

Systems Analysis Report

Object-Oriented Systems Analysis

Submitted by:

Virgilio Querubin - X00078086

Aleksei Harlasov - X00116756

Instructor:

Keith Kelly

Table of Contents

I.	Introduction	Page 3
II.	The Project	Page 4 – 5
III.	Class Identification for Choosing a Holiday	Page 6 – 7
IV.	Class Identification for Booking a Holiday	Page 7 – 8
V.	Class Identification for Customer Service	Page 9
VI.	Class Identification for Changing a Holiday	Page 9 – 10
VII.	Class Identification for Holiday Cancellation	Page 10 – 11
VIII.	Class Identification for Holiday Evaluation	Page 11 – 12
IX.	Class Candidates	Page 12
X.	Data Associated	Page 12 – 13
XI.	Class Diagram 1	Page 13
XII.	Booking Systems	Page 14
XIII.	Class Diagram 2	Page 15
XIV.	CRC Card Example	Page 16
XV.	Data Dictionary	Page 16
XVI.	Conclusion	Page 17
XVII.	References	Page 18

I. Introduction

This report aims to demonstrate the use of Object-Oriented approach in the way systems are designed. From use case descriptions presented, the team worked through a process of noun identification in order to find classes.

Each noun or noun phrase has to go through the stages for class identification. Nouns discarded are either, redundant, vague, meta-language, outside the scope of the system, an attribute or an operation.

In Object-Oriented Analysis and Design, a class indicate a collection of similar objects and relationship that exist among them. A class has attributes and performs operations or methods.

After class identification, the next step was to identify data associated with each class. With the use a UML modelling tool, class diagrams were created. Class diagrams document the classes and relationships involved in an individual use case (Shelly, G., Cashman, T., and Rosenblatt, H. 2008).

For the specifics of this project, a research was conducted on booking systems particularly online or web booking systems. A section of this report was allocated where online booking systems were discussed.

II. The Project

In your role as a systems analyst you have been requested to carry out analysis for an online Travel Agency booking system. You have been presented with the use case descriptions for the proposed system which were completed by the senior systems analyst. As part of the analysis you are required to perform a number of tasks which are listed below.

COMPANY BACKGROUND

TravelLite Ltd. is an established travel agency company, which specialises in round the world trips. The company wishes to set up an online service in order to attract more customers in different parts of the country with the proposed goal of an increase in sales revenue.

USE CASE DESCRIPTIONS

Choosing a Holiday

Potential clients are advised to initially read the TravelLite Ltd., magazine to help them when planning their holiday. The TravelLite Ltd., magazine gives details on flights, accommodation, specialist tours as well as information regarding flight-only options which includes the very popular round the world trip ticket, which is sold at a competitive price. Costs are provided for each category and they are presented on a seasonal basis. The TravelLite Ltd., magazine is reprinted every 6 months. The magazine content is divided into continents for readability purposes. The magazine content is prepared by the travel agency manager.

Clients can request a meeting with a travel representative to put together a holiday package which is suitable to their needs. Normally, the client meeting with the travel representative comprises of the client specifying the holiday code they have chosen from the TravelLite Ltd., magazine, the holiday dates and number of persons. Alternatively, the client can request a flight only option and then meet with the representative to evaluate accommodation and other options. The travel representative will then query availability of the holiday code, flight code and additional extras for the number of people and dates specified. If the flight and holiday are not available the travel representative will present other options which may be of interest to the client. For each holiday option the travel representative will calculate the price. The travel representative will present optional extras for trips, examples which include: additional tours, car hire, upgrade of flight class, upgrade of hotel room class, rail trips and cruises and others.

The travel representative is highly trained and they are very focused on customer service. Clients can visit the travel representative as frequently as they wish to browse and query travel offers.

