

## Task 2 – Level 4 Procedural Programming

### Scenario/context

You work as a software developer for a software company called Soft Ireland which is specialised in developing bespoke computer application using a variety of technologies available.

### Task 2:

The project taken by the company is to create an application to process the payroll of the client. The document does not contain enough details about the application. Therefore, you have been asked to interview the client to gather the requirements of the application, and to produce a report highlighting the design specification of the solution in which should include, for example: diagram, inputs, outputs, and any other relevant information about the application.

**Evidence to be handed in:** Electronically submitted report in MS Word format

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### *Overview*

*Global Tour Operators, a worldwide tour operator requires a payroll system to help make payments to their tour guides all around the world. They require a better system that will allow the company to manage their payroll to their external tour guides.*

*In this document we will run through the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts and detailed design that relates to the creation of this payroll system for Global Tour Operators. The aim of this system is to create software that will allow the administrators of Global Tour Operators to be able to manage the payroll for its tour guides.*

## 1.0 Introduction

### 1.1 Purpose and Scope

The purpose and scope of this project involves the creation of a payroll system to manage external tour guides on behalf of Global Tour Operators. We will produce a piece of software that will allow tour guides and administrators of Global Tour Operators to be able to login to the system to carry out a variety of different tasks. There will be different access functionality in the system based on the role of the user.

A tour guide will only have access to bookings and payroll, with restrictive functionality compared to the administrator. A tour guide will be able to flag a booking that they would like to complete and view their payroll.

An administrator will have far more access and functionality within the system, they will be able to access a number of pages on the system, such as – home, tours, tour guides, bookings, commissions, payroll and set up. Each of these pages will have additional functions for the administrator, for example, the tours page will allow the administrator to create, read, update and delete tours as the administrator pleases. This CRUD feature will be available on all of the pages in the system that deals with the database, so that the administrator has control and is able to modify data accordingly.

The system itself will be simple and clean. It will be responsive to allow tour guides and administrators to be able to use their phones in order to access the portal and view data for ease.

The system will feature a login page that is required to have a valid username and password in order to access the system. The administrator will have the ability to create new users as required.

The primary user of this system is the administrator as they control the backend to the bookings. They will be able to control what tours are available, and all that goes with it, such as the tour guides, the commission rates, surcharges, the rate of pay, etc.

The system will be created using C# Language while the database for this project will be created using SQLite and the system used to manage this database will be DB Browser.

This system will be integrated from the already established and produced Howth website.

The website is hosted at <http://iram.innovador-ie.com/>.

The website was created with the use of HTML and CSS.

The new system will integrate the current website, with the addition of a new portal strictly for the access of tour guides and administrators. The new system will be created using a Procedural Programming approach and introducing the use of PHP, along with the use of HTML and CSS.

The system will use SQL and PhpMyAdmin in the backend of the server in order to store its data.

## 1.2 Project Executive Summary

Global Tour Operators require a new payroll system that will allow them to make payments to their tour guides all around the world. The system that they have currently developed is lacking and not reaching their expectations and would like a new system that allows them to manage their payroll to their external tour guides better.



Global Tour Operators have recently updated and redone their Howth website that can be used as a basis to upgrade the website to have a place where members of the general public visiting the website will be able to book a tour. The current Howth website developed by the city site developers have already added a tour section which is able to be reused in order to create the bookings section.

Global Tour Operators, a global tour operator, is requesting the development of a payroll system using an already developed website created using HTML and CSS, to be built using a Procedural Programming approach. The new payroll system will replace their current payroll which is outdated.

The project requirements and methods that Global Tour Operators would like to be featured within the scope of this system includes:

1. Tour Bookings – allow the general public to access the Howth website and a section created within the website that will allow for bookings to be created. Allow end-users to be able to book a tour by providing their information, such as their name, contact number and email address, and selecting a tour, date of the tour and number of people they would like on the tour.
2. Booking Reference – Issue a booking reference after a user has submitted a booking
3. Storing the data Tour Bookings – store this data in the backend of the system, that will only allow administrators and tour guides to be able to access. Administrators will be able to create, read, update and delete bookings while tour guides will only be able to read and assign tours to themselves.
4. Login System – Allows tour guides and administrators with credentials to be able to access the payroll system. Functionality depends on the role of the user logged in.
5. Tours – Only to be accessed by administrator. Allows admin to create, read, update and delete tours. (CRUD)
6. Commissions - Only to be accessed by administrator. Allows admin to create, read, update and delete commissions. (CRUD)
7. Tour Guides - Only to be accessed by administrator. Allows admin to create, read, update and delete tour guides. (CRUD)
8. Bookings – to be accessed by both tour guides and administrator. Bookings that have been

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created by the website's end-user will go here, the tour guide will be able to assign a tour to themselves. The administrator will be able to create, read, update and delete bookings. (CRUD)

9. Bookings – When a tour is done, the tour guide/admin will click a completed status
10. Payroll – Only to be accessed by administrator. Allows admin to create, read, update and delete commissions. (CRUD)
11. System - requires all tours completed by the tour guide, based on their experience it will assign a commission to the cost of the tours, and based on the amount of people that have been on the tour.
12. Setup – Only to be accessed by administrator.
13. Navigation bar – payroll system to have navigation menu on the top, with the option for logout on the right.
14. Tour guides to be able to see what they can expect in terms of pay
15. Administrator to be able to see how much money to transfer after the 25% tax allocation has been calculated for revenue services.
16. Database – A database to store all of this information – using Php My Admin on the server side.

## 1.2 Deliverables

This section will provide the assets being produced by the project and the key features.

### **Completed Software using C#**

1. PhpMyAdmin Database Backend
2. Help page using HTML integrated within the system

### **Documentation**

3. Procedural Programming Report Documentation
4. Test Log Report Documentation

### **Functionality**

1. The Howth website has already been developed and established by previous site developers. This will be re-used to add further functionality to the required system.
2. A user will be able to make a booking on the website.
3. A booking reference will be generated after a booking has been created.
4. Tour guides and administrators will have a login page that requires valid credentials in order to access the backend of the system.
5. Administrators will have access to a Tours section. They will be able to create, read, edit and update tours.
6. Administrators will have access to a Tour Guides section. They will be able to create, read, edit and update tour guides.
7. Administrators will have access to a Commissions section. They will be able to create, read, edit and update commissions.
8. Administrators and Tour Guides will have access to a payroll section. Only the administrator will be able to modify payroll related details, and tour guides will only be able to view payslips.

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9. Administrators and Tour Guides will have access to a bookings section. Only the administrator will be able to modify, update and delete bookings, while the tour guide will be able to assign themselves a tour.
10. Set up can only be accessed and modified by the administrator.
11. A navigation bar will be created for the backend of this Global Tour Operators page, that will feature a navigation bar at the top, with the option for a logout on the right.
12. Tour guides to be able to see what they can expect in terms of pay
13. Administrator will be able to see how much money to transfer after the 25% tax allocation has been calculated for revenue services.
14. Database – A database will store all of this information – using Php My Admin on the server side.



## **1.3 Justification**

The justification for this project came from internal issues within Global Tour Operators. They are unhappy with their current payroll processing system, as the company is becoming larger and larger on a global scale, they need to ensure that their systems are up to date and maintainable. They are looking for a better system that will allow them to manage their payroll to their external tour guides. As this system will feature confidential information such as data from users creating bookings, personal information and payroll information, it is essential to ensure that there is security integrated within this system in order to prevent a data leak. Appropriate error-handling is required as it deals with sensitive and personal information.

## **1.4 Design Constraints**

### **1.4.1 System Constraints**

There are not many constraints within this system that we have identified now, apart from the current database being used is Php My Admin. In the future we would hope to use another program such as Heidi SQL, or alternatives that will allow us to develop the database externally.

Security within the system was also a big design constraint – as we are dealing with confidential information it is a big factor to ensure that the system is GDPR compliant and also secure.

### **1.4.2 Assumptions**

There are several assumptions made within this project. For example, the main assumption is that administrator has a username and a password to enter the system. We can supply the user with this information. Once the administrator has credentials to enter the system, they can create additional users and tour guides to allow further access from more users. This system does not allow the tour guide to create a new account, it must be created by the user.

Further assumptions are that the end-user, administrator and tour guide all have a working internet connection and a device that is compatible to browse webpages. This can be a mobile, tablet or a computer. Anything that can access the internet. The system is designed to be responsive, so the webpage can be viewed on any device without any viewing errors. It does not matter what operating system the user is using to view the webpage if they are able to access webpages.

### **1.4.3 Exclusions**

There is a few exclusions within this project – end-users, such as the customers creating the bookings are not able to create accounts. This is perhaps a feature that can be added in the future that would allow them to login, favourite bookings, create a booking and save these bookings that they can then view again later. In the future this is an area that Modern Bank could look to upgrade and include within the system as a separate project.

Other exclusions are the lack of multi-language support. The system only allows for the English language. As the Howth website is based and aimed in Ireland, this shouldn't be an issue, but in the future, this could be an area that the client looks to expand, perhaps on future projects, especially a company like Global Tour Operators – as they function within many countries.

## 1.5 Future Contingencies

There are contingencies in the future that may impact the project and design of the system that can also have an impact on the direction of the development.

### **1.5.1 General Data Protection Regulation (GDPR)**

Currently, **General Data Protection Regulation (GDPR)** is a hot topic as laws regarding GDPR compliance are constantly evolving. It is important to stay on top of it, and to be aware of the changes as it can have massive affects to how a system can store its data. GDPR can cause the direction of the development of the system to change if laws are modified or updated. On May 25 2018, the European Union imposed obligations and regulations regarding the capturing and targeting of data to anyone living within the EU. This had a massive impact on systems and companies not only in the European Union, but all around the world – as visitors from the EU would need their data captured differently, in accordance with the new regulations – as compared to visitors outside of the EU.

