

**FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism  
Management Students**

A Project Proposal

Presented to

The Faculty of STI COLLEGE of NOVALICHES



In Partial Fulfillment

Of the Requirements for the Degree of  
Bachelor of Science in Information Technology

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October 2019

**ADVISER'S RECOMMENDATION SHEET**

A Project Proposal Entitled

**FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism  
Management Students**

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And submitted in partial fulfillment of the requirements of the  
Bachelor of Science in Information Technology degree has been examined  
and is recommended for acceptance and approval

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A Project Proposal Entitled

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Management Students**

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**FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism  
Management Students**

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### **Abstract**

The proponents have innovated a one-of-a-kind first of its own descent system entitled “FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management” which aims to conceptualize new methods of memorizing airport codes with ease for the proponents’ fellow tourism students or users. With focus of learning in mind, the proponents developed it in a way that it is way more of an experience than just old method of boring time-inefficient memorizing.

## **Acknowledgements**

The proponents would like to extend their sincerest gratitude towards the respondents of the thesis surveys who have participated wholeheartedly by answering for the betterment of the study

The proponents also would like thank their thesis adviser, Mr. Jairo Robelle Pajarito, who in turn, is there to guide them throughout the thesis period and for providing an English proofreader to proofread the study's documentation / manuscript.

In addition, the proponents also would like to thank Mrs. Caress Simuangco for answering the questions in the interview honestly and also for providing the proponents a set of respondents a representation of a whole who in turn to be the system's stockholders.

Lastly, the proponents would like to thank their parents who have never been tired of providing financial and moral support for their children in order to achieve a common goal which is to end this thesis season with a high quality life-changing study.

## **Preface**

Correlating and conceptualizing ideas like airport codes and flight booking (simulations) and putting gamification techniques combined with the mobility of web and/or the internet augments a new innovative way for tourism students to memorize and consume airport codes.

The proponents then developed a system under the name “FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management Students” with ease of memorizing in mind. This system aims to help tourism students to have a new way to enjoy and better memorize IATA airport codes more effectively.



# **1 Introduction**

## **1.0 Introduction**

Have you ever wondered what happens to knowledge when not applied? It just fades away. Learning is doesn't end with one seating wherein you keep on memorizing and familiarizing a whole bunch of information that's not being used. Learning is acquiring knowledge but for most of us, memorizing and familiarizing such things don't quite end up well. Knowledge can be retained in a short period of time but susceptible to be forgotten sometime in the future because it is not applied (2019).

How about those things that require extensive amounts of time for acquiring knowledge? These can be resolved in a way unknowingly unexpected to many people. Conceptualization and Gamification comes into play. Conceptualization is an act of representing something towards another use case with different contexts and approaches (Gruber, 1993). This makes way to a holistic approach towards learning, which in turn, according to Gollub, Berthenthal, Labov, and Curtis (2002), is involved in successful learning as per research on cognition. On the other hand, to make memorization of codes be more of an interactive and interesting one, gamification is also applied. Gamification is applying game-design elements and game principles in non-game context (Hamari, 2012).

In relation to the proponent's metacognitive approach of tourism students on memorizing, familiarizing and/or acquiring airport codes, the ones that International Air Transport Association (IATA), the trade association for the world's airlines representing some 290 airlines and 82% of total air traffic, does provide, the proponents did a proposal in which it involves conceptualization of airport codes to be integrated in flight booking

simulation in order for these codes to be applied in a way that these tourism students are able to apply what they have learned in memorizing them and increasing knowledge retention permanence.

It is then materialized by using one of the world's mostly used technological platform, the web. In Layman's term, the system is hosted to be online and widely compatible with different devices whether it is opened on browsers on android phones, tablets, iOS devices like iPhones and iPads, PCs or Macs which promote portability and availability upon times when needed, unless the user doesn't have an internet connection (may be on cellular data or on Wi-Fi connection).

Basically, the site is based on how most of today's online booking systems work with just a bit of adjustments in order to achieve a quantifiably recognized learning towards airport codes and at the same time with how online booking works and seeing to it 100% credibility towards everything signed when booking a flight.

First, the user must go to the site through this link <https://fly-nova.com> or by searching "FlyNova" on search engines like Google, Bing, or DuckDuckGo, then once aware just by reading the front page, the user may then register in order to have his or her personal account to use on the site. Usernames and nicknames may differ based on the user's discretion. Once registered, the user is then provided with reviewers / a list of airports by country by continent in order to lessen the need to go to other sites to look for airport codes. The proponent's system provides 8,992 IATA airport codes which the user may have the choice which to memorize and which is needed for familiarize. Once done with the memorization phase, the user can then pick the difficulty of the booking to try. It can be easy, medium, or hard. Easy caters local-based flight which in turn the user can pick

what country the route and airport will from, for example, Philippines. The system then will provide airport codes and routes in the Philippines that the proponent's system caters like Manila to Bacolod (MNL – BCD), Kalibo, Aklan to Subic Bay (KLO - SFS) and others alike. Medium category caters cross-country continent-wide routes like Francis Bangoy International Airport in Davao (DVO) to Narita International Airport in Tokyo (NRT). Lastly, hard category caters cross-continent routes like Chiang Mai International Airport in Bangkok/Nonthaburi (DMK) to John F. Kennedy International Airport in New York (JFK). Once the user has chosen the booking simulation category, the system will generate a booking with an equivalent maximum xp (experience points) based on the difficulty of the booking made. Each booking session has a time limit of  $5 \pm 1$  minute to complete the session or else, the booking goes unfinished and will be scored based on what the user has finished filling up. Upon finish, the booking session will be scored based on the rightness of the booking simulation done if it resembles what is said on the provided instructions of the current booking simulation session provided by the system.

All done sessions will then be analyzed to make statistical details and be appended on user's statistics. These details will then be used to monitor if a certain achievement is achieved. Once a statistic goes equal or above said required quantity, only then an achievement will then be unlocked.

As the user keeps on playing, the user can then view the ranking in which one can identify at which position does the user's account is on, whether worldwide or by country.

## **1.1 Statement of the Problem**

Internet and the world wide web is not just a means of communications in today's view. It serves many purposes and targets specific types of people depending on the category and how the developers of a certain website or web applications implements them. Internet has grown big, it shows bigger potential and abilities that even more than 6 billion people may have not also consider doing yet.

FlyNova is a web-based flight booking simulation system that integrates airport codes in its system to shed light towards the one of the problems and struggles of tourism students which is the memorization and familiarization of airport codes.

Yes, the people do know, simulations are already a thing, although, as said, internet is becoming broad, having those that may be served still not served, one of which is flight booking simulations which then turns out to be one of the critical way of innovating new ways, conceptualizing and gamificationing memorization and familiarization of airport codes.

The proposed system will be able to make the memorization and familiarization process easier by pointing out the negative factor in doing so which is the attention time span and also the trait of it being a routine. Implementing usage of knowledge into newer context promotes higher probability of successful learning according to Gollub, Berthenthal, Labov, and Curtis (2002).



## **1.2 General Problem**

- **How to integrate IATA airport codes with flight booking simulation?**

- Memorizing IATA airport codes has never been easier. Tourism students, for most, do it the hard way, making a list of airport codes to memorize in a thin sheet of paper. After that, tourism students will memorize them in repetitions.

### **1.2.1 Specific Problem**

- **How to develop a module that will quantify airport codes acquisition?**

- Learning without thinking metacognitively may lead to repetitive execution of learning method, expecting better results yet turned out to be the same. In order to analyze how much airport codes a tourism student has acquired through the proponent's system, it needs to be quantified.

- **How to develop a module that will enhance attention span of users in applying memorized airport codes?**

- In every tourism student's mindset comes memorization, not only time-hogging, but also one of the duller moments in terms of being a student. The memorization process / familiarization of airport codes in this process must be implemented in a way that it is way more of an experience rather than a required routine.

- **How to develop a module that will simulate the flight booking process?**

- Flight booking process is one of the longest processes in terms of transaction management of websites. The proponents must come up with a way to implement these systems and incorporate it with the proponent's system.

### 1.3 Current State of Technology

In the tourism department of every school, a student struggles to memorize every airport code, airline code, country code and city code. For every category comes different set of codes to memorize. Airport codes refer to serving airport on the ground, some of which are, Ninoy Aquino International Airport / Manila International Aviation Administration (NAIA/MIAA) comes with the code MNL, Godofredo P. Ramos Airport (also known as Caticlan Airport) goes with code MPH. Airline codes refers to a certain flight server, for example, Cebu Pacific goes with 5J, PAL Express goes with PR, and Philippines AirAsia goes with Z2. Country codes are countries represented with two letters provided by ISO also known as International Organization for Standardization. Examples of these are Philippines as PH, Qatar as QA, Russian Federation as RU and list goes on (Simuangco, 2019). Tourism students makes a list containing the codes (whether what category based on what they are required to memorize) that the student's professor has given them. After the test that the student's professor has given, results vary. There are those who can perfect quizzes in relation to airport codes. It is possible to memorize most of the codes but first not all, and it may take too much time, experiencing difficulties on memorizing (Simuangco, 2019).