Booking a Holiday

Bookings are initially taken over the phone or in person. The booking agent usually requests that clients who have booked by phone make a visit to the travel agency so that they can plan the trip face-to-face. When a client decides to proceed with the booking of a holiday they will provide their personal details such as name, address, date of birth, contact number, dietary restrictions and email address to the travel representative who will record same in the booking order, the client signs the booking form to confirm the order. The client can book travel insurance for their holiday, as this service is provided by the company. The travel representative will provide details

based on the holiday destination for any special requirements, for example, visa requirements, recommended inoculations, additional sports equipment. For far-flung travel, the travel representatives will refer clients to a tropical medical clinic for more detailed medical advice and preparation of a client tailored immunisation programme. The travel representative will issue the client with a detailed receipt documenting all aspects of the holiday booked; this is of particular importance if the client has booked a tour. The clients are requested to pay a 15% deposit with the remainder to be paid six weeks before commencement of the holiday. When the client has paid the holiday cost in full they are issued with their travel documents. The travel agency will replace any mislaid tickets prior to the holiday date.

Customer Service

The travel representatives are available for any information requests that the client may have. Each travel representative can speak three languages and they can be assigned to clients based on language preferences.

Changing a Holiday

Clients can add extra persons and additional services six weeks prior to the holiday departure date. The travel representative will recalculate the price and issue the client with an invoice. All monies must be paid six weeks prior to the holiday departure date. Clients can reduce the number of persons on the trip and they will be refunded accordingly. However, if they perform this action within six weeks of the trip they will lose 30% of the individuals holiday cost.

Holiday Cancellation

The client has the option of cancelling their booking no later than six weeks prior to trip departure. Non-compliance with this rule will result in non-refund of the client's payment. However, clients can make an application that due to special circumstances they were unable to participate in the holiday e.g. illness. TravelLite Ltd., reviews all such applications and TravelLite Ltd., travel agency manager will make a recommendation on whether monies will be fully or partially refunded.

Holiday Evaluation

TravelLite Ltd. is very interested in customer trip experiences. They always request that clients complete a questionnaire which identifies their enjoyment of different aspects of the holiday. Clients who complete the questionnaire are entered into an annual holiday draw.

III. Class Identification for Choosing a Holiday

STAGE 1

Identify candidate classes by picking all nouns and noun phrases out of requirements specification document;

NOUNS AND NOUN PHRASES IDENTIFIED

Clients	magazine content	Dates
TravelLite Ltd Magazine	Continents	holiday option
Holiday	Travel agency manager	Trips
Flights	travel representative	Examples
Accommodation	holiday package	additional tours
Specialist tours	holiday code	car hire
Information	holiday dates	Flight class
flight-only options	Number of Persons	Hotel room class
Round the world trip ticket	Other options	Rail trips
Price	flight code	Cruises
Costs	Extras	Customer service
Months	Number of People	Travel offers

STAGE 2

Discard inappropriate candidates

Is it-

- Redundant
- Vague
- Meta-language
- Outside the scope of the system
- An attribute
- An operation

Clients - class

TravelLite Ltd Magazine - class

Holiday – Out of the scope of the system

Flights – attribute of TravelLight Ltd Magazine

Accommodation - attribute of TravelLite Ltd Magazine

Specialist tours – attribute of TravelLite Ltd Magazine

Information – Meta-language

flight-only options – attribute of TravelLite Ltd Magazine

Round the world trip ticket – Outside the scope of the system

Price – Meta-language

Costs – Meta-language

Months - Vague

magazine content – attribute of TravelLite Ltd Magazine

Continents - Vague

Travel agency manager – class

travel representative - class
 holiday package – class
 holiday code – attribute of holiday package
 holiday dates – attribute of holiday package
 Number of Persons – attribute of holiday package
 Other options - vague
 flight code – attribute of holiday package
 Extras – Meta-language
 Number of People - redundant
 Dates – vague
 holiday option - class
 Trips – attribute of holiday option
 Examples - vague
 additional tours – attribute of holiday option
 car hire – attribute of holiday option
 Flight class – attribute of holiday option
 Hotel room class - attribute of holiday option
 Rail trips – attribute of holiday option
 Cruises – attribute of holiday options
 Customer service – attribute of travel representative
 Travel offers – attribute of travel representative