This was an extremely strict law that was created with the aim of tighter online privacy and security for the people living in this union. There are harsh penalties and fines for those who violate the privacy and security standards – so it is something that a company must be mindful of, and then integrate within a system. It is equally as important to keep up to date in regard to the current GDPR laws, and to implement these changes within a system that is live.

Essentially, it does have an impact in the development of a system, as the system cannot go live unless it is GDPR compliant, or the company will face fines.

### **1.5.2 Data Encryption**

Another potential aspect that could distract the flow of software development is implementing data encryption within the system. As Global Tour Operators will deal with sensitive and confidential information from customers as well as its employees, it is vital to keep this information secure. This can be aided using Data Encryption. The last thing any company would want is for a data leak, so it is essential to implement this encryption correctly.

Data Encryption would translate and encrypt data into code that only people with restricted access with the use of a secret key known as a decryption key, or password can use in order to read this information. It is recommended that Modern Bank integrates encryption as a data security method in order to secure the data of their passengers.

### **1.5.3 Additional Users**

In the future the system could look to allow new customers to create accounts using the system. Their account could allow for the users to store favourites within the website, and to keep booking history for the users. At the moment, only administrators and tour guides are able to access a login system.

## 2.0 System Overview

The project requirements involve the reusability of HTML and CSS that has been pre-developed by city web designers for the Howth website. This website will integrate the new system with a section that will allow staff, such as the administrators and tour guides to login. This system will follow a Procedural Programming approach, aided using PHP.

The requirements and methods that Global Tour Operators would like to be featured within the scope of this application includes:

1. The Howth website has already been developed and established by previous site developers. This will be re-used to add further functionality to the required system.
2. A user will be able to make a booking on the website.
3. A booking reference will be generated after a booking has been created.
4. Tour guides and administrators will have a login page that requires valid credentials in order to access the backend of the system.
5. Administrators will have access to a Tours section. They will be able to create, read, edit and update tours.
6. Administrators will have access to a Tour Guides section. They will be able to create, read, edit and update tour guides.
7. Administrators will have access to a Commissions section. They will be able to create, read, edit and update commissions.
8. Administrators and Tour Guides will have access to a payroll section. Only the administrator will be able to modify payroll related details, and tour guides will only be able to view payslips.
9. Administrators and Tour Guides will have access to a bookings section. Only the administrator will be able to modify, update and delete bookings, while the tour guide will be able to assign themselves a tour.
10. Set up can only be accessed and modified by the administrator.
11. A navigation bar will be created for the backend of this Global Tour Operators page, that will feature a navigation bar at the top, with the option for a logout on the right.
12. Tour guides to be able to see what they can expect in terms of pay
13. Administrator will be able to see how much money to transfer after the 25% tax allocation has been calculated for revenue services.
14. Database – A database will store all this information – using Php My Admin on the server side.

In order to achieve this, we have designed a context diagram for the system. In this diagram, we have identified the requirements that we feel are needed to be integrated within the system. This includes the creation of tables within a database, which can be seen in the context diagram below.

## 2.1 Context Level Diagram

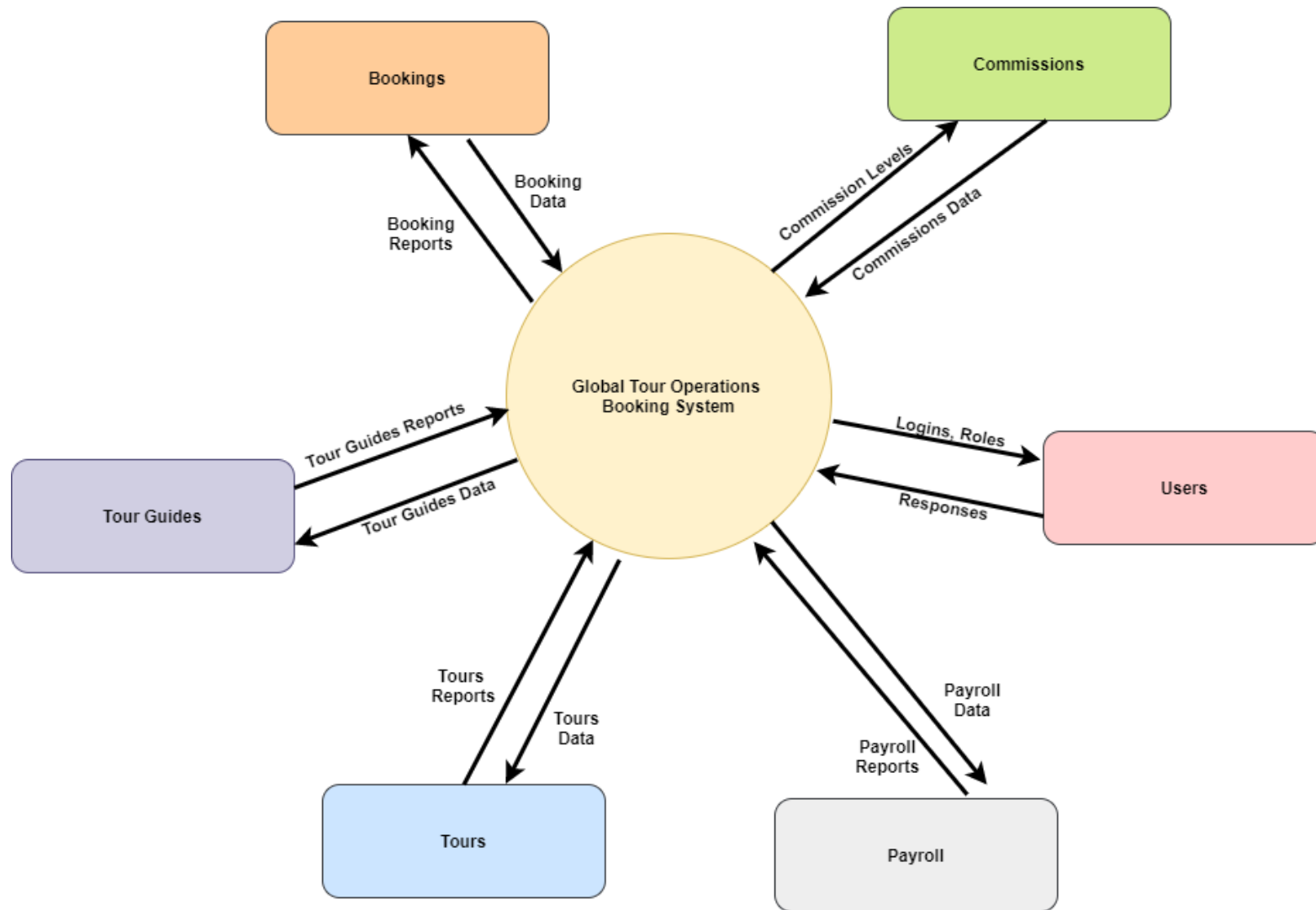


Figure 1: Context Level Diagram

## 2.2 Use Case Diagram

The following use case diagram depicts a representation of the Global Tour Operators Payroll System. It graphically displays the relationship between the users of the backend system – the Administrator and Tour Guides, and the differing access that each of these roles and permissions they have when using the Payroll System.