On the other side, simulations today successfully serve its purpose. Simulation is a close-to-exact replica or remake of a certain sets of instruction or compilation of entities (Nelson and Nicol, 2001). Simulation is used for most in video games, safety engineering, and education. Even though simulation games are a thing to many and also have been provided in different aspects like flight simulation (Flight Simulator X, YS Flight Simulator), business management (Cesim Firm, Virtonomics), surgeon simulation

(Surgeon Simulator 2013, Project Hospital), biology / bioscience (Plague Inc., simLeaf) and other fields alike, no one has attempted to make a simulation for flight booking and in turn with conceptualization of integrating airport codes to its mainstream gameplay.

## **1.4 Objectives**

Upon the researchers making the study, there are problems that arose needed to be shed with light in order to improve the current state of its technology. Henceforth, the title “FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management Students” is born. It generally aims to integrate IATA airport codes with flight booking simulation in which is better aimed when the proponents develop a module that will quantify airport codes acquisition, a module that will enhance the attention span of users in applying memorized airport codes, and a module that will simulate the flight booking process.

### **1.4.1 General Objective**

- **To integrate IATA airport codes with flight booking simulation**
  - The user or the student is now able to apply what is being learned in a more competitive, interactive and slightly more pressured way forcing learning to be integrated as a major part of flight booking. IATA airport codes will be integrated towards the flight booking simulation by having the proponents introduce a slight change in the flight booking process. The user or the student must type the IATA code rather than picking a place in a

dropdown or combo box in order to have the knowledge acquired be applied quickly after memorizing or familiarizing them.

#### **1.4.2 Specific Objectives**

- **To develop a module that will quantify airport codes acquisition**
  - The user integrates the concept of scoring through experience points (xp) that will be given to the user every flight booking session the user is going to make.
  
- **To develop a module that will enhance attention span of users in applying memorized airport codes**
  - The proponents include gamification features like achievements, statistics, and ranking to make it more of an exciting and competitive experience rather than of being a routine.
  
- **To develop a module that will simulate the flight booking process**
  - The proponents implemented that the simulated details to be inputted by the user in the system will be stored in Javascript Object Notations and will be repeatedly read and written in order to have a seamless, continuous flight booking process.

## 1.5 Scope

- **Cloud Hosting / VPS**

- With the site, having to be resource-hogging, specially when deployed due to heavy amounts of request whenever the users or the students are going to use the system, the proponents did consider hosting the web application / game in virtual private server or cloud hosting, at DigitalOcean Singapore to be specific.

- **User Accounts**

- In order to achieve one's own progress be saved and have one's own identity playing a niche in its environment, one is required to have an account registered and logged in before being able to play with the system.

- **Responsive**

- As of today's ever growing usage of smartphones over computers, portability wise, the proponents did consider to have a layout that is compatible in smartphones, tablets, iPhones, iPads, PC or Mac in order for the user to be able to play despite any device one is using.

- **Achievements Module**

- As one of game-design elements, the system includes achievements. Achievements will further enhance the gameplay making able for the user to visually track if something is achieved or acquired.

- **Booking History Tracker**

- In order for the user to track down one's past bookings, the system does cater having a visual and more eye-appealing way of showing the bookings to the user.

- **Carrier Seat Layout Simulation**

- A flight booking simulation would not be complete without the simulation of seats of carriers. The proponents did choose to only cater three layouts of aircrafts as of the moment in order to visualize the process of choosing seats for simulated passengers. These includes Airbus 330-300, Airbus 320, and Boeing 737-800 (737NG).

- **Credit Cards Simulation**

- As every to every flight booking session, payment plays a big part. To approach the payment module of the flight booking simulation, the proponent does integrate inputting of credit cards with detections whether the credit card is Discover, Visa, Mastercard or American Express.<sup>1</sup>

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<sup>1</sup> Credit cards' sixteen digit numbers, expiry dates and security codes / CVVs generated and saved here for the users' reference are all randomly generated and is not linked with any of today's valid credit cards. If there may come some instance that matches, please do note that it is completely unintentional and coincidental.

- **Worldwide Airport and Military Base Runway Codes**

- Upon research of the IATA airport codes from different corners of the world, the source did also provide those of the military bases making way for the proponents to also consider those to be included in the system.

- **Ranking**

- As a game, competitive gameplay plays a big part in one's gaming experience. In order to achieve and promote competitiveness in learning with the system's community, ranking modules is then implemented.

- **Statistics**

- One way to quantify this flight booking simulation experience, the system also provides statistical data of its users in order to track down how much and how the users or the students uses the system to learn those airport codes.

- **Notifications**

- Dynamic notifications are implemented to show message to a user without obscuring the user's current main activity yet able to deliver the needed information. Information includes levelling up, achieving or acquiring an achievements.

- **Instruction Generation**

- Dynamic notifications are implemented to show message to a user without obscuring the user's current main activity yet able to deliver the needed information. Information includes levelling up, achieving or acquiring an achievements.



- **Simulation Details Generation**

- Every action made by the user in a certain flight booking simulation is recorded or written in a Javascript Object Notation which is to be matched upon finish with the instruction set also integrated in the simulation.

- **Reciept Generation**

- Every flight booking needs a reciept where in the user knows how much one is about to pay. Same mechanism is applied in a module in the system.

- **JSON Matching Module**

- In order to check every details critical in flight booking simulation's credibility, certain algorithms with database CRUD operations and JSON reading and writing modules are implemented.

- **Specialized ErrorDocuments**

- ErrorDocuments are handled in a very unique way. There may be users or students that are to open a non-present links to the site. With that, the proponents did implement a unique way to get out of error 404 status.

## 1.6 Limitation

- **Third Party Payments / Payment Methods**

- As airlines tend to include third party payment APIs in order to promote wide variety of choice in one's payment preference, the proponents find it not operation-critical towards the imitation of the flight booking process as to serve this current purpose.

- **Other Airport Services**

- In addition to third party payments, the airlines also offer hotel booking, food (explicitly implemented with additional charges), special place for surfboards in the aircraft and other things alike. Same as with the first one, the proponents doesn't find this critical in the learning airport codes process to be implemented in this flight booking simulation processes.

- **Admin Side**

- Even though it is web-based, there are modules in the site that at the moment cannot be automated or done by the admin side (if made) like the animations to be provided whenever there is a new continent or country to be inputted in the system. Given the timespan of the thesis season, the proponents, didn't consider including the admin side for the mean time, also with its massive scope.

- **ICAO (Air Traffic Control purposed codes)**

- The system doesn't cater ICAO codes which is used at most at air traffic control towers, relaying directions messages in different frequencies.

- **Country and City Codes**

- The system also will not include integration of the country and city codes.

- **Cross-platform**

- The system is designed specifically in the web platform. With its responsive nature, it is then compatible with different devices as long as the proponent-proposed minimum device specifications are met. Making way for the system not needing to provide cross-platform implementations of the system.

## **2 Theoretical Framework**

### **2.1 Introduction**

In project management, every project needs correlation of different paradigms and practices in order to come up with a centralized work ethics towards how one team permeates the team goal. In this chapter the proponents will lay down all the paradigms and practices that are being used to approach the system with quality, efficiency, speed and greater frequency in mind.

### **2.2 Agile Software Development**

Agile is an approach for developing products using short iteration. The main idea is not making the whole project from start to finish but making small features for the current project in a small period of time. This way the result of each iteration are used to adjust the project plan. Its requirements and solutions evolve through the collaborative effort of self-organizing and cross-function teams and end users.

#### **2.2.1 V-Model**

- Same as with waterfall model however is organized in a way where in the last steps are bent upwards after the coding phase to form a V-shape showing each phase' relationship. Horizontal axes represents time while the vertical axes represents the level of abstraction.

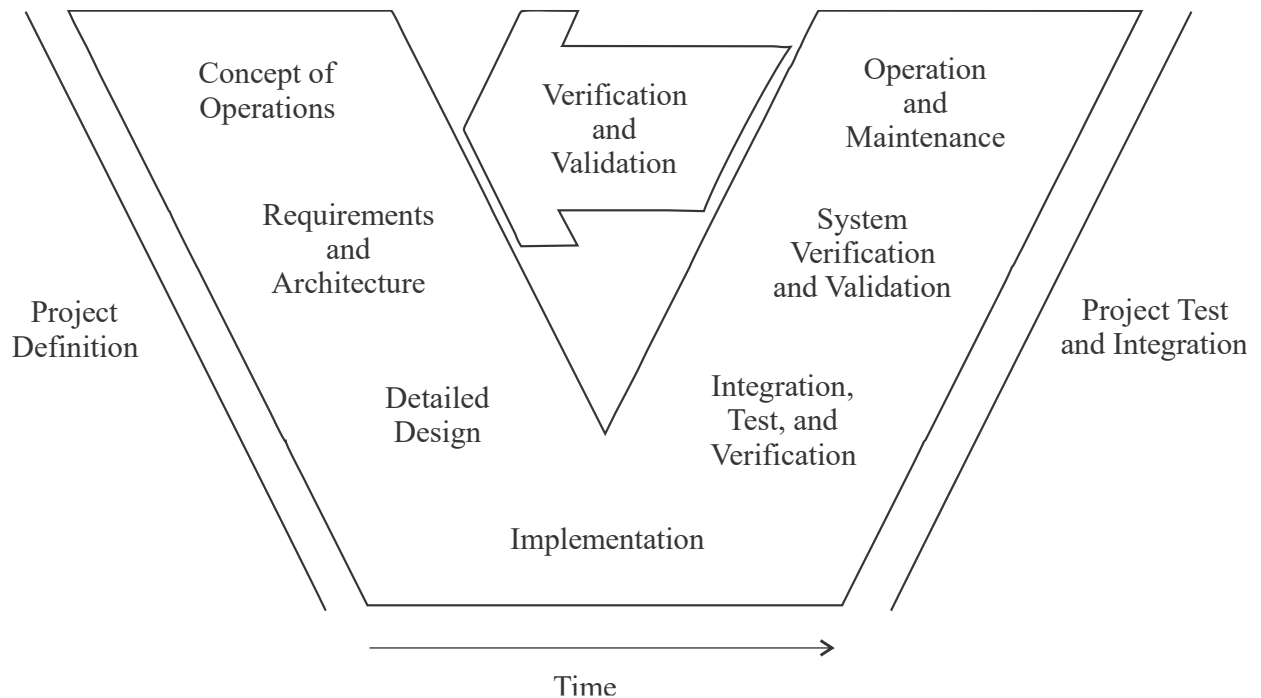


Figure 2.2.1 V-Model of Systems Engineering Process

- Concept of Operations

In this process, the proponents did conceptualize the operations critical in system operation. It is identified as modules.