IV. Class Identification for Booking a Holiday

STAGE 1

Identify candidate classes by picking all nouns and noun phrases out of requirements specification document;

NOUNS AND NOUN PHRASES IDENTIFIED

Bookings	Email address	Travel
Phone	Booking order	Clinic
Person	Booking form	Advice
Booking agent	Order	Immunization programme
Travel agency	Travel insurance	Detailed receipt
Trip	Service	Deposit
Booking of a holiday	Company	Remainder
Personal details	Details	Weeks
Name	Holiday destination	Holiday cost
Address	Special requirements	Travel documents
Date of birth	Visa requirements	Travel agency
Contact number	Inoculations	Tickets
Dietary restrictions	Sports equipment	

STAGE 2

Discard inappropriate candidates

Is it-

- Redundant
- Vague
- Meta-language
- Outside the scope of the system
- An attribute
- An operation

Bookings – class

Phone - vague

Person - vague

Booking agent – attribute of travel representative

Travel agency – outside the scope of the system

Trip - vague

Booking of a holiday – an operation

Personal details – attribute of clients

Name – attribute of clients

Address – attribute of clients

Date of birth – attribute of clients

Contact number – attribute of clients

Dietary restrictions – attribute of clients

Email address – attribute of clients

Booking order – attribute of bookings

Booking form – attribute of bookings

Order - redundant

Travel insurance – attribute of clients

Service - vague

Company - vague

Details - vague

Holiday destination – attribute of holiday package

Special requirements - class

Visa requirements – attribute of special requirements

Inoculations – attribute of special requirements

Sports equipment – attribute of special requirements

Travel - vague

Clinic – attribute of special requirements

Advice - vague

Immunization programme – attribute special requirements

Detailed receipt – attribute of bookings

Deposit - vague

Remainder – Meta-language

Weeks - vague

Holiday cost – attribute of holiday package

Travel documents – vague

Travel agency - redundant

Tickets – vague



V. Class Identification for Customer Service

STAGE 1

Identify candidate classes by picking all nouns and noun phrases out of requirements specification document;

NOUNS AND NOUN PHRASES IDENTIFIED

Travel representative	Clients	Language preferences
Information	Languages	

STAGE 2

Discard inappropriate candidates

Is it-

- Redundant
- Vague
- Meta-language
- Outside the scope of the system
- An attribute
- An operation

Travel representative – already in use, redundant

Information – vague

Clients – already in use, redundant

Languages – vague

Language preferences – vague



VI. Class Identification for Changing a Holiday

STAGE 1

Identify candidate classes by picking all nouns and noun phrases out of requirements specification document;

NOUNS AND NOUN PHRASES IDENTIFIED

Clients	Holiday departure date	Monies
Persons	Travel representative	Number of persons
Services	Price	Trip
Weeks	Invoice	Holiday cost

STAGE 2

Discard inappropriate candidates

Is it-

- Redundant
- Vague
- Meta-language
- Outside the scope of the system
- An attribute
- An operation

Clients – already in use, redundant

Persons – vague

Holiday departure date – same as holiday dates

Travel representative – already in use, redundant

Price – vague

Invoice – Meta-language

Monies – Meta-language

Weeks – vague

Trip – vague

Holiday cost – same as costs



VII. Class Identification for Holiday Cancellation

STAGE 1

Identify candidate classes by picking all nouns and noun phrases out of requirements specification document;

NOUNS AND NOUN PHRASES IDENTIFIED

Client	Rule	TravelLite Ltd
Option	Client's payment	Travel agency manager
Booking	Application	Recommendation
Six weeks	Circumstances	Monies
Trip departure	Illness	

STAGE 2

Discard inappropriate candidates

Is it-

- Redundant

- Vague
- Meta-language
- Outside the scope of the system
- An attribute
- An operation