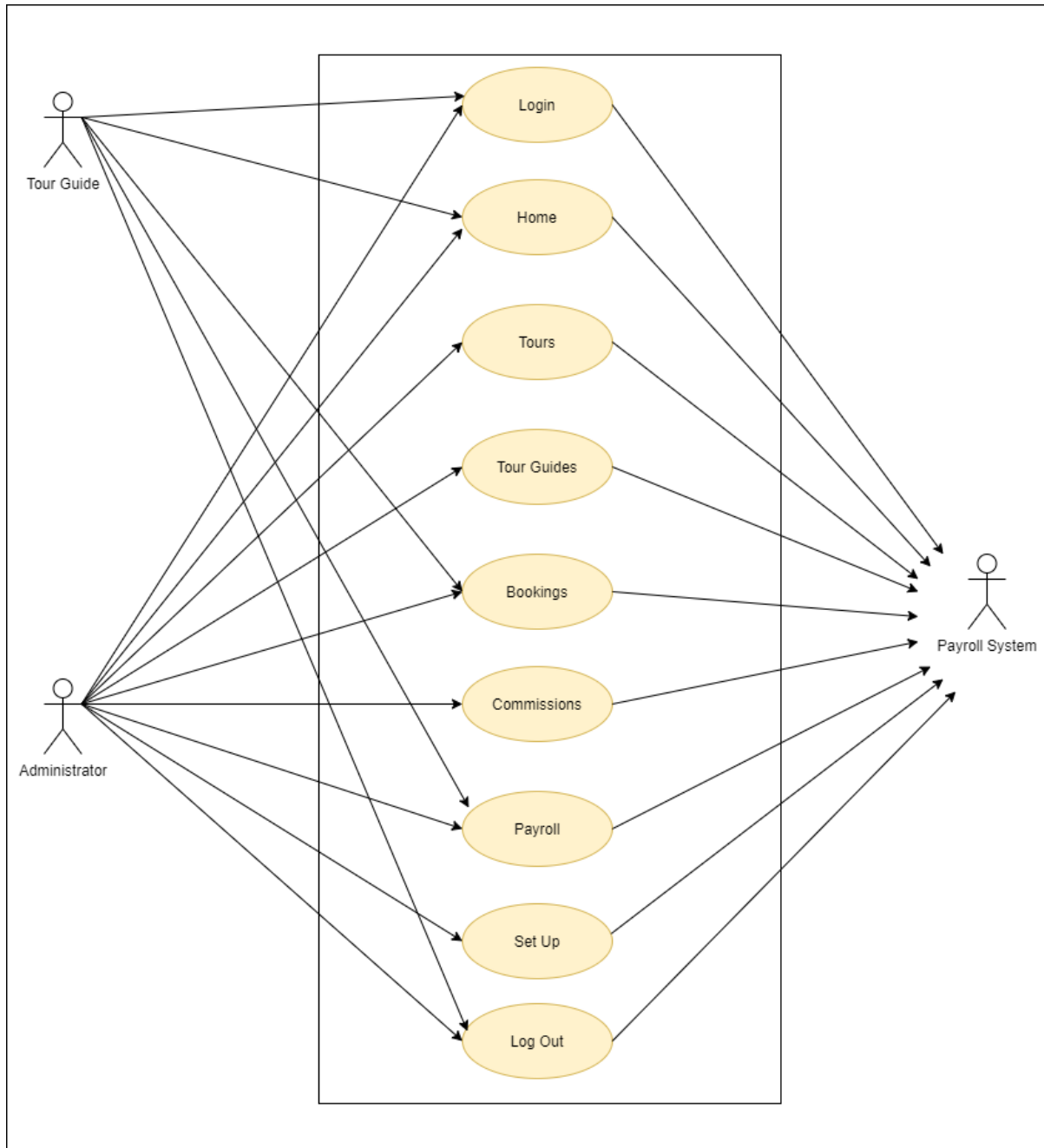


Figure 2:Use Case Diagram

Next, we will go through the data flow diagrams that represent the functions of the system.