- Requirements and Architecture

Before every module is designed and implemented in the system, the proponents identifies the dependencies such modules requires in the system. Here, the proponents make sure that the dependencies are in good condition so that when the proponents decide to enter the designing stage and

implementation, lesser to none exceptions and errors can be expected.

- Detailed Design

Here, the modules are specified to the most little details. The proponents does provide the specific algorithm to follow in order to implement the module.

- Implementation

The designed module is then put to code to implement.

- Integration, Test, and Verification

The implemented module is then put into integration wherein in this phase, the said module is finally going to use its dependencies and will be verified if it works properly before the proponents allow it to produce outputs.

- System Verification and Validation

In this phase, the proponents deeply checks and confirm that the integrated modules is being accepted properly by the system. If it does, the system does not introduce operational and data errors that may affect the core processes of the system.

- Operation and Maintenance

In this phase of the V-Model, the proponents chose to make the module act with freedom based on how it is

algorithmed. It may now then produce outputs for the proponent can now acclaim that it will not affect the main core function and processes of the site. However, there is no perfect system, in this phase, the module may still be susceptible to small bugs, that's why, here, it is subject to last maintenances.

- **Verification and Validation**

As for the last phase of module development here in the V-Model, the proponents can now assure that it works well, declaring that it will a be high quality module that can be released in the production. Once that is done, the next module is then prepared to start a new V-Model while the current module is still in parallel to further make it more of a higher quality module.

## **2.3 Practices**

### **2.3.1 Extreme Programming**

Closely focusing towards the software improvability and responsiveness towards customer requirements, it promotes frequent releases in short cycles to promote productivity and take a view of more checkpoints where new requirements can be introduced.

### **2.3.2 Adaptive Software Development**

It makes the proponents think of it that continuous adaptation of diverse processes to the current module is just normal.

### **2.3.3 DevOps**

Critical practice for setting up the remote servers at Singapore while developing at system at hand, DevOps combin software development and information-technology operations to purposefully shorten software life cycles while incorporating smooth continuous delivery without compromising software quality.

### **2.3.4 Behavior-driven Development**

In this practice, the proponents chose to collaborate with non-technical people involved in the system while introducing them with a non-technical approach in order to test the system with full understanding and provide feedbacks without the need in technical jargons and knowledge.

### **2.3.5 Continuous Delivery (CD or CDE)**

In relation to the proponents chosen software development paradigm, the proponents chose to produce the system in a bit smaller modules at great speeds to come up with releases and product movement with more frequency without compromising adjustments made to the system.



## **2.4 Database**

Database primarily stores the data. It plays a big role in storing one of the core components of the system, the data. It acts more as a non-volatile storage for the resources that require reuse all of the time. In this instance, the proponents chose MySQL as its database platform.

## **2.5 Cloud Hosting / Virtual Private Server**

As the system grows in demanding resources like CPU usage, memory and non-volatile storage, the proponents used cloud hosting with virtual private servers over web hosting for it to cater its massive resource-hogging algorithms and technical mechanisms. For this, the proponents considered using DigitalOcean Inc.'s Singapore servers to achieve high performance and speed, having that the location is in Singapore, it might as well serve the Philippine's as its primary source of clients with unmetered and fast delivery speeds.

## **2.6 Summary**

As to this chapter, the paradigms, models, methodologies, resources and frameworks are further elaborated in order to clearly understand more what is being needed to come up with a system that is state-of-the-art first of its own descent.

Upon the system development throughout the thesis period, the system is then delivered with high quality at high speeds and more frequently. The lesser conflicts have arose by following the stated frameworks above.

### **3 FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management Students**

#### **3.1 Introduction**

As of today's fast paced technology, web or widely known as the Internet keeps at its pace on growing as world's largest platform. With its endless capabilities, there are some that is still not discovered.

Same as with learning, even though it is said that learning and memorizing success is better achieved by incorporating concepts to concepts, there are least to none provided conceptualization and other methods of learning airport codes.

The proponents then made a system entitled “, FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management Students, ”to give a helping hand to the proponents’ fellow tourism students studying airport codes across the nation and outside the country. Its is made to integrate the application of airport codes in the flight booking process combined with the concept of gamification in order to make a new experience in learning, memorizing and applying airport codes in the users’ or students’ daily lives.

The system will enable the students to make flight booking simulations where there is a small twist in the choosing of departure place and arrival place. The students are going to input the corresponding IATA codes of the place given in the instructions, failing to do so will either proceed to a deadend where in FlyNova is not able to provide schedules and just end the booking session or else continues but will have diminished points.

## **3.2 System Design and Specification**

### **3.2.1 Front-end**

- **Registration**

This page enables the students or users to register to the system to obtain a free account to be used if they did not have an account yet.

- **Login**

This page is where those who already have accounts can log in and use their account on the system.

- **Homepage**

This page is where everyone can be able to know what does the system contain and make the user more aware of what can be found within the system.

- **Dashboard**

This page serves as the site's / system's central access for the site's critical features like the reviewers, categories of simulation, achievements, rankings and other essentials shortcuts, served with animated visuals for the non-mobile layout and static carousel for mobile layout. The mobile layout is focused to load first in order to prioritize its loading times.

- **Reviewers**

The reviewers contains the lists of airport codes the student can memorize and familiarize based on their discretion.

- Ranking

This page contains the top players / simulators / students / users who played in the system. The system provides global ranking, country-based ranking and ranking based on colleagues. The system also provides a separate sheet that shows the position of currently logged in user in accompany with two users greater and two users lower than his ranking.

- Profile

The profile page shows one's achieved achievements, current statistics, colleagues who accepted one's relationship request(s) and lastly, most recent bookings one has made in the past.

- Achievements

This page contains the achievements one has achieved and also the ones that one can achieved or not achieved yet as of the moment.

- About Us Page

The about page contains the details of the system, mission and vision and also the ones behind the development and materialization of the system.

- Privacy Policy

As the system collects important and required personal information, this page contains what the users can expect in the way the proponents handle their personal data.

- Terms and Agreements

This page contains what the user or the students agrees with the proponents in using the system.

- Contact Us Page

This page contains the contact method in which the proponents are being able to be reached by the users or students.

- Frequently Asked Questions

To lessen the time needed to answer the concern of some of the site's users, the proponents did prepare FAQs in order to cater most of people's asked questions.

- Notifications

Notifications are shown in the event that there is something important for the user to be known or be aware of while not obstructing one's focus on site.

- Error-Handling Documents

To lessen the user's concern towards error pages, the proponents did prepare unique implementation of error documents in order for the user to get back on track without experiencing too much worrying.

- Colleague Page

This page is the same as the profile; however, it is loaded with a different profile where the currently logged in user can either,

request a colleague relationship, delete one's request or approve one's request.

### 3.2.2 Back-end

- Instruction Generation

In every instantiation of every simulation session, instruction are generated and laid out in a JSON string and is saved in a field in a session record in order to be used through out the booking session.

- Simulation Generation

Every actions made by the user, either the instruction is followed or not, will be recorded in a separate JSON file which in the end will be compared to the instructions in order for the system to be able to provide quantification of learning.

- Reciept Generation

Reciepts will be based on the booking of the user. Whether one has followed the instruction or not, as long as the flight made by the user is also available in the *situatuational\_flights* table, a receipt with computations based on the algorithms the proponents made will be generated.

- JSON Combination Checking

In order to obtain a set of correct simulations and quantified results, booking simulations and instructions in the current booking session is being combined and compared to validate which one is

followed correctly and on the other hand, what is not and diminished from the total pre-granted XP points.

- XP Provider

This module focuses providing XP (experience points) accordingly based on the user's performance for the current session.

- Time Calculator

As flight departure times are already provided, the system provides a set of flight arrival times for specific routes on the spot upon being needed. It calculates the times by making it default if a route is less than 930 kms (500 knots), the route will automatically have 30 minutes as flight duration. On the other hand, if a route exceeds 930 kms, if there is a remainder that exceeds 5, the system will add 30 minutes on the duration, while the whole number generated by dividing the total distance with the default distance will serve as hours. 930 kms is preferred as default (FlightDeckFriend, 2019).