Client – already in use, same as clients

Option – an operation

Booking – already in use, same a bookings

Six weeks – vague

Trip departure – vague

Rule – Meta-language

Client's payment – outside the scope of the system

Application – vague

Circumstances – Meta-language

Illness – vague

TravelLite Ltd – outside the scope of the system

Travel agency manager – already in use, class

Recommendation – vague

Monies – Meta-language



VIII. Class Identification for Holiday Evaluation

STAGE 1

Identify candidate classes by picking all nouns and noun phrases out of requirements specification document;

NOUNS AND NOUN PHRASES IDENTIFIED

TravelLite Ltd	Questionnaire	Annual holiday draw
Customer trip experiences	Enjoyment	
Clients	Aspects of the holiday	

STAGE 2

Discard inappropriate candidates

Is it-

- Redundant
- Vague
- Meta-language
- Outside the scope of the system
- An attribute
- An operation

TravelLite Ltd – outside the scope of the system

Customer trip experiences - vague

Clients – already in use, redundant
Questionnaire – vague
Enjoyment – Meta-language
Aspects of the holiday – vague
Annual holiday draw - vague



IX. Class Candidates

- Clients
- TravelLite Ltd Magazine
- Travel agency manager
- Travel representative
- Holiday package
- Holiday option
- Bookings
- Special requirements



X. Data Associated

Personal details – attribute of clients
Name – attribute of clients
Address – attribute of clients
Date of birth – attribute of clients
Contact number – attribute of clients
Dietary restrictions – attribute of clients
Email address – attribute of clients
Travel insurance – attribute of clients
Flights – attribute of TravelLight Ltd Magazine
Accommodation - attribute of TravelLite Ltd Magazine
Specialist tours - attribute of TravelLite Ltd Magazine
flight-only option – attribute of TravelLite Ltd Magazine
magazine content – attribute of TravelLite Ltd Magazine
Customer service – attribute of travel representative
Travel offers – attribute of travel representative
Booking agent – attribute of travel representative
holiday code – attribute of holiday package
holiday dates – attribute of holiday package
Holiday cost – attribute of holiday package
Holiday destination – attribute of holiday package
Number of Persons – attribute of holiday package
flight code – attribute of holiday package
Trips – attribute of holiday option
additional tours – attribute of holiday option
car hire – attribute of holiday option
Flight class – attribute of holiday option
Hotel room class - attribute of holiday option
Rail trips – attribute of holiday option
Cruises – attribute of holiday option
Booking order – attribute of bookings

Booking form – attribute of bookings
 Detailed receipt – attribute of bookings
 Visa requirements – attribute of special requirements
 Inoculations – attribute of special requirements
 Sports equipment – attribute of special requirements
 Immunization programme – attribute special requirements
 Clinic – attribute of special requirements