### 2.3 Login Level 0 DFD

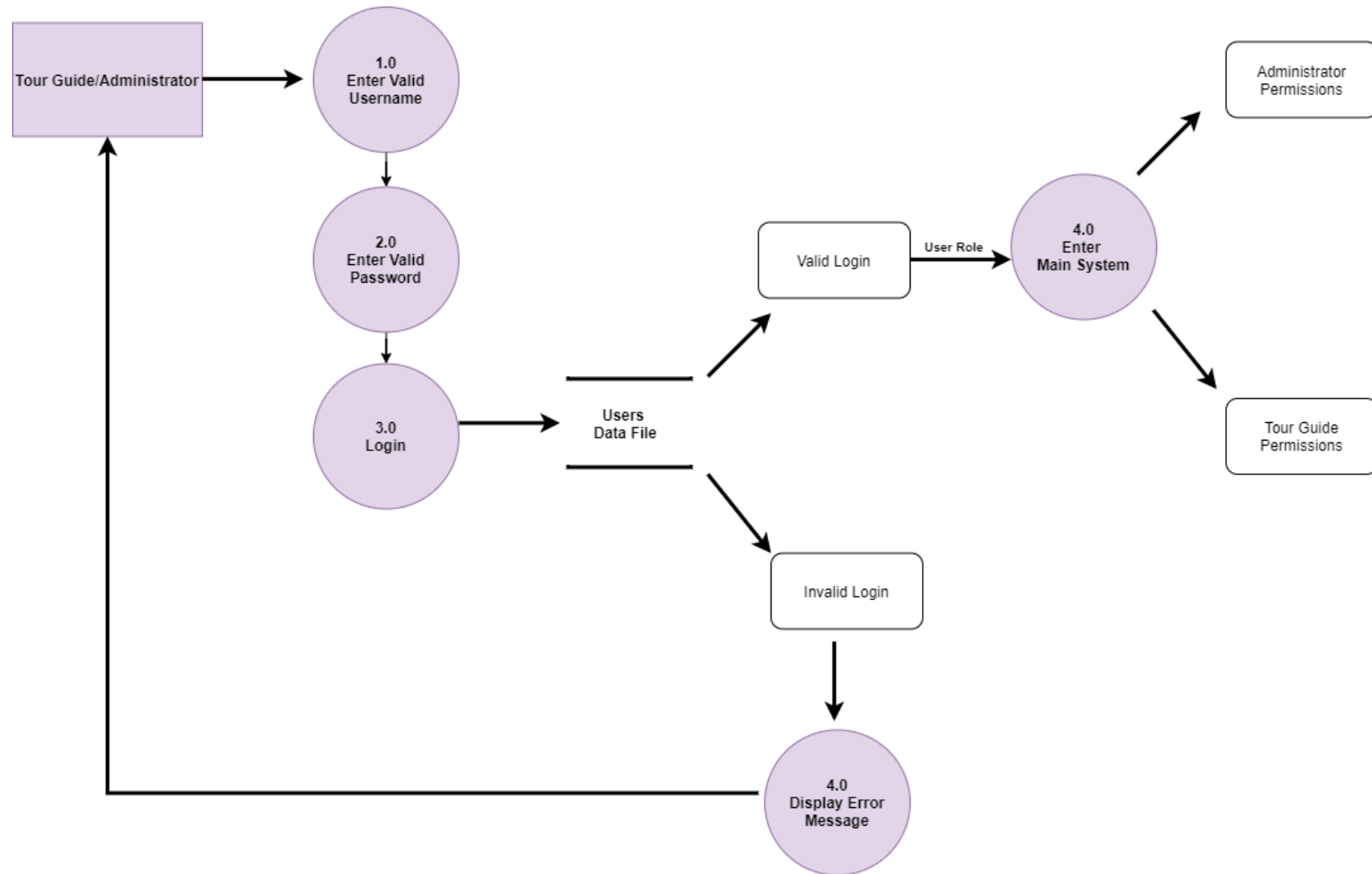


Figure 3: Login Level 0 DFD

## 2.4 Main Menu Level 0 DFD

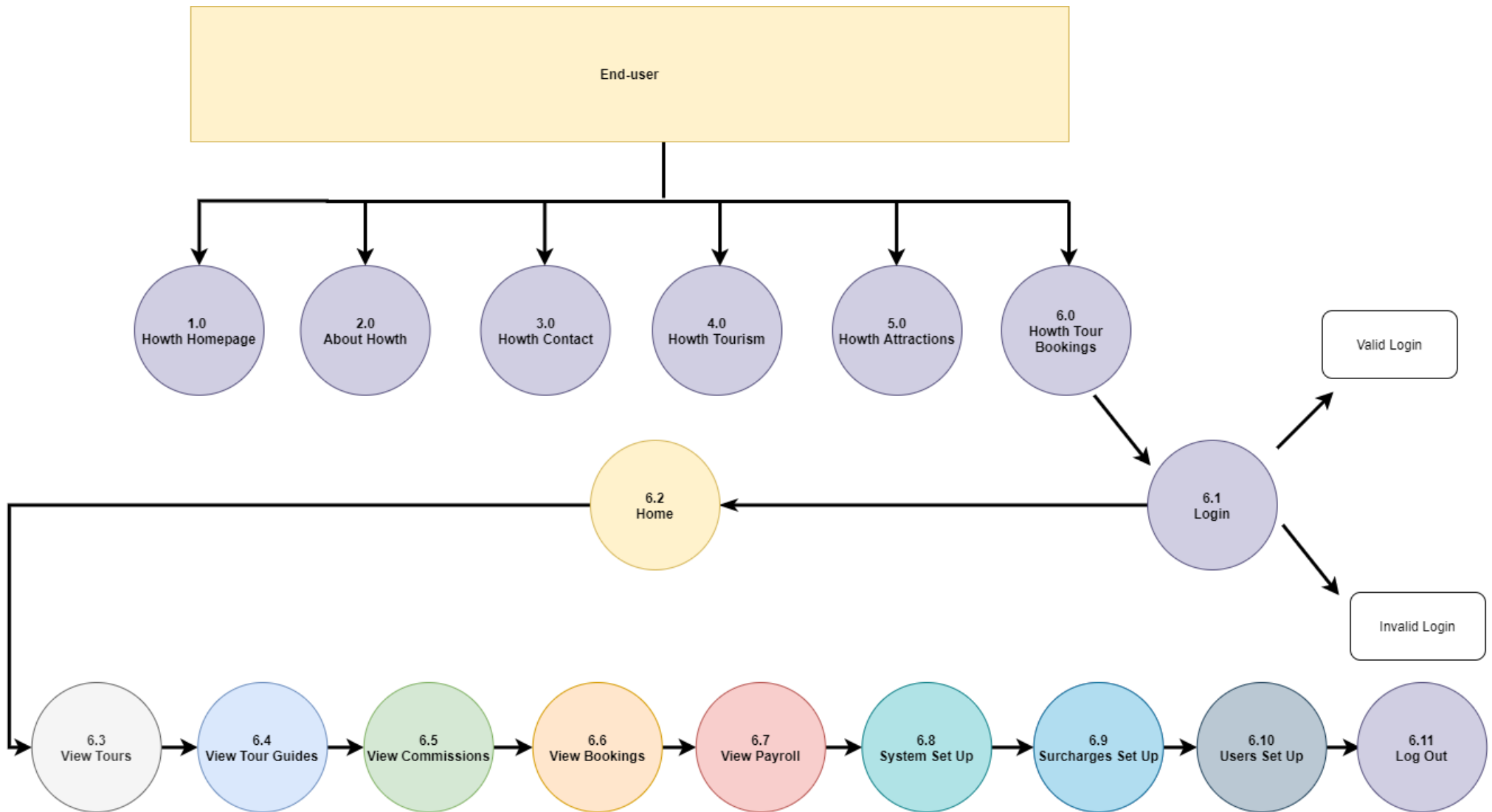


Figure 4: Main Menu DFD 0

### 2.5 Tour Guide User Level 0 DFD

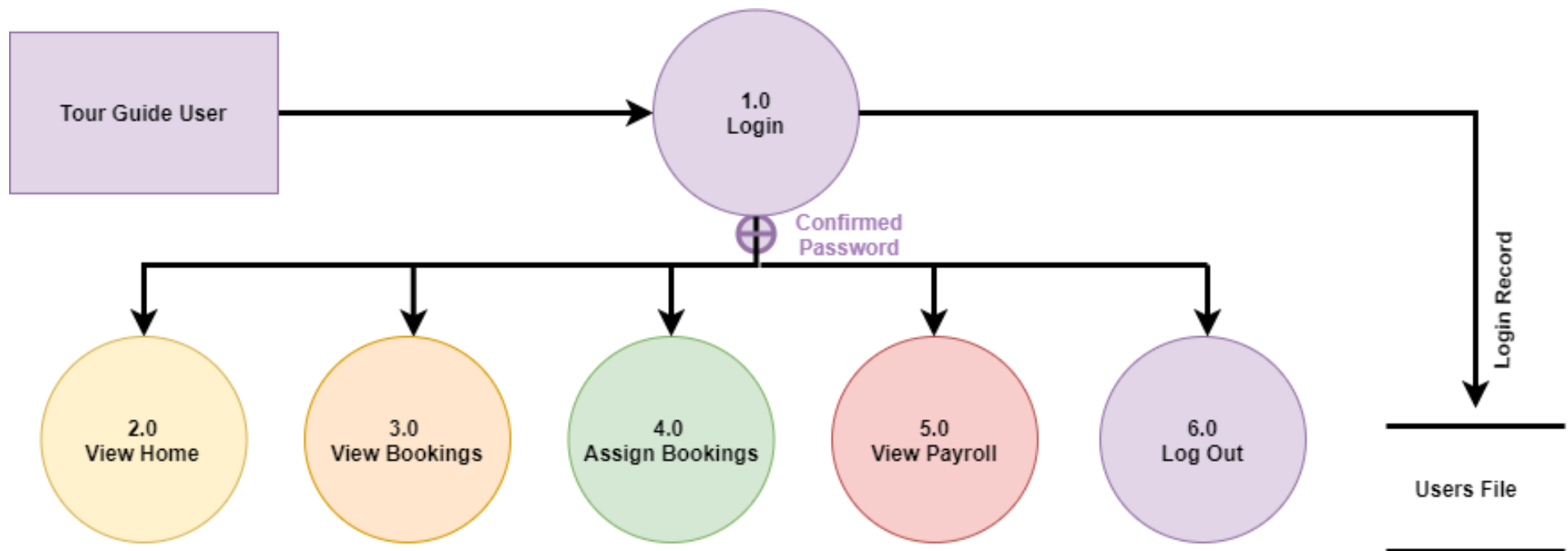


Figure 5: Tour Guide Level 0 DFD



## 2.6 Administrator User Level 0 DFD

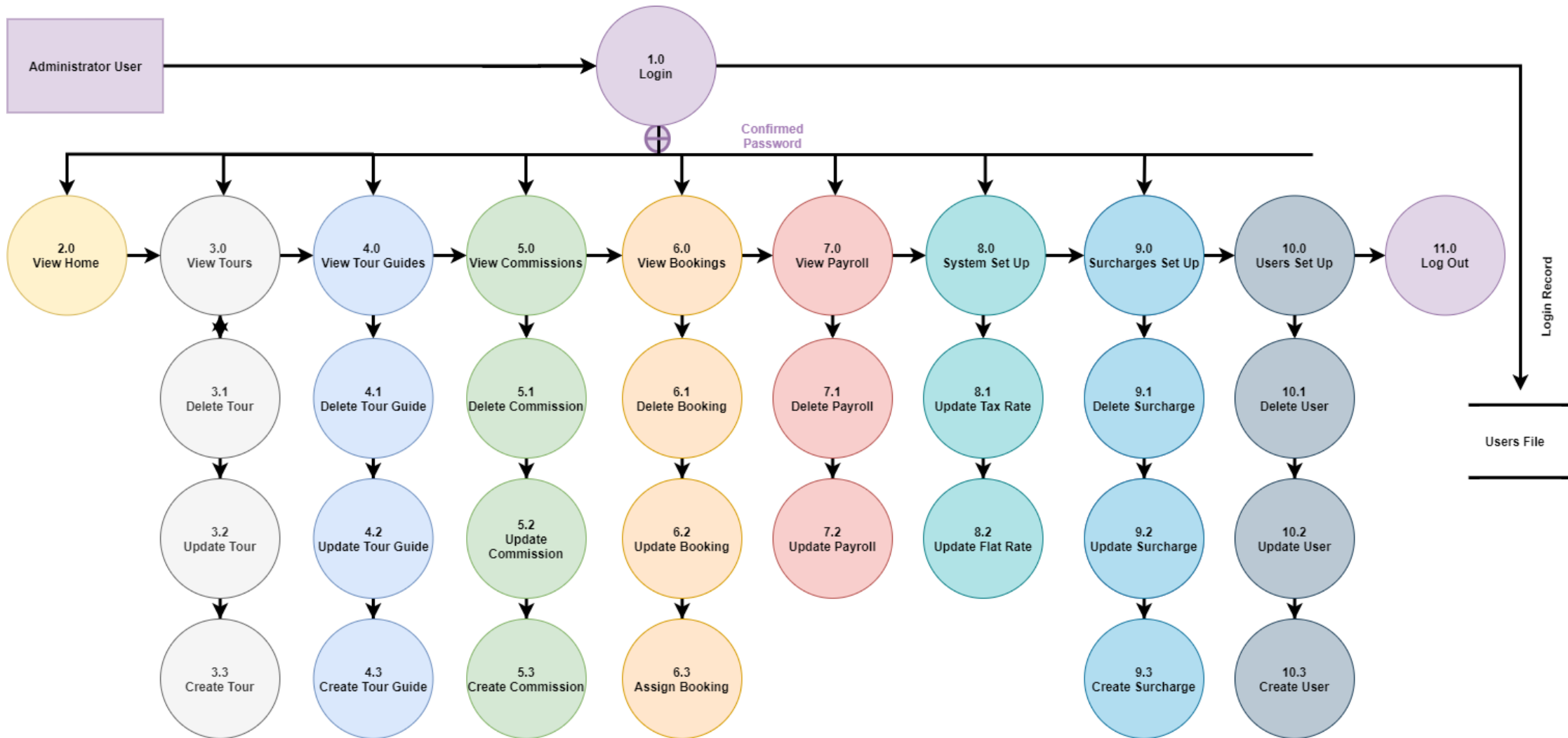


Figure 6: Administrator Level 0 DFD

## 2.7 Tour Bookings (Front-End) Level 0 DFD

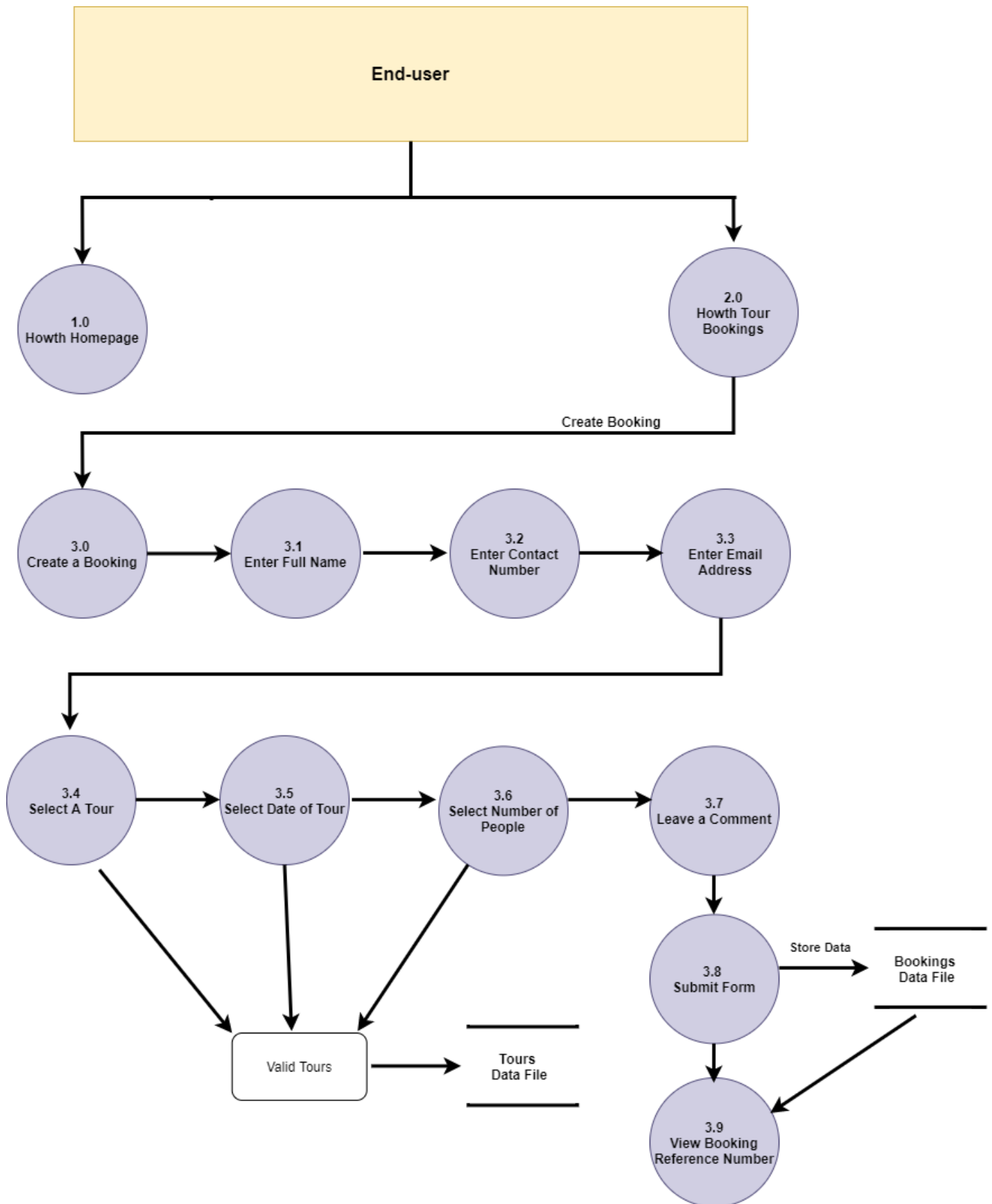


Figure 7: Tour Bookings Level 0 DFD

## 3.0 System Requirements

### Project Description

The project requirements involve a Procedural Programming based system using PHP, HTML and CSS that will feature a backend system that will allow the administrator to create a payroll system. The requirements and methods that Global Tour Operators would like to be featured within the scope of this application includes:






1. The Howth website has already been developed and established by previous site developers. This will be re-used to add further functionality to the required system.
2. A user will be able to make a booking on the website.
3. A booking reference will be generated after a booking has been created.
4. Tour guides and administrators will have a login page that requires valid credentials in order to access the backend of the system.
5. Administrators will have access to a Tours section. They will be able to create, read, edit and update tours.
6. Administrators will have access to a Tour Guides section. They will be able to create, read, edit and update tour guides.
7. Administrators will have access to a Commissions section. They will be able to create, read, edit and update commissions.
8. Administrators and Tour Guides will have access to a payroll section. Only the administrator will be able to modify payroll related details, and tour guides will only be able to view payslips.
9. Administrators and Tour Guides will have access to a bookings section. Only the administrator will be able to modify, update and delete bookings, while the tour guide will be able to assign themselves a tour.
10. Set up can only be accessed and modified by the administrator.
11. A navigation bar will be created for the backend of this Global Tour Operators page, that will feature a navigation bar at the top, with the option for a logout on the right.
12. Tour guides to be able to see what they can expect in terms of pay
13. Administrator will be able to see how much money to transfer after the 25% tax allocation has been calculated for revenue services.
14. Database – A database will store all this information – using Php My Admin on the server side.

## 4.0 System Architecture

For users visiting the Howth website, potential customers booking tours, tour guides, administrators and any person hoping to visit the website, there are several system requirements, based on the method being used. A user may access the website on either a computer, phone or tablet. The system hardware requirements differ for each of these methods which can be seen below.

### 4.1 System Hardware Requirements

The Minimum Hardware Requirements on a **Computer** includes:

	
<b>Keyboard</b>	<b>Mouse</b>
	
<b>Computer</b>	<b>Display Monitor</b>
	
<b>Internet Connection</b>	

1. **Keyboard** – A keyboard is required for this system. The program features an onscreen keyboard for the login and numeric inputs, however, for the input of text, a physical keyboard will be required.
2. **Mouse** – A mouse is essential for the program, as without it the system is completely unusable. The system will go from page to page with the aid of a mouse, in order to input information it is required, as well as viewing the maintenance suite, to add and view airports, as well as bookings, a mouse is needed. Without a mouse, the system would be useless and unusable. It allows for the control of the graphical user interface of the system.
3. **Computer** – A computer is required in order to run this system. Not only is it required to meet the hardware requirements, but also the software requirements. We will speak further about the *minimum system requirements* in the subsequent section to gain further insight.

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4. **Display Monitor** – In order for the user to use the application, it is necessary to have a display monitor connected to the computer. Without the display monitor, the user cannot use the application as they cannot see or run the system and its graphical user interface. It is important to note that this display monitor must be touchscreen in order to allow the customer to use the system as intended – as input is required with the use of an onscreen keyboard.
5. **Internet Connection** – A working internet connection is required in order to access the webpage.

Otherwise, if the device is a smartphone or a tablet, it will require a method of input – either a touchscreen, or a keyboard and a working internet connection in order to access the system. The system has designed to be responsive for all devices.

## 4.2 System Software Requirements

This program will be created using a Procedural Programming based system using PHP, HTML and CSS that will feature a backend system that will allow the administrator to create a payroll system. This system will feature the use SQL for its database, and this will be run using Php My Admin.

The Howth website and payroll system can be viewed on any smart device that can connect to the internet and view webpages. The website does feature the use of newer technologies such as HTML5 and JavaScript, so it is necessary to ensure that the device is able to view this content. It is not available on Mac, mobile phones or tablets.

The Minimum Software Requirements on a **Computer** includes:

1. Updated and latest Operating system such as Google Chrome, Internet Explorer, etc.
2. Windows 7 Operating System or Later
3. 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor\*
4. 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit)
5. 16 GB available hard disk space (32-bit) or 20 GB (64-bit)
6. DirectX 9 graphics device with WDDM 1.0 or higher driver

This is the ideal system specifications that are required to run this website correctly.

If your system fails to meet the system requirements, there may be performance issues, or the program may be incompatible.

### 4.2.1 System Creation Tools

Programming Language	PHP, HTML, CSS, Javascript
Software Tools	<ol style="list-style-type: none"><li>1. <b>Visual Studio Code</b> – used for the creation of the website and payroll system program a</li><li>2. <b>PhpMyAdmin</b> – used to populate and view database tables. Management of the database used in the system</li></ol>

## 5.0 Design

### 5.1 Database Design

As previously mentioned in this document, the management system used to store data is Php My Admin using SQL. We have found through research that this is the most ideal program to browse and create our data on, as it is easy to use and user-friendly, and it is built in on the server-side of the website.

It was necessary to create a connection between the system and the server, creating files such as 'GuidFunctions.php' and 'DatabaseConnection.php' that contains server hosts, passwords, database logins and server login.

#### 5.1.1 Database Management System Files

As we have created a database to store our data, we need to define a data dictionary for each of the tables within the database. The use of the data dictionary is to provide a more detailed account about each of the contents within the database. This includes the names of the fields, the type of data it represents, the size of this data, the format, an example of this data and a description of the data.

The tables used within this database at present include:

1. **Bookings** – this table will store the data associated with the bookings created by end-users. This includes the personal details, such as their name, contact information and the tour they have selected to book, its date and the number of people that will be participating within the tour.
2. **Users** – this table will store the different users that are able to access the payroll system. These users will have different roles, which will allow various permissions and limitations on the system, based on the role of the user. Cannot enter the payroll system without valid credentials.
3. **Tours** – this table stores information relating to tours. Deleted and non-active tours will also be stored here, as well as tours that are active and available to book.
4. **Tour Guides** – this table stores the information relating to tour guides for these tours.
5. **Commissions** – this table stores the information relating to commissions, with differing percentages that a tour guide can earn based on their level, or rank.

## Global Tour Operators Data Dictionary

**Table: Bookings – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the Bookings table
Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the Bookings table
CustomerFullName	Varchar	255		Iram Dev	This is the full name of the Customer
CustomerPhone	Varchar	255		+353 85 / +22 /	This is the phone number of the Customer
EmailAddress	Varchar	255	<u>xxx@xxxx.ie</u>	<a href="mailto:gto@info.com">gto@info.com</a>	This is the email address of the Customer

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<b>CustomerTourSelected</b>	<b>Varchar</b>	<b>255</b>		<b>Howth City tour with wine</b>	<b>This is the tour selected by the Customer</b>
<b>CustomerDateSelected</b>	<b>Date</b>	<b>12</b>	<b>99/99/9999</b>	<b>05/10/1995</b>	<b>This is the Date of the tour selected</b>
<b>CustomerNumberOfPeople</b>	<b>Int</b>	<b>2</b>		<b>3</b>	<b>This is the number of people being booked for a tour</b>
<b>CustomerComment</b>	<b>Varchar</b>	<b>255</b>		<b>A customer can leave a comment, just like this</b>	<b>This is a comment left by the customer</b>
<b>CustomerBookingReference</b>	<b>Varchar</b>	<b>20</b>	<b>HOW-31072020-00000</b>	<b>HOW-31072020-00001</b>	<b>This is the booking reference number for the booking created</b>
<b>Tours_Guid</b>	<b>Varchar</b>	<b>255</b>		<b>1234abc-5678-de9-0fgh-123ijk45678lm9</b>	<b>This is the general ID for the Tours_Guid</b>
<b>TourGuide_Guid</b>	<b>Varchar</b>	<b>255</b>		<b>1234abc-5678-de9-0fgh-123ijk45678lm9</b>	<b>This is the general ID for the TourGuide_Guid</b>



**Table: Users – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the User
Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the User
Username	Varchar	25	XXXXXXXXXXXXX XXXXXXXXXXXXX	Iram123	This is the Username for a User's credentials
Password	Varchar	4	XXXX	1234	This is the Password for a User's credentials
UserFullName	Varchar	255		Iram Dev	This is the full name of the user
Role	Varchar	255		Administrator/Tour Guide	This is the role of the user
TourGuide_GUID	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the TourGuide_GUID
Deleted	Tinyint	1		Default 0	This is to delete a User

**Table: Tours – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the Tours
Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the Tours
TourName	Varchar	255		Thomas Swift	This is the description/name of the type of Tour
TourPrice	Int	11		10.50	This is the price of the tour
Active	Tinyint	1		Default 0	This is to represent if a tour is active or not
Deleted	Tinyint	1		Default 0	This is to delete a Tour