- Ranking Generator

In order to introduce competency towards colleagues, in the current country of the users / student, and globally, ranking feature is included. The backend feature work by gather top 5 among different categories: globally, by country and colleagues. In order to also provide focus towards the current user's performance, the proponents did include an algorithm where in it tracks down the user

among the rankings and get two accounts above and below his rank and show it in the front end.

- Statistics Tracker

As this thesis is focused on quantifying learning of airport codes, statistics play an important role in the gameplay of users. As to implement statistics, every booking session is tracked down in order to generate needed statistics in tracking down user's progress in learning and memorizing airport codes.

- Achievement Tracker

As to conceptualizing gamification in the application and integration of airport codes in flight booking, achievements back-end module is introduced. Achievements is implemented by monitoring statistical data provided by the statistics module every booking session made in the backend.

- Notification Sender / Issuer

In order to provide or show the information needed by the user without obstructing his current activity, the proponents included a notification issuer where in it is implemented dynamically. It shows notifications which can include different pictures, title, description and icons.

- Colleague Relationship Management

Colleagues' progress plays a big part in ones own progress. It boosts one's competitiveness to progress above one's own



colleagues. By this, the proponents does include one small feature of social networks which is colleagues. With this module, the ranking towards colleagues has been included and also managing colleagues is included.

### 3.3 Diagrams

To present these in a visual way, the proponents did prepare such necessary diagrams for more brief and concise understanding of the matter.

#### 3.3.1 Storyboarding

Under this, the proponents shows how or what the user might expect and go with the flow upon starting to use the system.