XI. Class Diagram 1

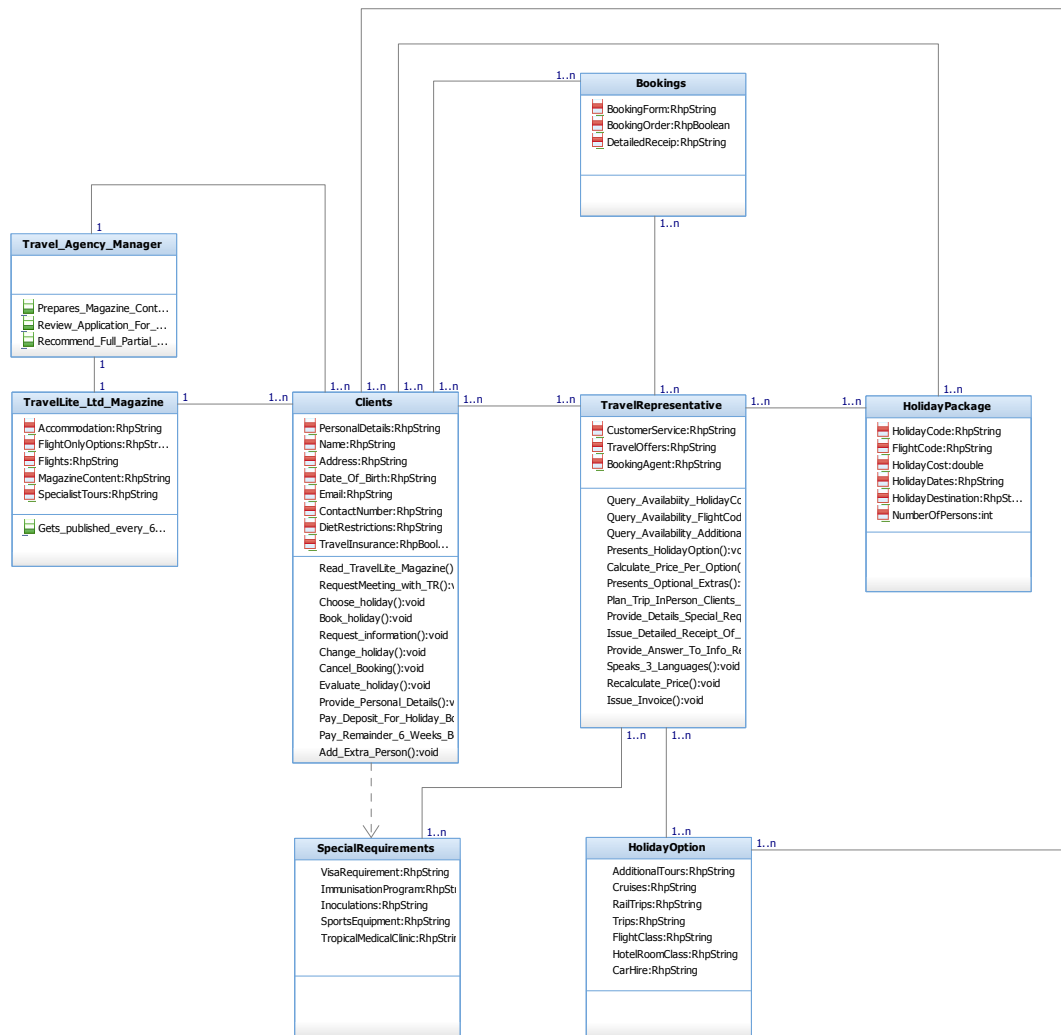


Fig. 1 Class diagram of existing system

XII. Booking Systems

Booking systems also called central reservation systems are the backbone of the leisure / hospitality industry. They represent major investment for any company embarking on winning the customer. From the perspective of the customers of Starwood Hotels and Resorts, the reservation system *is* the hotel (“Starwood Hotels and Resorts,” *Computer Honors Case Study*, 2010).

A common feature of booking systems is Content and Catalog Management software. It works with profiling tools that personalize the content of Web pages seen by individual users (Marakas, G and O’Brien, J., 2013). These computerised reservation systems combines back office, online booking (B2C) and partner booking (B2B) (Reservation System: <http://www.itravelsoftware.com>).

Booking systems are extremely vital in the operation of any major company in the hospitality industry. Upgrading any dilapidated existing system or replacing it totally presents a major challenge to any CIO and his team. As quoted in their book introduction to Information to Information Systems (Marakas, G and O’Brien, J., 2013), Keith Kelly, vice president, Information Technology at Starwood Hotels and Resorts says:

“Our websites are key points of interaction with our guests. If online services are unavailable or poorly performing, customer loyalty and profitability is quickly affected.”

Online intermediary companies too such as travelocity.com and expedia.com have been winning customers though their web based booking system. Potential customers do not need to leave the comforts of their homes when scouting for prospective holiday packages. All they need to do is log on to the internet and browse through these websites.