**Table: Tour Guide – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the Tour Guide
Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the Tour Guide
TGFullName	Varchar	255		Iram Dev	This is the full name of the tour guide
TGPhone	Varchar	255		+353 85 / +22 /	This is the phone number of the Tour Guide
TGEmail	Varchar	255	<u>xxx@xxxx.ie</u>	<a href="mailto:gto@info.com">gto@info.com</a>	This is the email address of the Tour Guide
Commissions_Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the Tour Guide
Active	Tinyint	1		Default 0	This is to represent if a tour guide is active or not
Deleted	Tinyint	1		Default 0	This is to delete a Tour Guide

**Table: Commissions – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the Commissions
Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the Commissions
CommissionLevel	Varchar	255		Intern	This is the Commission Level
CommissionPercentage	Decimal	5,1		10%	This is the Commission Percentage
Active	Tinyint	1		Default 0	This is to represent if a commission is active or not
Deleted	Tinyint	1		Default 0	This is to delete a Commission

**Table: SetupSystem – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the SetUp
TaxRate	Int	11		10%	This is the rate of Tax
FlatRate	Decimal	10,2		10.50	This is the flat rate

**Table: Surcharges – Data Dictionary**

Field Name	Field type	Field Size	Format	Example	Description
Uid	Bigint	20		1 ...	This is the unique ID for the Surcharges
Guid	Varchar	255		1234abc-5678-de9-0fgh-123ijk45678lm9	This is the general ID for the Surcharges
MonthNumber	Varchar	2		12	This is the number that represents the months of the year
ChargeValue	Decimal	5,1		10.5	This is the charge value

## Global Tour Operators Entity Relationship Diagram

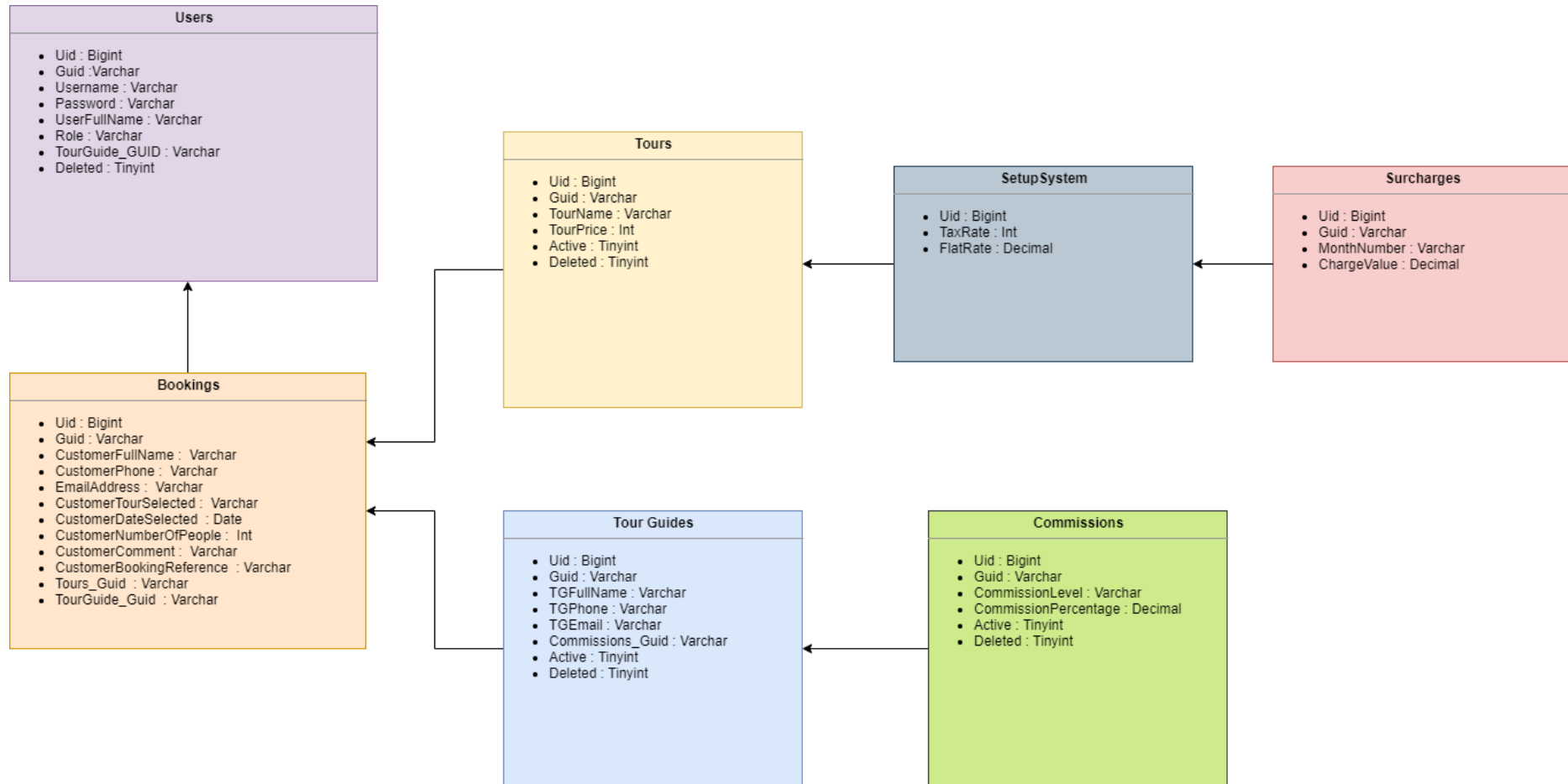


Figure 8: Entity Relationship Diagram

## 6.0 Human-Machine Interface

Regarding the human-machine interface, we have produced prototype models of what we envision the ***Global Tour Operators Payroll System*** will look like. The goal we have for the graphical user interface is to keep it simple and not to be too different to the style of the Howth website, while remaining a different portal. Our aim was to keep the program simple and functional, while remaining user-friendly.

**Note:** The following images are only prototypes of the program and may *differ to the final end product*.



## 6.1 Inputs

### Booking A Tour

HOMEABOUTCONTACT

HOWTH

TOURISMATTRACTIONSBOOKINGS

MAKE A...

BOOKING

Please fill in the form in order to book a tour!

We hope you enjoy all the best of what Howth has to offer!

New Booking

Staff Login

Hello!

BOOKING INFORMATION

Full NameContact Number

Email Address

Tour Selection:  
---Please Select A Tour---

Date of Tour: DD/MM/YYYY

Number of People: Please select an amount

Any additional information or comments may be entered here.

SUBMIT

Figure 9: Booking A Tour

## Booking a Tour

This web page focuses and deals with the potential end-user creating a booking for a tour. They can begin this process by clicking on the 'Bookings' tab in the navigation bar, that is located at the top of the webpage throughout the entirety of the Howth website. Once they have accessed this webpage, they will be able to fill in their details regarding the booking.

All the fields in this booking form are required, so it is important for the user to give accurate information. The tour booking requires the following from the end-user booking a tour,

1. Full Name
2. Contact Number
3. Email Address
4. Tour Selected (Available options in dropdown list)
5. Date of Tour
6. Number of People
7. Any comments they may have

All this information is required in order to process the booking, and the user will not be able to continue with the booking until all of the fields are completed. Once they have been completed, the user will be able to click the 'submit' button and make their booking. Their booking will have successfully come through if they are presented with a booking reference number that has been generated on screen.

The information from this booking will then be stored in a database, which will then be used in the Global Tour Operators portal with access for the administrators to view, edit and delete, and the tour guides to view and assign tours to themselves.

## User Login

GLOBAL TOUR OPERATORS

[FAQS](#)

### STAFF LOGIN

Valid credentials are required.



Username

Password

SUBMIT

*Figure 10:User Login*

## User Login

A user would need to access the 'Bookings' webpage from the homepage, and then click on a button located on the left side of the page that says, 'Staff Login'. This will allow the user to proceed to the login page that would grant access to the backend portal for Global Tour Operators.

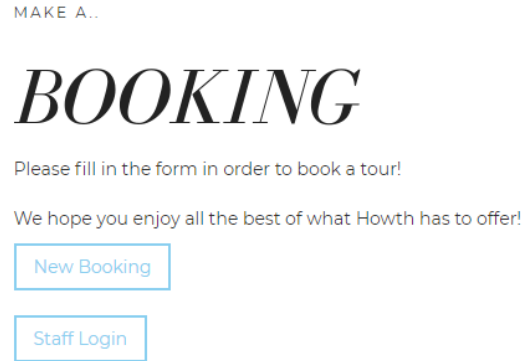


Figure 11: Staff Login

Once the user is on this login page, they may enter in their credentials – their username and password. This portal does not allow for the creation of new accounts, it simply allows access for already created accounts, which have been verified by the system administrator. This portal only allows access for the tour guides and administrators of Global Tour Operators. The website does not feature accounts for customers.

If the user has successfully logged in with their credentials, they will be redirected to the Global Tour Operators portal. There are two different user roles on this system, which both have different privileges and access. An administrator will be able to access the entire portal,

1. Home
2. Tours
3. Tour Guides
4. Bookings
5. Commissions
6. Payroll
7. Set Up

Whereas the tour guide will have much more limited access and only be able to view Home, Bookings and view their Payroll.