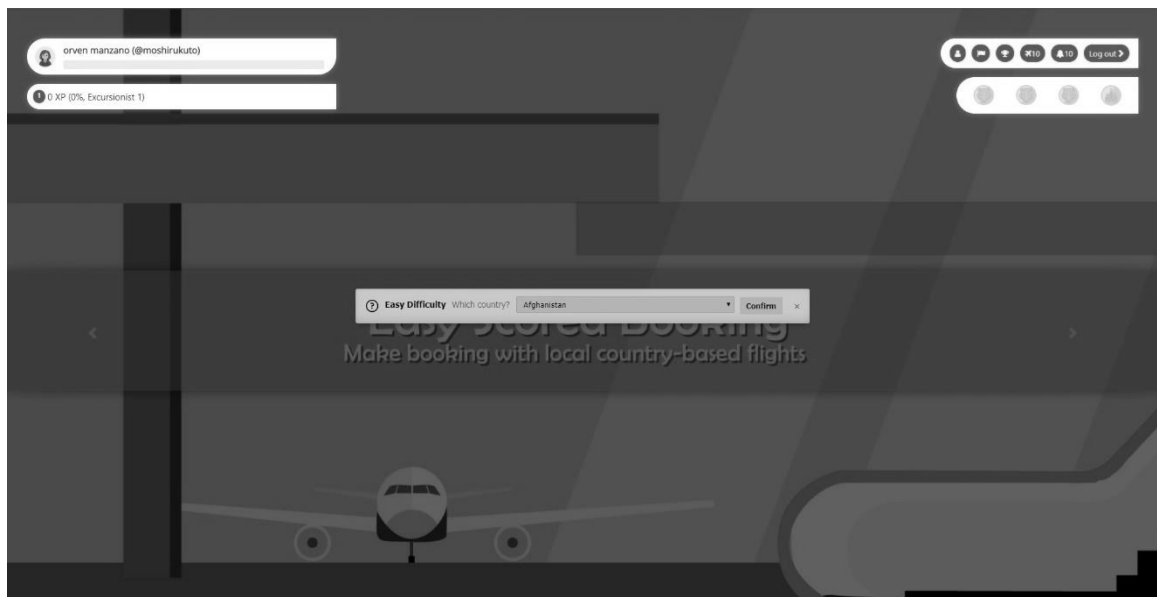


Figure 3.3.2.1 First Story – FlyNova Dashboard







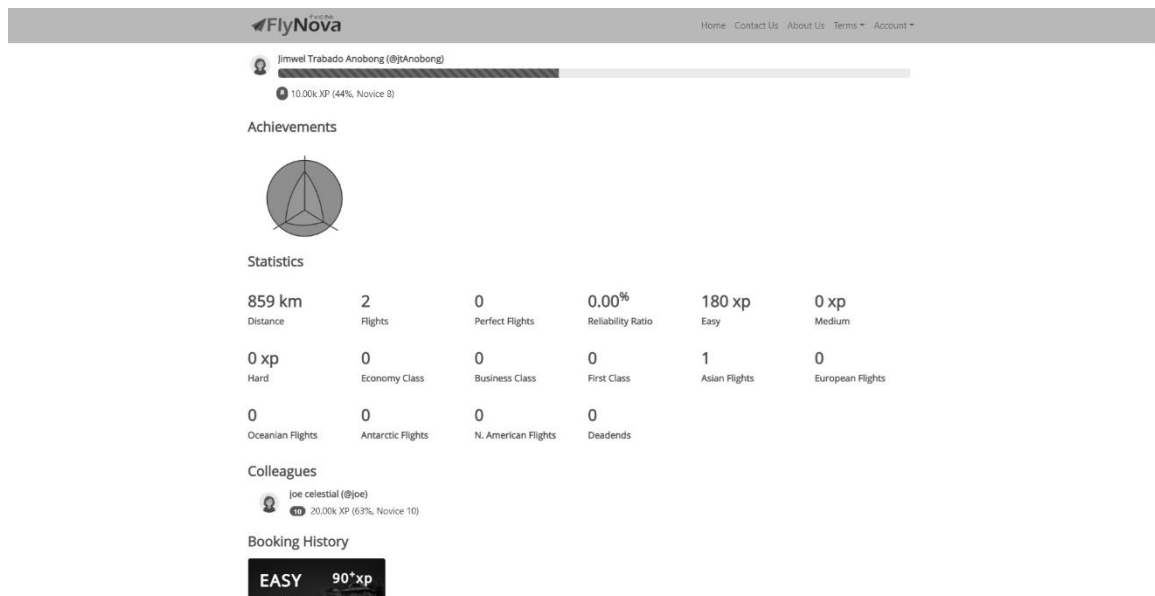


Figure 3.3.1.8 Eighth Story – Statistics, Colleagues and Booking History Viewing

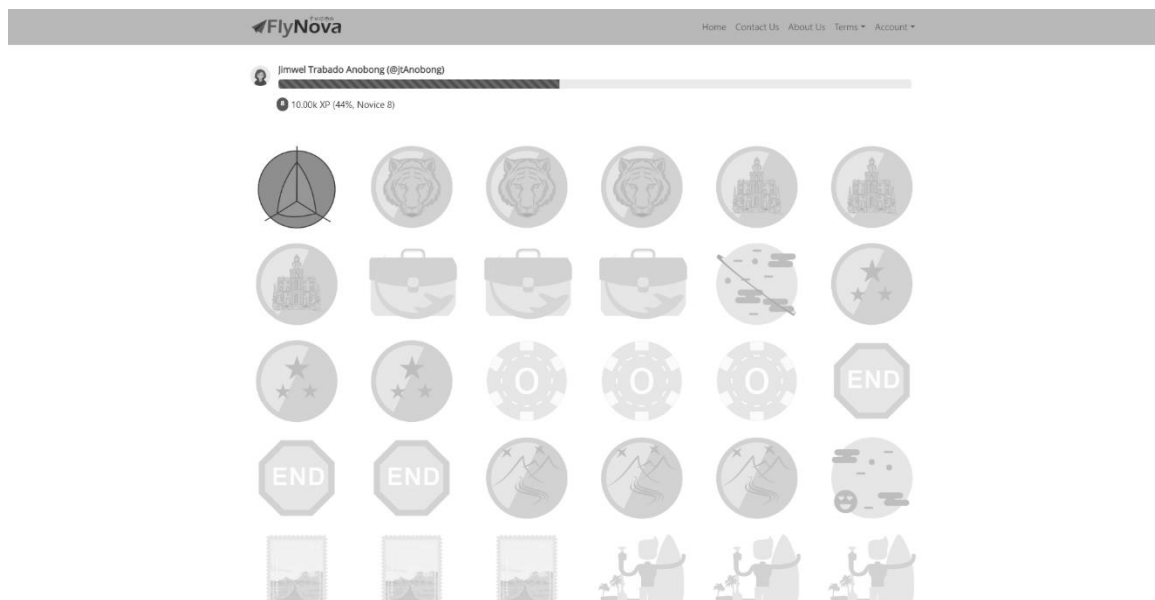


Figure 3.3.1.9 Ninth Story – Achievements Viewing

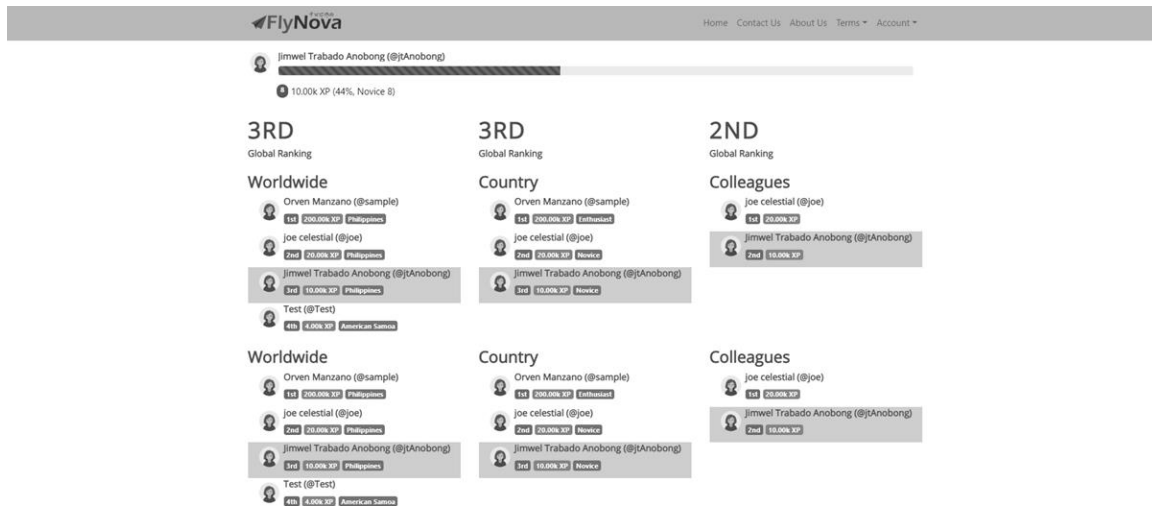


Figure 3.3.1.10 Tenth Story – Ranking Viewing

### 3.3.2 Entity Relationship Diagram (ERD)

ERD plays a big role in checking if a foreign key does exists or not making way for a lesser discrepancy in handling database data. It also made when one designs a new database schema or one is about to document one's current database structure.

Entity Relationship Diagram provides a visual of the relationships between the tables in a database. It helps in identification of those entities and their relationships.

## Entity Relationship Diagram

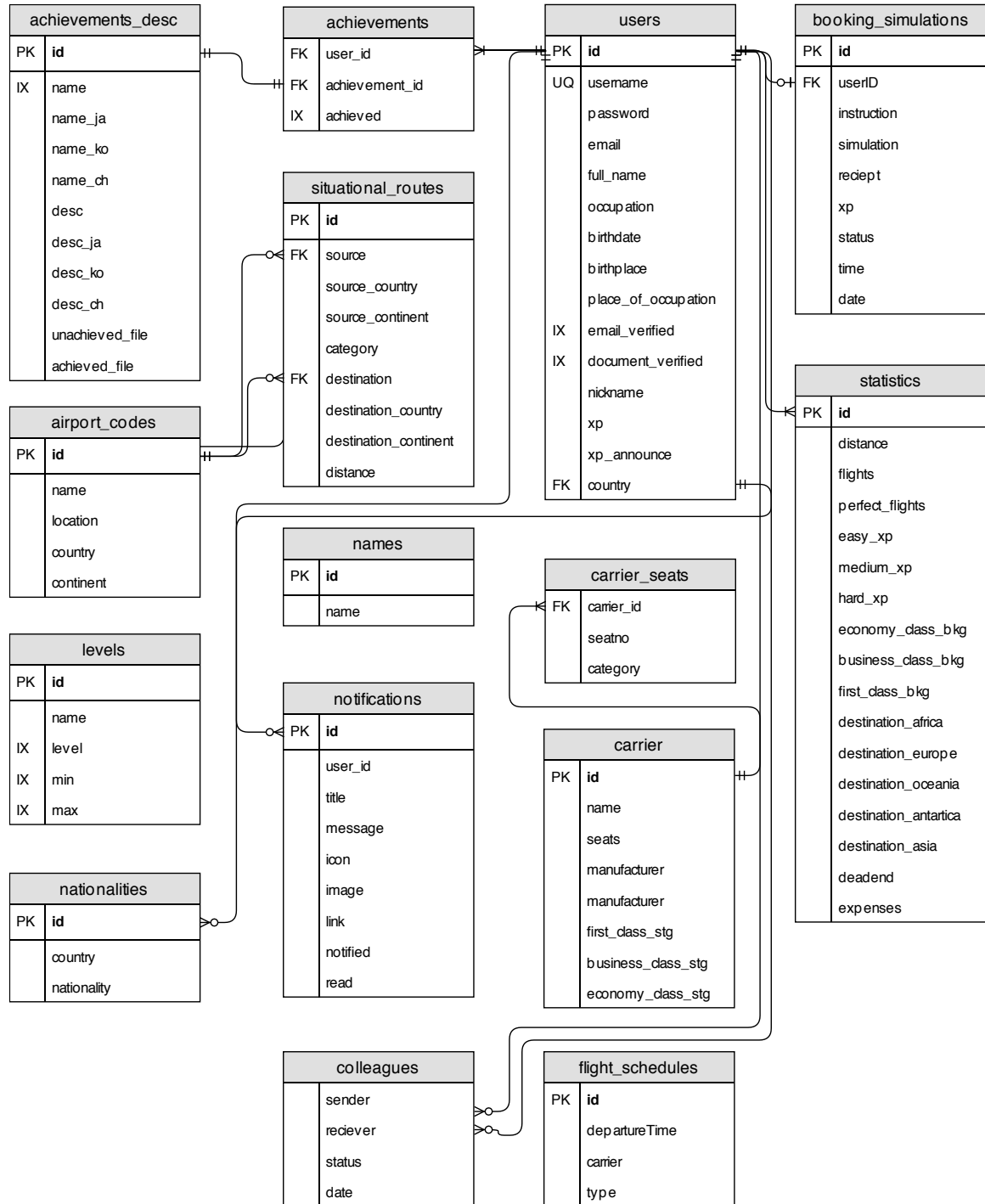


Figure 3.2.2.1 Entity Relationship Diagram

### 3.4 Resources

This covers the required hardware and software in developing the proposed system.

- **Hardware:**

- For the users:

- Mac, Desktops and Laptops

Minimum Requirements	Optimal Requirements
Intel® i3-540 Processor (4M Cache, 3.06 Ghz)  2GB DDR3 Ram  Nvidia GT 730 / AMD HD 5550  DSL Connection / Cellular Data	Intel® i3-6100 (3M Cache, 3.70 Ghz)  8GB DDR4 Ram  Nvidia GTX 560 / AMD Vega 11 (R5 2400G Integrated) / AMD 5850  and above  Fiber Connection

- iPhones and iPad

Minimum Requirements	Optimal Requirements
Apple A9 (1.8 Ghz, dual-core)  2 GB Ram  DSL / 4G / LTE Connection	Apple A10 Fusion (2.3 Ghz, quad-core) and above  2 GB Ram  Fiber / 4G / LTE Connection



- Smartphones and Tablets

Minimum Requirements	Optimal Requirements
Snapdragon 410 / Exynos 4412 / MT6589	Snapdragon 712 / Helio X30 / Exynos 8890 / Kirin 960 and above
3GB Memory (Android 5.1 with JIT Compiler)	4GB Memory (Android 5.1 with JIT Compiler) and above
Qualcomm Adreno 200 / ARM Mali-200	Qualcomm Adreno 304 / ARM Mali-T720 / Nvidia Geforce Tegra 4 and above

- For the proponents (while developing the proposed system)

- Local Server (DNS, File, Apache, MySQL, Filezilla, Mercury)
  - AMD Athlon™ II X2 250 Processor | 3.00 Ghz
  - 4.00 GB (3.50 GB usable)
  - 64-bit Operating System, x64-based processor
  - Windows Server 2019 Datacenter
  - 128 GB SSD (OS) | 2 TB (Network File Sharing)
- Local Development and Debugging Client PC
  - Manufactured by Gigabyte Technology Co., Ltd
  - H310M H2.0 (rev 1.0)
  - Intel® Core™ i3-9100F CPU | 3.60 Ghz
  - 16.0 GB DDR4 Memory

- 64-bit Operating System, x64-based processor
- Windows 10 Pro, Version 1903 (OS Build 18362.356)
- Nvidia GeForce GTX 1050 TI 4G
- 23.9” 1920 x 1080 Asus IPS Monitor
- 24” 1920 x 1080 Dell LCD Monitor
- Remote Laptop Test Bench and Project Presentation Device
  - Acer Aspire E5-575G
  - Intel® Core™ i3-6106U | 2.00 Ghz
  - 8.00 GB Ram (7.85 GB usable)
  - 64-bit Operating System, x64-based processor
  - Windows 10 Pro, Version 1903 (OS Build 18362.295)
  - Intel® HD Graphics 520 | Nvidia GeForce 940MX
- Remote Server (DigitalOcean Singapore)
  - Ubuntu 18.04.03 (Bionic Beaver) Server, phpMyAdmin Pack
  - Includes phpMyAdmin, MySQL Server, Apache, PHP, and Certbot
  - Droplet Name: flynova-server-x64
  - 2 GB Memory
  - 50 GB SSD Disk
  - Unmetered Access, 2TB File Exchange
  - 1 Virtual CPU
- Android Testing Device
  - Oppo A5s (CPH1909)
  - 6.2” HD+, 4230mAh Battery

- 3GB RAM | 32GB Internal Storage
- Color OS 5.2 based on Android 8.1 Oreo
- Mediatek MT6765 Helio P35 (12nm)
- Octa-core (4x2.3 Ghz Cortex-A53 | 1.8Ghz
- PowerVR GE8320
- iOS Testing Device
  - iPhone 6s (A1688)
  - iOS 13.2 (17B5068e)
  - 64 GB Capacity
  - Apple A9 (1.8 Ghz)
  - 2 GB Memory
- Software:
  - For the users:
    - Internet Browser
      - ✓ Recommended (Cross-platform): Google Chrome / Brave Browser  
/ Opera Browser / Opera GX Browser / Chromium Edge Dev/Beta
      - ❖ Note: Compatible with other browsers like Safari and Mozilla
      - ❖ Precaution: Use recommended browser for better experience. Safari may have the least desired experience due to Autoplay Blocking feature introduced with Safari on macOS High Sierra 10.13. macOS Mojave 10.14, macOS Catalina 10.15, iOS 12, iOS 13 and iPadOS 13.