What used to be the traditional way of doing things, like contacting the travel representative, set up an appointment just to see what deals are on offer, is now a thing of the past, at least for some. A web based booking system has become the modern travel representative. Figures reveal that 70 percent of individuals and families who took a holiday in the last year booked entirely online (Stevens, J., 2012).

There are disadvantages to booking online. For example in the case of flight cancellations due to natural causes, customers were not notified on time. Despite of these reasons, web or online booking system is the present and future of booking travel activities.

Companies in the hospitality industry have all the reasons to incorporate web based booking systems in their operation. Through them, at least the major players have seen marked increase in customer bookings resulting to increased revenue.

XIII. Class Diagram 2

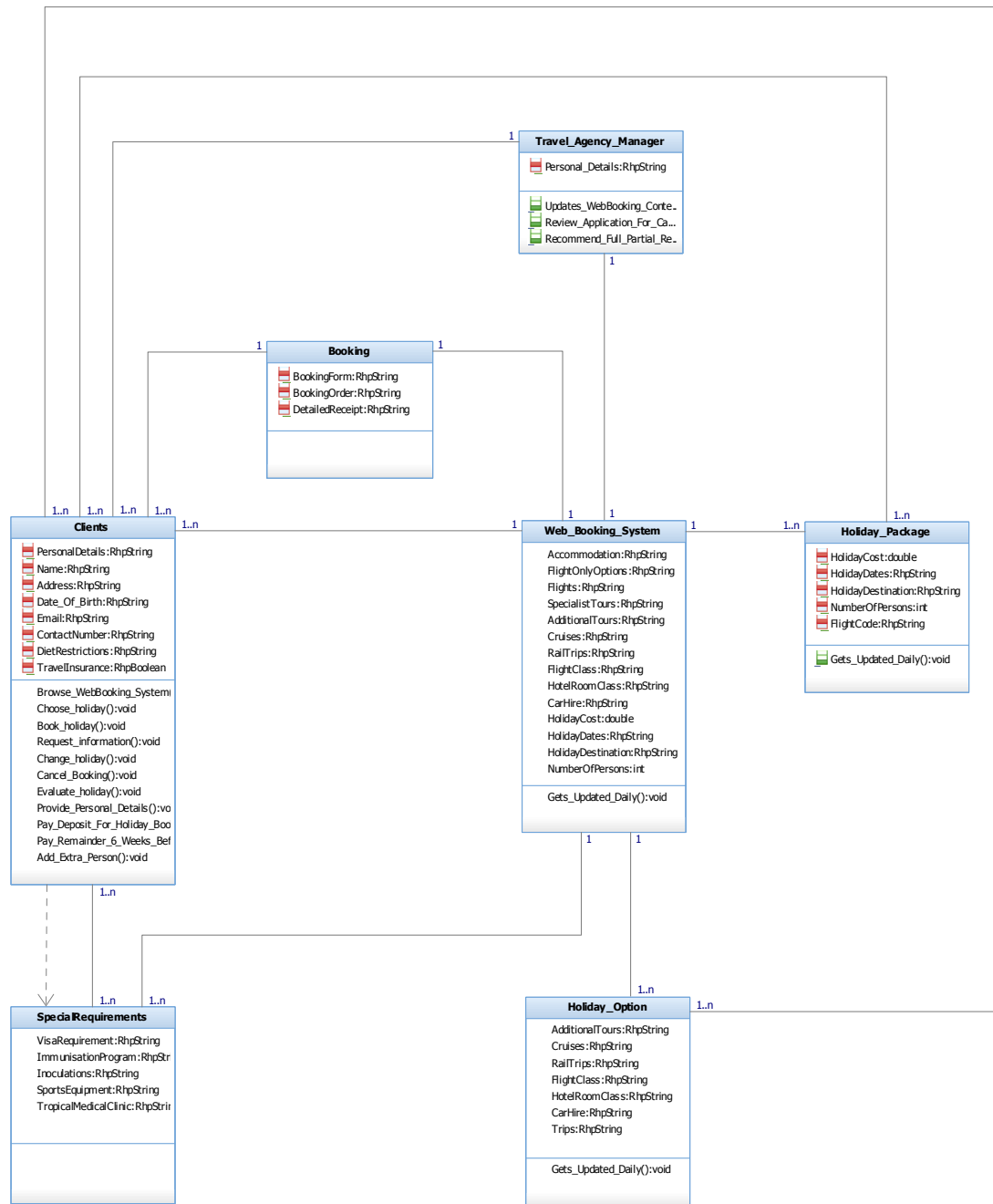


Fig. 2 Class diagram of new system

XIV. CRC Card

A CRC card for Clients Class

Class: Client/s	
Description: A client is a person who buys a holiday package from a company in the leisure and hospitality industry. The client class provides personal details when booking. Takes out insurance for protection against unseen events that may adversely affect him.	
Responsibilities	Collaborators
Browse web booking system Request for information Choose a holiday Book a holiday Provide personal details Change holiday Cancel booking Evaluate holiday Add extra person Make payments Get insured	Special Requirements/ Web Booking System

XV. Data Dictionary

A Data Dictionary for Client class

Class		
Client	Description(responsibilities): Details needed to book a holiday and buy insurance. To provide information for special requirements when travelling to a far-flung holiday destination.	
	Export Control (public: yes/no)	
	Relationships	Associations: Booking, Payment
		Aggregations: None
		Generalization: Person
	List of attributes and their primitive types:	Name: String, Address: String, DOB: String, email:String
	List of operations (include parameters and results):	BookHoliday(), PayDeposit(), RequestInfo()

XVI. Conclusion

