R5.1					X
R5.2					X
R5.3					X
R5.4					X
R5.5					X
R5.6					X
R5.6.1					X
R5.7					X
R5.8					X
R5.8.1					X
R5.9					X
R5.10					X

Table 22 – Traceability Matrix

### 8.3 Prioritization

Moscow technique was used for prioritization purposes. The results are presented below:

MANDATORY	MANDATORY	SHOULD (of High Priority)	COULD (Preferred but not necessary)	WOULD (Can be postponed and suggested for future)
R1.3	R4.4	R1.1	R2.2.1	OFR1
R1.4	R4.5	R1.2	R3.3	PFR5
R1.5	R4.7	R2.3	OFR2	
R1.6	R4.8	R4.6		
R2.2	R4.9	R5.8		
R2.2.2	R5.1	PFR2		
R2.2.3	R5.2	PFR3		
R2.4	R5.3	PFR4		
R2.5	R5.4	RR1		
R2.6	R5.5	MTR2		
R3.1	R5.6			
R3.2	R5.7			
R3.4	R5.9			

R3.5	R5.10			
R3.6	PFR1			
R3.7	SR1			
R3.8	SR2			
R4.1				
R4.2				
R2.1				

Table 23 – Requirements Prioritization Matrix

## 8.4 Value Matrix

### Prioritization by value

The following figure describes the prioritization of requirements according to the value they it offers. A number and higher percentage means the requirement offers more value.

	R1.1	R1.2	R2.3	R4.6	R5.8	PFR1	PFR2	PFR3	PFR4	SFTR1	SFTR2	sum	%
R1.1	0,02	0,11	0,14	0,09	0,01	0	0,01	0,01	0,01	0,02	0,04	0,45	4%
R1.2	0	0,02	0,05	0,08	0,01	0	0,01	0,01	0,01	0,02	0,05	0,24	2%
R2.3	0	0,01	0,02	0,11	0,01	0	0,01	0,01	0,01	0,02	0,05	0,23	2%
R4.6	0	0	0	0,01	0,01	0	0,01	0,01	0,01	0,02	0,05	0,12	1%
R5.8	0,16	0,12	0,11	0,11	0,08	0,09	0,08	0,15	0,13	0,04	0,08	1,15	10%
PFR1	0,16	0,14	0,12	0,11	0,03	0,03	0,01	0,01	0,1	0,03	0,05	0,78	7%
PFR2	0,12	0,12	0,11	0,09	0,04	0,16	0,04	0,01	0,13	0,03	0,05	0,9	8%
PFR3	0,14	0,14	0,12	0,09	0,03	0,22	0,21	0,05	0,13	0,03	0,05	1,21	11%
PFR4	0,07	0,08	0,08	0,05	0,02	0,01	0,01	0,01	0,03	0,02	0,04	0,41	4%
SFTR1	0,16	0,12	0,12	0,12	0,39	0,22	0,29	0,35	0,23	0,19	0,14	2,33	21%
SFTR2	0,17	0,14	0,14	0,12	0,39	0,25	0,33	0,4	0,25	0,58	0,41	3,18	29%

Figure 13 –Prioritization by value

## 8.5 Cost Matrix

### Prioritization by cost

The following figure describes the prioritization of requirements according to the cost of satisfying this requirement. A number and higher percentage means it costs more to satisfy this requirement.

	R1.1	R1.2	R2.3	R4.6	R5.8	PFR1	PFR2	PFR3	PFR4	SFTR1	SFTR2	sum	%
R1.1	0,02	0,05	0	0,05	0,01	0,01	0,01	0,01	0,01	0,02	0,04	0,23	2%
R1.2	0,01	0,02	0,09	0,07	0,01	0,01	0,01	0,01	0,01	0,02	0,04	0,28	3%
R2.3	0,09	0	0,02	0,07	0,01	0,01	0,01	0,01	0,01	0,02	0,05	0,29	3%
R4.6	0	0	0	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,04	0,12	1%
R5.8	0,11	0,14	0,11	0,11	0,04	0,02	0,01	0,03	0,02	0,03	0,08	0,7	6%
PFR1	0,13	0,12	0,11	0,12	0,13	0,06	0,28	0,12	0,22	0,02	0,05	1,35	12%
PFR2	0,11	0,1	0,12	0,11	0,17	0,01	0,06	0,06	0,07	0,03	0,08	0,93	8%
PFR3	0,13	0,12	0,14	0,1	0,08	0,03	0,06	0,06	0,07	0,03	0,08	0,89	8%
PFR4	0,14	0,14	0,12	0,12	0,13	0,02	0,06	0,06	0,07	0,04	0,09	1,01	9%
SFTR1	0,11	0,14	0,14	0,11	0,21	0,39	0,22	0,31	0,22	0,13	0,08	2,06	19%
SFTR2	0,16	0,16	0,14	0,12	0,21	0,45	0,28	0,31	0,29	0,65	0,38	3,15	29%

Figure 14 –Prioritization by cost



## 8.6 Prioritization Plot

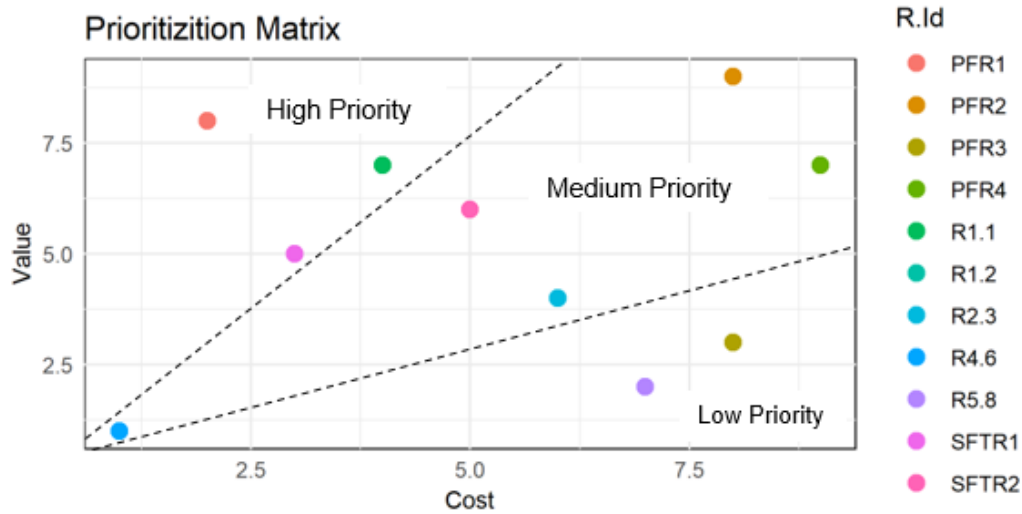


Figure 15 –Prioritization Plot

## 8.7 Supporting documents

- 1) Prioritization calculation document

prioritization  
(1).xlsx

- 2) Prioritization Plot R script