- For the proponents:
  - Internet Browser
    - Brave Browser
      - Mainly used to try and preview coded PHP files
    - Database Management
      - Navicat Premium 12
        - Used to transfer table structure and data from one table or database in the local server to another table or database in the remote server.
      - JetBrains Datagrip
        - Another application to manage multiple connections to different databases at the same time.
    - Integrated Development Environment (IDE)
      - JetBrains PHPStorm
        - Used mainly for advanced editing, coding, and debugging PHP files.
      - Sublime Text 3 / Visual Studio Code
        - Offers the same capabilities as JetBrains PHPStorm with more support for different languages and offers them in a lighter environment.
    - Graphics Manipulation / Editing
      - Adobe Illustrator CC 2019

- For editing vector files needed to be animated in the dashboard page, and other essential visuals for the system.
- Adobe After Effects CC 2019
  - For compositing and animating done laid out vectors for a more entertaining experience towards the dashboard of the system.
- Adobe Media Encoder CC 2019
  - For encoding composited animations with H264 and HEVC encoding formats and exported as MP4 files.
- Adobe Audition CC 2019
  - For voice recording, dramatization of pilot(s) talking, adding more enhancement with the system's experience towards the users or the students.
- Coreldraw X5
  - For laying out icon vectors that need not to be animated and be used in a Portable Network Graphics (PNG) format.
- Project Management
  - Microsoft Teams
    - In the absence of financial aspects towards the project management of the proponents, Slack cannot be availed. As an effective alternative, the

proponents does use Microsoft Teams to promote focus towards development and documentation and exchange files and do communication without any other distractions.

- Office 365 Business

- Upon the development of the project by the proponents, the proponent's academe does provide licenses for Office 365 Business which enables them to use many of Microsoft's features like remote live collaboration on Word™ and Powerpoint™ Documents

- Office Essentials

- Microsoft Word 365 / 2019

- For proponents to make the proposal's documentation

- Microsoft Powerpoint 365 / 2019

- For proponents to be able to present it to users and/or students visually

- Microsoft Visio 2016

- For laying out diagrams

- Microsoft Access 2016

- For tallying surveys conducted by the proponents.

- Prototyping
  - Bootstrap Studio
    - Used by the proponents in order to make a predefined CSS layout with Bootstrap CSS framework integration.
- Random Text Generator
  - PWGen 2.9.0
    - Essential to be used by proponent whenever needed to provide unique primary key for a record without enabling the autogeneration feature of databases.
- Software Servers
  - Apache Server
    - Serves PHP to clients
  - MySQL / MariaDB Server
    - Hosts MySQL / MariaDB Databases
  - Filezilla Server
    - Enables transfer of files using File Transfer Protocol (FTP) at port 21 and Secure File Transfer Protocol (SFTP) with private and public keys at port 22.
- Operating Systems
  - Windows 10 Pro
    - For web development, to contain applications needed in development

- Windows Server 2019 Datacenter
  - To cater local development environment
- Ubuntu 16.04 (Bionic Beaver)
  - To cater remote server widely accessible to the public
- Command Line Applications
  - Certbot
    - Used to issue Secure Socket Layer (SSL) Certificate for the site for free
  - Nano
    - Used for editing files in the server with the use of command line.
  - SSH (Secure Shell)
    - Cryptographic protocol for operating network services securely. Used to tunnel through the remote production server with the use of command line.
  - Terminal
    - Executing actions needed in absence of graphic user interface.
  - Cron / Crontab
    - Used for setting up cron jobs that are expecting to run within intervals of periods of time. (Critical in the flight booking session timer feature)



- Operating System Features (Critical)
  - Windows Subsystems for Linux
    - In the absence of the Linux terminal commands and terminal itself, it is better to have native support of it in the Windows environment. WSL provides that.
- File Transfer (Protocol)
  - Filezilla Client
    - Widely used file transfer protocol software, used to exchange files with the server and client computer. Does delete files even used at cron jobs. It does operations without consideration whether files to be deleted is being used or not (except root files, of course).
  - Cyberduck
    - Same features as Filezilla's, however with a cleaner user interface.
- Languages:
 

The proponents used different programming languages in order to implement the proposal.

  - Markup Language
    - HTML (Hypertext Markup Language)

- Used to iterate the objects in the web page user interface as HTML elements based on the Extensible Markup Language format.
- Client-side Scripting Language
  - Javascript 6 / EcmaScript (JS)
    - Liable for the system's front end implementation of account notifications close to real-time gathering of needed information.
- Server-side Scripting Language
  - PHP Hypertext Processor (PHP)
    - Used to process JSON files in the server and also process database tables values without interference from the user / student. Executes other important tasks by complex algorithms in the server back-end.
- Stylesheet Language
  - Cascading Style Sheets (CSS)
    - Used for providing aesthetic value on the system's front end.
- Object Notation
  - Javascript Object Notation (JSON)
    - Used in storing important details in every booking sessions done in the system. Each booking session contains three object notations. First, the instruction set. Second, the simulation set. Last but not the least, contains the receipt.

- Extensible Markup Language(XML)
  - Not necessarily used in the core function of the site but is needed in the implementation of search engine optimization of the site from search engines. In other words, XML here is used for making the *sitemap.xml*.
- Frameworks:

The proponents used different programming frameworks essential in providing ease in implementing the proposal.

- Javascript (JS)
  - JQuery
    - Cleaner and shorter Javascript codes with the same implementation.
- Cascading Style Sheets (CSS)
  - Bootstrap 4.0 by Twitter
    - To provide easy in making the front end of the system
  - W3 CSS
    - Used for some components find it critical in design.
  - Font Awesome
    - Referencing icons from Font Awesome Library
  - Ionicons
    - Referencing icons from Ionicons Library
  - Animate CSS

- Used to animate HTML elements with the use of CSS
- Google Fonts
  - Used in order for the proponents to be able to integrate the “Open Sans” font from Google Fonts.
- IziToast CSS by Marcelo Dolza
  - Provides design backend for the notification-centered javascript plugin IziToast

- Plugins:

The proponents used different programming languages in order to implement the proposal.

- Javascript (JS)
  - IziToast JS v1.4.0 by Marcelo Dolza
    - IziToast has been specifically integrated by the proponents to the system for the purpose of serving the system notifications.

- Programming Concepts:

The proponents used different programming concepts as basis for the structure of the system of the proposal.

- Object Oriented Programming

- Programming structure chosen by the proponent in order to provide ease in providing the system feature updates when needed even though time costly at first implementation.
  - Asynchronous Javascript and XML (AJAX)
    - Used to update one part of the webpage without refreshing the whole page. Enables close to real-time updates to be provided on the site.
- Libraries:

The proponents used different programming libraries that handles error in the system.

- C Library
  - Perl Compatible Regular Expressions (PCRE)
    - Apache Directives
      - Used in rewriting rules in Apache server and redirecting error documents like error 404.

### 3.5 Summary

The proponents laid down the details about the design, specification, and requirements of the Flynova system. These details plays a critical role in providing the users and students awareness in the proper use and features the system provided can cater. Pre-development necessary actions has been made like data gathering that provides the proponents a basic foundation of what to do or implement towards the making of the FlyNova system. Implementation has been broadened into programming languages, concepts, libraries and other technical requirements for technical people, the thesis panel and anyone that may concern the systems technical be aware of at least how the system is made. Lastly, software and hardware requirements are list down for user's knowledge of which devices and application the system can run.

## **4 Performance Analysis**

### **4.1 Introduction**

In this chapter, the proponents does put the key ingredients of developing the system, which are the fundamental information, into writing in order to see what methods are being used in data gathering. Such methods include survey, interviews and others which will be futher discussed and broaden below.

The proponents gathered information through brainstorming and conducting an interview with the event organizer regarding how the current system works and handles the registration process in order to monitor the number of participants that were attending the event. Afterwards, the proponents decided to review the current system to determine the problems that the event organizer encountered. Finally, the proponents have an idea of developing the Guest Qualification Control and Sponsor Management System with QR Code and Chat Support for the CXO Project.

### **4.2 Data Gathering**

As basis of the sites's core functions and processes, data gathering is a necessary processes in the development. This process is where the proponents broadens of how data gathering

#### **4.2.1 Research**

Every study needs reliable sources in order to come up with an objective perspective towards a given or choice of topic. To obtain reliable sources, the proponents chose many methods as source of information. One of which is the internet which for most IT people, internet can be reliable specially when the one who is into research is knowledgeable where to find the most reliable ones. Second are the e-books provided by the organizations that in turns plays a big role in the system, development and the study itself.