## Task 2 – Level 4 Procedural Programming

### Home

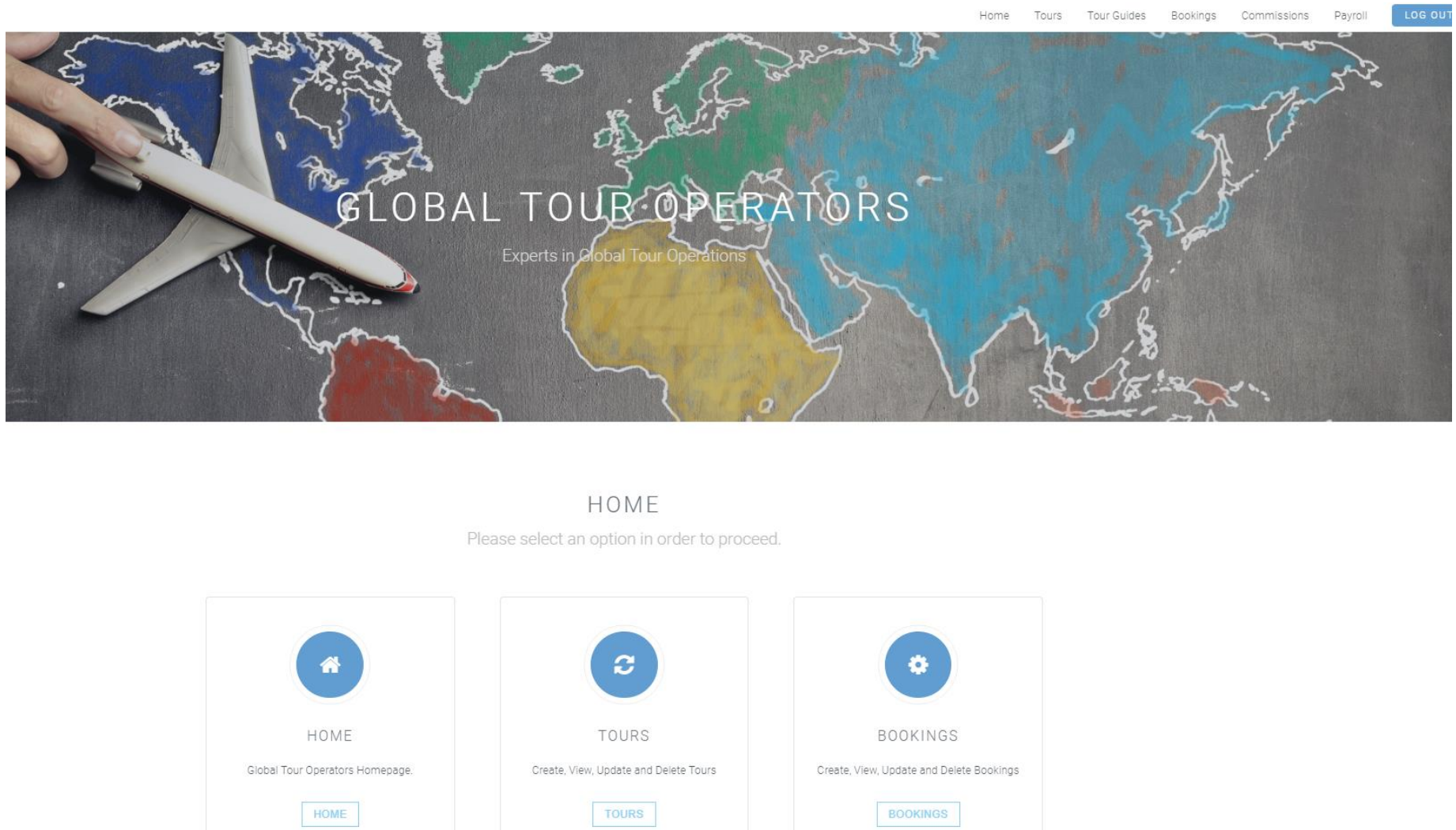


Figure 12: Home

## Home

The homepage on the portal consists of containers that will redirect the user to the chosen link they desire. Similarly, they can use the navigation bar at the top of the webpage to direct themselves through the portal. There is also a log out button available on the navigation bar that will log the user out of the portal. The homepage also has a large header with a global map that goes with the branding and ethos of Global Tour Operators.

The administrator and tour guides both have different access and privileges within this portal as previously discussed.

An administrator will be able to access the entire portal,

1. Home
2. Tours
3. Tour Guides
4. Bookings
5. Commissions
6. Payroll
7. Set Up

Whereas the tour guide will have much more limited access and only be able to view Home, Bookings and view their Payroll.

## Task 2 – Level 4 Procedural Programming

### Tours

























GLOBAL TOUR OPERATORS					Home	Tours	Tour Guides	Bookings	Commissions	Payroll	LOG OUT
You are logged in as: Administrator.											
TOURS											
Create, Edit and View Tours											
Action	ID	Tour Name	Price		Active						
 	1	Howth Cliff Walk with Afternoon Tea	€ 36								
 	2	Malahide Castle, Dublin Bay and Howth Village Half-Day Tour from Dublin	€ 27								
 	3	Full-day Private Dublin City Highlights Tour from Howth	€ 500								
 	4	Howth Day Trip from Dublin	€ 30								
 	5	Howth Art Workshop - Write out your life stories, see your life in a mirror of words	€ 35								
 	6	Craft Beer & Seafood Trail with a Local	€ 81								
 	7	Howth Summit with Drinks on Arrival	€ 28								
 	8	Cliff Path Loop with Afternoon Tea	€ 12								

Figure 13: Tours

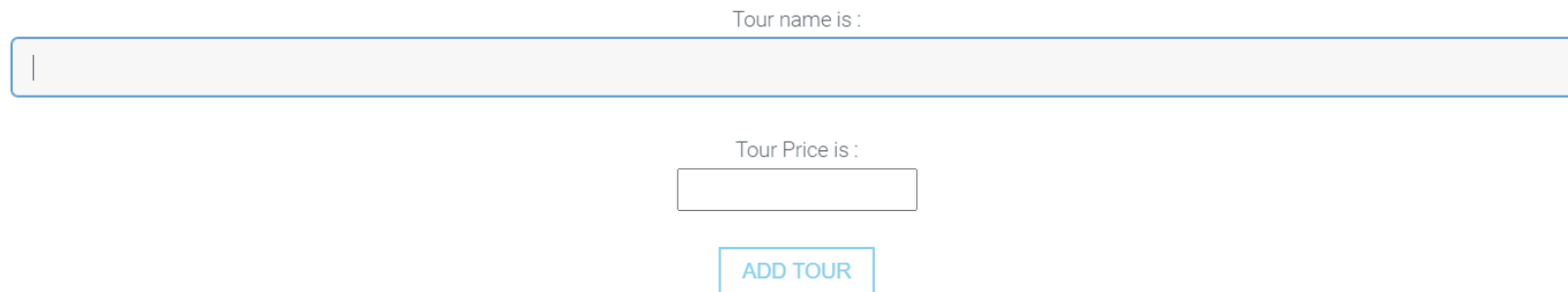
## Tours

Only an administrator will have access to this webpage. This page controls and maintains details relating to tours. These tours are then linked to the bookings page on the Howth website. This list of active tours is what the user looking to make a tour booking can select.

The administrator has the option to be able to create, read, update and delete any of the tours, as well as change the status from active to inactive if required. This will then be reflected when a user goes to make a booking, if a tour is inactive, it will not be in the options of tours to book.

### ADD A NEW TOUR

Please provide details of the new tour you would like to create.  
Please include a Tour Name with a brief description and a suitable price.



Tour name is :

Tour Price is :

ADD TOUR

*Figure 14: Add New Tour*

The administrator will be able to add a new tour, supplying both its name and price information. By default, the active and deleted columns are set to 0, so they are both active.



## Task 2 – Level 4 Procedural Programming

### Tour Guides

You are logged in as: Administrator.

#### TOUR GUIDES

View, Edit and Delete Tour Guides

SELECT \* FROM tourguide LEFT JOIN commissions ON commissions.Guid = tourguide.Commissions\_Guid WHERE tourguide.Deleted=0
















Action	ID	Full Name	Contact Number	Email Address	Commission Level	Commission Percentage	Active
 	5				Advanced	12.0	
 	7	Immi Hearts	01 2345678	immihearts@gto.com	Executive	25.0	
 	7				Executive	25.0	
 	7				Executive	25.0	
 		Olive Summer	087 123 4567	olivesummer@gto.com			

Figure 15: Tour Guides

## Tour Guides

Only an administrator will have access to this webpage. This page controls and maintains details relating to tour guides. The administrator creates the tour guides and decides the commission level they can earn, based on their experience. The administrator has the option to be able to create, read, update and delete any of the tour guides, as well as change the status from active to inactive if required.

### ADD A NEW TOUR GUIDE

Please provide details of the new tour guide you would like to add

Please include the Tour Guide's personal information such as their Full Name, Contact Number and an Email Address.

Tour Guide name is :

Tour Guide Phone is :

Tour Guide Email is :

Comm Selection:

---Please Select A Commission---

ADD TOUR GUIDE

Figure 16: Add New Tour Guide

The administrator will be able to add a new tour guides, supplying both its name, phone number, email address, and selecting a commission rate for the tour guide from a dropdown list. By default, the active and deleted columns are set to 0, so they are both active.

## Task 2 – Level 4 Procedural Programming

### Commissions

GLOBAL TOUR OPERATORS

HomeToursTour GuidesBookingsCommissionsPayroll

LOG OUT

You are logged in as: Administrator.

COMMISSIONS

Create, Edit and View Commissions

























Action	ID	Commission Level	Commission Percentage	Active
 	1	Intern	1.0%	 .....
 	2	Apprentice	2.0%	 .....
 	3	Beginner	5.0%	 .....
 	4	Intermediate	7.0%	 .....
 	5	Advanced	12.0%	 .....
 	6	Senior	20.0%	 .....
 	7	Executive	25.0%	 .....
 	8	Elite	35.0%	 .....

Figure 17: Commissions

## Commissions

Only an administrator will have access to this webpage. This page controls and maintains details relating to commissions that the tour guides will earn. The administrator can create commissions and decides the percentage. The administrator has the option to be able to create, read, update and delete any of the commissions, as well as change the status from active to inactive if required.

### ADD A NEW COMMISSION

Please provide details of the new commission you would like to create.