By process of object-oriented analysis, one can visualize the booking system from the point of view those who will work with it. Classes were identified and organized into class diagrams for each of the initial use cases. This class representation provided an overall picture of activity in the existing system. It became apparent that the travel representative class was the focal point of contact in the system (see Fig. 1).

The research on booking systems provided the analysts a fresh perspective on how to improve the existing system. To automate the process, a web booking system class was introduced. This class then incorporated the magazine and its content. It also eliminated the travel representative class. The holiday package and holiday option classes remained and inherited some of the attributes and operations of the web booking system class (see Fig. 2).

One can see through this report the advantages of using object-oriented analysis. Objects constitute an actual person, place, event or transaction. This technique allows developers and analysts to envision a system from the perspective of those involved in the system. Objects have certain attributes which describe their characteristics. They also have operations or methods that they perform which can be highlighted by way of modelling.

It is hoped that this report has provided a fresh look on the increased popularity of Object-Oriented Analysis and Design. It incorporates design by modules and code that can be recycled. Hence can easily be combined and reconstituted into new components. This offers a significant potential for cost reduction and faster development times.

REFERENCES:

Marakas, G and O'Brien, J., (2013). *Introduction to Information Systems*, 16th ed., New York: McGraw-Hill/Irwin

Reservation System, [Online]. Available from:
<http://www.itravelsoftware.com/en/reservation-system.aspx> [Accessed: 24 November 2014].

Stevens, J., 2012, 'The end of the travel agent? Holiday booking services 'to become extinct' as people go to the web to buy their vacations' [Online]. Available from:
<http://www.dailymail.co.uk/news/article-2166772/The-end-travel-agent-Holiday-booking-services-extinct-people-web-buy-vacations.html#ixzz3K85FfVCU>
[Accessed: 25 November 2014].

Shelly, G., Cashman, T., and Rosenblatt, H., (2008) *Systems Analysis and Design*, 7th ed., USA: Thomson Course Technology

The Computerworld Honors Program, (2010). *Starwood Hotels and Resorts, Computer Honors Case Study*. [Online]. Available from:
<http://cwhonors.org/viewCaseStudy2010.asp?NominationID=267&Username=shrsos>
[Accessed: 24 November 2014].