#### **4.2.2 Consultation**

To ensure frequent grammar-checking, proofreading, ensuring that concepts are well explain and checking the accordance of the thesis with Flesch-Kincaid readability tests to have the lowest score possibility to obtain utmost clarity and reability, the proponents ensures that recurrent consultation of the thesis with its thesis advisor is strictly observed.

#### **4.2.3 Surveys**

To ensure that the gathered information are applicable with the current state of technology, the proponents also consider conducting a survey to get a straight lead. With this, the proponents can therefore be sure that the problem observed in the first chapters of the thesis are really experienced and needs to be shed with light.



#### **4.2.4 Documentation**

As for the overall gathered information by the proponents, everything has been put down into writing in order to express the sources and generated objective criticisms and underlying solution towards the problems with clarity and conciseness in a structural manner.

#### **4.3 Result and Analysis**

Consequently, by correlating the gathered information from various sources like interviews, surveys, documentations and research, the results matches accordingly with what is being observed by the proponents, that the system, FlyNova, vastly beneficial and greatly helpful, is highly welcomed in different institutions to be one of those that augments innovation in terms of developing ways in memorizing airport codes and help students consume them.

#### **4.4 Summary**

The proponents summarized in this chapter the necessary actions and methods needed to be executed in order to obtain the information needed that plays a big part in the system's development.

As the summarization progresses, the proponents come up with an outlook that the system, FlyNova, as one of its kind system, will be a big help and will augment innovative ways in memorizing and familiarizing airport codes.

## **5 Conclusion**

### **5.1 Introduction**

Throughout the progress of this study, the gathered information does prove that there is a heavy need to introduce new ways of memorizing and consuming airport codes for the tourism students. On the other hand, internet as a large scale platform lacks discovery on its potential in terms of things that may have been done but not yet done.

Combining these ideas has given the proponents the opportunity to make the study named “FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management Students,” which aims to shed light to the current state of technology that students are bored in memorizing in ways and method commonly used in the present day.

Finally, as the system and thesis period is nearing its end phase, the proponents then came up with the solution accordingly, that the system proposed is very timely that at this moment in time it is grabbing the opportunity to innovate a new way for tourism students to memorize and consume airport codes.

### **5.1 Recommendation**

The proponents recommend that having this study as first of its kind, that the future studies consider this thesis as basis of innovating new ways of making methods in memorizing and consuming airport codes of the proponent’s fellow tourism students who are currently having difficulties in doing so in the present time.

## 5.2 Summary

This chapter may serve as quick overview of all the chapters written beforehand in this thesis named “FlyNova: A Web-based Flight Booking Simulation Game using Airport Codes for Tourism Management Students.”

In chapter one, the proponents elaborated the current state of technology, the problems arose upon period of research and also the objective in order to permeate the problem in an accordingly manner.

In chapter two, the proponents discussed the theoretical framework that contains the essential and critical practices and framework taken at hand in order to have a common structure, goal and order in the development of the system.

In chapter three, the proponents discussed the system visually by the used of diagrams and also provided the software and hardware need from both parties in order to achieve optimal operations of the system upon usage.

In chapter four, the proponents analysed the system’s performance by elaborating the data gathering processes.

Lastly, in chapter five, comes the recommendations, and conclusion on the proponents towards the development of the system and thesis on its ending phase.

**APPENDIX A**  
**CURRICULUM VITAE**

## **Jimwel Trabado Anobong**

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Primary: St. Benedict School of Novaliches  
Secondary: St. Benedict School of Novaliches  
Tertiary: STI College of Novaliches  
(Bachelor of Science in Information Technology)

### **SEMINARS ATTENDED:**

- Programmers Developers Tech Fest 2019 (Azure Kubernetes Service, Event Driven Containers with KEDA, Sharepoint & Office Development, PowerApps & Microsoft Flow, Azure SQL Database Hyperscale), iAcademy Nexus Yakal, Makati City - August 10<sup>th</sup>, 2019
- “Becoming a Successful Real-world Web Developer” by HiveLabsTech – March 2018

### **AWARDS**

- 1<sup>st</sup> Runner Up – Codefest 2019 Cluster Level, STI College
- Entrant – Codefest 2019 Cluster Level, STI College
- Champion – Codefest 2019 Local Level, STI College of Novaliches
- Champion – Codefest 2018 Local Level, STI College of Novaliches
- Participant – Codefest 2018 Cluster Level, STI College

### **CERTIFICATES / CERTIFICATIONS**

- US English Level 1 – Freelancer Technology Pty Ltd. Australia
- PHP Level 1 – Freelancer Technology Pty Ltd. Australia
- HTML Fundamentals Course – SoloLearn Inc. Pleasanton, CA #1014-4824165
- PHP Tutorial Course - SoloLearn Inc. Pleasanton, CA #1059-4824165
- Judge – Caloocan Division Technolympics 2018, Computer Systems Servicing Competition
- Judge – Caloocan Division Technolympics 2018, Technical Drafting Competition
- Leadership Award – Frontrow International Inc., 2016

### **JOB EXPERIENCE**

- 2016 – 2019 – Student Assistance, STI College of Novaliches, MIS Department

### **SKILLS**

- Information-technology operations (Reformatting Services, Computer Hardware and Software Troubleshooting, Server Setup)
- Persuasive Speaking
- Windows Forms Development (Visual C#, Visual Basic)
- Front-end Web Development Languages (HTML, CSS, and JS/Ecmascript 6)

- Back-end Web Development Languages (PHP)
- Database Management (MySQL, MSSQL)
- Application Development with Java
- Office Applications (Access, PowerPoint, Word, Visio, Excel, Publisher)

## REFERENCES

- Ferdinand Javines Jr.  
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Primary: Placido Del Mundo Elementary School

Secondary: Ismael Mathay Sr High School

Tertiary: STI College of Novaliches  
(Bachelor of Science in Information Technology)



### **SEMINARS ATTENDED:**

- 21<sup>st</sup> National Youth Convention (STI College Novaliches)

### **SKILLS:**

- Proficient in Microsoft Office such as Microsoft Office Word, Microsoft Office Power Point and Microsoft Office Excel.
- Knowledge in PHP, HTML, and CSS, Javascript

## Jessica B. Echon

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09388422775



Primary: G.S.IS. Village Elementary School

Secondary: Talipapa High School

Tertiary: Tertiary: STI College Novaliches  
(Bachelor of Science in Information Technology)

### SEMINAR ATTENDED:

- 21<sup>st</sup> National Youth Convention (STI College Novaliches)

### SKILLS:

- Programming (Java C++, Microsoft Visual Basic, C# )
- Microsoft (Microsoft Word, Microsoft Excel, Microsoft Powerpoint)
- Database (My SQL)
- Proficient in Microsoft Office such as Microsoft Office Word, Microsoft Office Power Point and Microsoft Office Excel.



## **APPENDIX B**

### **AIRPORT CODES**

#### **(FIRST 500 OVER 8992 AIRPORTS)**

**\* MINIMIZED TO 500 FOR 8992 AIRPORTS WILL COVER MORE THAN  
20 OR MORE PAGES**

AAA	Anaa Airport	ABQ	Albuquerque International Sunport
AAB	Arrabury Airport	ABR	Aberdeen Regional Airport
AAC	El Arish International Airport	ABS	Abu Simbel Airport
AAD	Adado Airport	ABT	Al-Baha Domestic Airport
AAE	Rabah Bitat Airport (Les Salines Airport)	ABU	Haliwen Airport
AAF	Apalachicola Regional Airport	ABV	Nnamdi Azikiwe International Airport
AAG	Arapoti Airport	ABW	Abau Airport
AAH	Merzbrück Airport	ABX	Albury Airport
AAI	Arraias Airport	ABY	Southwest Georgia Regional Airport
AAJ	Cayana Airstrip	ABZ	Aberdeen Airport
AAK	Aranuka Airport	ACA	General Juan N. Álvarez International Airport
AAL	Aalborg Airport	ACB	Antrim County Airport
AAM	Mala Mala Airport	ACC	Kotoka International Airport
AAN	Al Ain International Airport	ACD	Alcides Fernández Airport
AAO	Anaco Airport	ACE	Lanzarote Airport
AAP	Aji Pangeran Tumenggung Pranoto International Airport	ACM	St. Gallen–Altenrhein Airport
AAQ	Anapa Airport	ACI	Alderney Airport
AAR	Aarhus Airport	ACJ	Anuradhapura Airport
AAS	Apalapsili Airport	ACK	Nantucket Memorial Airport
AAT	Altay Airport	ACL	Aguaclara Airport
AAU	Asau Airport	ACM	Arica Airport
AAV	Allah Valley Airport	ACN	Ciudad Acuña International Airport
AAX	Araxá Airport	ACP	Sahand Airport
AAZ	Al Ghaydah Airport	ACR	Araracuara Airport
ABA	Abakan International Airport	ACS	Achinsk Airport
ABB	Asaba International Airport	ACT	Waco Regional Airport
ABC	Albacete Airport	ACU	Achutupo Airport
ABD	Abadan International Airport	ACV	Arcata-Eureka Airport
ABE	Lehigh Valley International Airport	ACX	Xingyi Wanfenglin Airport
ABF	Abaiang Atoll Airport	ACY	Atlantic City International Airport
ABG	Abingdon Airport	ACZ	Zabol Airport
ABH	Alpha Airport	ADA	Adana Sakirpasa Airport
ABI	Abilene Regional Airport	ADB	Adnan Menderes Airport
ABJ	Port Bouet Airport (Felix Houphouet Boigny International Airport)	ADC	Andakombe Airport
ABK	Kabri Dar Airport	ADD	Bole International Airport
ABL	Ambler Airport	ADE	Aden International Airport
ABM	Northern Peninsula Airport	ADF	Adiyaman Airport
ABN	Albina Airstrip	ADG	Lenawee County Airport
ABO	Aboisso Airport	ADH	Aldan Airport
ABP	Atkamba Airport	ADI	Arandis Airport
		ADJ	Amman Civil Airport (Marka International Airport)