Please include a title for the level and a suitable percentage.

Commission Level :

Commission Percentage :

ADD COMMISSION

*Figure 18: New Commission*

The administrator will be able to add a new commission, supplying both its name, in terms of a level and a commission percentage. By default, the active and deleted columns are set to 0, so they are both active.

## Task 2 – Level 4 Procedural Programming

### Bookings

#### BOOKINGS

Assign, Edit and View Bookings





















Assign Booking	Booking Reference	Customer Name	Tour	Customer Comment	Tour Date	Number of People	Tour Guide Assigned	Completed
	HOW-A9DT6	Ariana Ray	Claremont Beach	Arriving from Portugal, this place has been on our hit list for years!	2020-08-19	2	Nuala Cullen	
	HOW-HYPSI	Samantha Millar	Craft Beer & Seafood Trail with a Local	I see food, I eat it..	2020-08-04	1	Tour Guide Test	
	HOW-ZTD8Y	Karl Poutin	Howth Art Workshop - Write out your life stories	Art and Howth?? Sign me up!	2020-08-16	1	Thomas Recklin	
	HOW-CRUCQ	Mari Sullivan	Malahide Castle and Howth Village Half a Day Tour from Dublin	Looking forward to this!	2020-08-25	1	Tour Guide Test	
	HOW-JG10F	Jordan Chambers	Howth Day Trip from Dublin	Travelling from Brazil to Howth!!!	2020-08-12	2	Tour Guide Test	
	HOW-8QKTG	Amy-Louise Frazier	Malahide Castle and Howth Village Half a Day Tour from Dublin	Excited!!!	2020-08-20	5	Liam O'Connell	
	HOW-2NOI9	Georgina Sparks	Craft Beer & Seafood Trail with a Local	Excited to visit Howth!	2020-08-11	2	Tour Guide Test	
	HOW-03FH3	Louisa Allen	Howth Summit with Drinks on Arrival	Greetings from the UK!	2020-08-06	2	Nuala Cullen	
	HOW-PVZTL	Enya Joyce	Cliff Path Loop with Afternoon Tea	I hope there's a variety of different teas available!	2020-08-06	3	Olive Summer	
	HOW-TY6LI	Maureen McEvoy	Howth Day Trip from Dublin	A group of five to be seated together please.	2020-08-14	5	Taylor Manning	

Figure 19: Bookings

## Bookings

Both the administrator and tour guide have access to this page. This page stores the data for bookings made on the front end of the Howth website. Here, users are able to assign a tour to themselves, or the administrator can select a tour guide they would like to assign it to.

This table contains a completed column that once it has been clicked, will no longer allow for edits, or for the tour to be uncompleted.

It is essential for these tours to be completed in order to process a payroll, as it is required to calculate the pay of a tour guide.

ASSIGN TOUR GUIDE

Assign a Tour Guide to a Booking

Select tour guide for tour:

None Selected

UPDATE BOOKING

*Figure 20: Assign Booking*

# System Set Up

GLOBAL TOUR OPERATORS

[Home](#) [Tours](#) [Tour Guides](#) [Bookings](#) [Commissions](#) [Payroll](#) [Setup](#) [Log Out](#) [FAQS](#)

WELCOME ADMINISTRATOR TEST,  
YOU ARE LOGGED IN AS: ADMIN

## SYSTEM SET UP

Allocating rates for Tax and Flat Rates.

Tax Rate Value:

Flat Rate Value :

[Update](#)

Figure 21: System Set Up

Only the administrator is granted access to this page. The system set up relates to setting the tax rate and flat rate values. These rates are required in order to calculate the payroll and changing them will change the calculation of payrolls calculated previously. They can fluctuate, and only the administrator is able to change it.

Surcharges

GLOBAL TOUR OPERATORS

WELCOME ADMINISTRATOR TEST,  
YOU ARE LOGGED IN AS: ADMIN

SURCHARGE SET UP

Create, Edit and View Surcharges

Home

Tours

Tour Guides

Bookings

Commissions

Payroll

Setup

Log Out

FAQS





Action	ID	Month	Value
	1	February	0.6%
	2	August	15.0%
	5	July	0.5%
	6	November	1.3%

Figure 22: Surcharges



## Surcharges

Only an administrator will have access to this webpage. This page controls and maintains details relating to surcharges depending on the month of the tour. The administrator can create surcharges and modify them.

### ADD A SURCHARGE

Please provide details of the surcharge you would like to create.

---

Please Select a Month:

---Please Select A Month---

Surcharge Percentage:

ADD SURCHARGE

*Figure 23: Add Surcharge*

The administrator will be able to add a new commission, supplying both its name, in terms of a level and a commission percentage. By default, the active and deleted columns are set to 0, so they are both active.

## Task 2 – Level 4 Procedural Programming

### Users

GLOBAL TOUR OPERATORS					Home	Tours	Tour Guides	Bookings	Commissions	Payroll	Setup	Log Out	FAQS
USERS SET UP					Create, Edit and View Users								
ID	Full Name	Password	Username	Role									
1	Administrator Test	123	ad	admin									
6	Tour Guide Test	123	tg	tourguide									
8	Iram Mehdi	password	iram123	admin									
9	Liam O'Connell	password	LiamOConnell	tourguide									
10	Olive Summer	olive123	OliveSummer	tourguide									
11	Nuala Cullen	nuala098	NualaCullen	tourguide									
12	Thomas Recklin	thomasr756	thomasrecklin	tourguide									
13	Taylor Manning	taytayman12	taylormanning	tourguide									

Only an administrator will have access to this webpage. This page controls and maintains details relating to users. The administrator can create users here and assigning roles to each of these users which may provide different accessibility depending on the role.

The administrator will be able to add a new user, supplying their name, username, password and role.

## Users

### ADD NEW USER

Please provide details of the new user you would like to create.

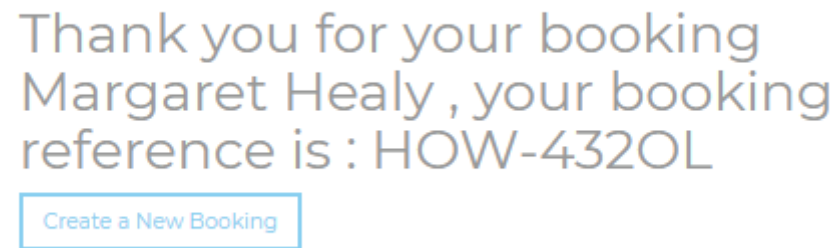
Username	<input type="text"/>
Password:	<input type="password"/>
FullName:	<input type="text"/>
<hr/>	
Please Select a Role:	<input type="text" value="---Please Select A Role---"/>
<hr/>	
Select Tour Guide:	<input type="text" value="---Please Select A Commission---"/>
<hr/>	
<input type="button" value="ADD NEW USER"/>	

Figure 24: Add New User

## 6.2 Outputs

### Booking Reference

A booking reference number will be generated on the front-end of the Howth website when a booking has been successfully created by a potential customer. This reference number will appear on the screen for the customer to take note of in case the need of a reference. This reference number is populated and stored within the bookings table within the system's database alongside all of the details of the customer's booking.



*Figure 25: Booking Reference*

## Task 2 – Level 4 Procedural Programming

### Payroll



Both the administrator and tour guide users are able to access the payroll. The payroll will require the user to input both a start date and an end date. In the case of the administrator, additionally they will be required to select a tour guide from a dropdown list, the tour guide who's payroll they would like to view, on the selected dates they have chosen.

After the users have clicked submit, the payroll for their selection will show. The tour guide user will only be able to see their own payroll on the dates they selected.

WELCOME ADMINISTRATOR TEST,  
YOU ARE LOGGED IN AS: ADMIN

PAYROLL

Select a Date Range to view Payroll

Start Date:   End Date:  

Select a Tour Guide to view Payroll:

Please Select a Tour Guide

SUBMIT

Figure 26: Payroll (Admin)

PAYROLL

Select a Date Range to view Payroll

Start Date:

End Date:

SUBMIT

Figure 27: Payroll (Tour Guide)

## Task 2 – Level 4 Procedural Programming

GLOBAL TOUR OPERATORS

Bookings

Payroll

Log Out

FAQS

WELCOME TOUR GUIDE TEST,

YOU ARE LOGGED IN AS: TOURGUIDE

PAYROLL FOR TOUR GUIDE TEST,

DATE RANGE SELECTED: 2020-08-08 - 2020-08-28

Booking Reference	Tour Name	Total Price	Surcharge %	Surcharge Amount	Commission Percent %	Commision Earned	Flat Rate	Line Total
HOW-CRUCQ	1 X €27	€27.00	15.0%	€ 31.05	35.0%	€ 10.87	€10.00	€20.87
HOW-JG10F	2 X €30	€60.00	15.0%	€ 69.00	35.0%	€ 24.15	€10.00	€34.15
HOW-2NOI9	2 X €19	€38.00	15.0%	€ 43.70	35.0%	€ 15.30	€10.00	€25.30
	5	€125.00		€143.75		€50.31	€30.00	€80.31

Description	Value
Total Commision Earnings	€ 80.31
Tax Rate for Revenue 25%	€ 20.08
Payment to your account	€60.23

Figure 28: Payroll Generated

Once the payroll has been generated, it will display at the top, the name of the user who's payroll you are viewing, along with the date range that was selected. If there are any bookings that were assigned to this tour guide that have been completed within this range, it will be populated into this table here.

The payroll will display the tour name, the total price of the tour, the surcharge and its amount, the commission percentage, along with the amount of commission earned, a flat rate and a line total when there is a tour booking reference available. Under this is a total line that will display the amount of tours, the total price of all the tours completed, the total surcharge amount, commission earned, flat rate and the line total.