ADK	Adak Airport	AFT	Afutara Airport
ADL	Adelaide Airport	AFW	Fort Worth Alliance Airport
ADM	Ardmore Municipal Airport	AFY	Afyon Airport
ADN	Andes Airport	AFZ	Sabzevar Airport
ADO	Andamooka Airport	AGA	Agadir–Al Massira Airport
ADP	Ampara Airport	AGB	Augsburg Airport
ADQ	Kodiak Airport	AGC	Allegheny County Airport
ADR	Robert F. Swinnie Airport	AGD	Anggi Airport
ADS	Addison Airport	AGE	Wangerooge Airfield
ADT	Ada Municipal Airport	AGF	Agen La Garenne Airport
ADU	Ardabil Airport	AGG	Angoram Airport
ADV	Ed Daein Airport	AGH	Ängelholm–Helsingborg Airport
ADW	Andrews Field (Andrews Air Force Base)	AGI	Wageningen Airstrip
ADX	RAF Leuchars	AGJ	Aguni Airport
ADY	Alldays Airport	AGK	Kagua Airport
ADZ	Gustavo Rojas Pinilla International Airport	AGL	Wanigela Airport
AEA	Abemama Atoll Airport	AGN	Angoon Seaplane Base
AEB	Baise Bama Airport	AGO	Magnolia Municipal Airport
AEE	Adareil Airport	AGP	Málaga Airport
AEG	Aek Godang Airport	AGQ	Agrinion Airport
AEH	Abéché Airport	AGR	Agra Airport
AEK	Aseki Airport	AGS	Augusta Regional Airport at Bush Field
AEL	Albert Lea Municipal Airport	AGT	Guaraní International Airport
AEM	Amgu Airport	AGU	Lic. Jesús Terán Peredo International Airport
AEO	Aioun el Atrouss Airport	AGV	Oswaldo Guevara Mujica Airport
AEP	Jorge Newbery Airpark	AGW	Agnew Airport
AEQ	Ar Horqin Airport	AGX	Agatti Aerodrome
AER	Sochi International Airport	AGZ	Aggeneys Airport
AES	Ålesund Airport, Vigra	AHB	Abha Regional Airport
AET	Allakaket Airport	AHC	Amedee Army Airfield
AEU	Abu Musa Airport	AHD	Ardmore Downtown Executive Airport
AEX	Alexandria International Airport	AHE	Ahe Airport
AEY	Akureyri Airport	AHF	Arapahoe Municipal Airport
AFA	San Rafael Airport	AHH	Amery Municipal Airport
AFD	Port Alfred Airport	AHI	Amahai Airport
AFF	United States Air Force Academy Airfield	AHJ	Hongyuan Airport
AFI	Amalfi Airport	AHL	Aishalton Airport
AFK	Kondavattavan Tank Seaplane Base	AHM	Ashland Municipal Airport
AFL	Alta Floresta Airport	AHN	Athens Ben Epps Airport
AFN	Jaffrey Airport–Silver Ranch	AHO	Alghero-Fertilia Airport
AFO	Afton Municipal Airport	AHS	Ahuas Airport
AFR	Afore Airport	AHU	Cherif Al Idrissi Airport
AFS	Zarafshan Airport	AHW	Saih Rawl Airport

AHY	Ambatolahy Airport	AKI	Akiak Airport
AHZ	Alpe d'Huez Airport	AKJ	Asahikawa Airport
AIA	Alliance Municipal Airport	AKK	Akhiok Airport
AIC	Ailinglaplap Airok Airport	AKL	Auckland Airport
AID	Anderson Municipal Airport (Darlington Field)	AKM	Zakouma Airport
AIE	Aiome Airport	AKN	King Salmon Airport
AIF	Assis Airport	AKO	Colorado Plains Regional Airport
AIG	Yalinga Airport	AKP	Anaktuvuk Pass Airport
AIH	Aiambak Airport	AKQ	Gunung Batin Airport
AII	Ali-Sabieh Airport	AKR	Akure Airport
AIK	Aiken Municipal Airport	AKS	Auki Gwaunaru'u Airport
AIL	Ailigandí Airport	AKT	RAF Akrotiri
AIM	Ailuk Airport	AKU	Aksu Airport
AIN	Wainwright Airport	AKV	Akulivik Airport
AIO	Atlantic Municipal Airport	AKW	Aghajari Airport
AIR	Aripuanã Airport	AKX	Aktobe Airport
AIS	Arorae Island Airport	AKY	Sittwe Airport
AIT	Aitutaki Airport	ALA	Almaty International Airport
AIU	Enua Airport	ALB	Albany International Airport
AIV	George Downer Airport	ALC	Alicante–Elche Airport
AIW	Ai-Ais Airport	ALD	Alerta Airport
AIY	Atlantic City Municipal Airport (Bader Field) (closed 2006)	ALE	Alpine–Casparis Municipal Airport
AIZ	Lee C. Fine Memorial Airport	ALF	Alta Airport
AJA	Ajaccio Napoleon Bonaparte Airport	ALG	Houari Boumediene Airport
AJF	Al-Jawf Domestic Airport	ALH	Albany Airport
AJI	Agri Airport	ALI	Alice International Airport
AJJ	Akjoujt Airport	ALJ	Alexander Bay Airport
AJK	Arak Airport	ALK	Asella Airport
AJL	Lengpui Airport	ALL	Albenga Airport
AJN	Ouani Airport	ALM	Alamogordo–White Sands Regional Airport
AJR	Arvidsjaur Airport	ALN	St. Louis Regional Airport
AJS	Punta Abrejos Airstrip	ALO	Waterloo Regional Airport
AJU	Santa Maria Airport	ALP	Aleppo International Airport
AJY	Mano Dayak International Airport	ALQ	Alegrete Airport
AKA	Ankang Wulipu Airport	ALR	Alexandra Aerodrome
AKB	Atka Airport	ALS	San Luis Valley Regional Airport
AKC	Akron Fulton International Airport	ALT	Alenquer Airport
AKD	Akola Airport	ALU	Alula Airport
AKE	Akieni Airport	ALW	Walla Walla Regional Airport
AKF	Kufra Airport	ALX	Thomas C. Russell Field
AKG	Angukanak Airport	ALY	El Nouzha Airport
AKH	Prince Sultan Air Base	ALZ	Alitak Seaplane Base
		AMA	Rick Husband Amarillo International Airport

AMB	Ambilobe Airport	ANW	Ainsworth Regional Airport
AMC	Am Timan Airport	ANX	Andøya Airport, Andenes
AMD	Sardar Vallabhbhai Patel International Airport	ANY	Anthony Municipal Airport
AME	Alto Molocue Airport	ANZ	Angus Downs Airport
AMF	Ama Airport	AOA	Aroa Airport
AMG	Amboin Airport	AOB	Annanberg Airport
AMH	Arba Minch Airport	AOC	Leipzig–Altenburg Airport
AMI	Selaparang Airport (closed 2011)	AOD	Abou-Deïa Airport
AMJ	Almenara Airport	AOE	Anadolu Airport
AMK	Animas Air Park	AOG	Anshan Teng'ao Airport
AML	Puerto Armuelles Airport	AOH	Lima Allen County Airport
AMM	Queen Alia International Airport	AOI	Ancona Falconara Airport
AMN	Gratiot Community Airport	AOJ	Aomori Airport
AMO	Mao Airport	AOK	Karpathos Island National Airport
AMP	Ampanihy Airport	AOL	Paso de los Libres Airport
AMQ	Pattimura Airport	AOM	Adam Airport
AMS	Amsterdam Airport Schiphol	AON	Arona Airport
AMT	Amata Airport	AOO	Altoona–Blair County Airport
AMU	Amanab Airport	AOP	Alfárez FAP Alfredo Vladimir Sara Bauer Airport
AMV	Amderma Airport	AOR	Sultan Abdul Halim Airport
AMW	Ames Municipal Airport	AOS	Amook Bay Seaplane Base
AMX	Ammaroo Airport	AOT	Aosta Valley Airport
AMY	Ambatomainty Airport	AOU	Attapeu International Airport
AMZ	Ardmore Airport	APA	Centennial Airport
ANB	Anniston Regional Airport	APB	Apolo Airport
ANC	Ted Stevens Anchorage International Airport	APC	Napa County Airport
AND	Anderson Regional Airport	APF	Naples Municipal Airport
ANE	Angers – Loire Airport	APG	Phillips Army Airfield
ANF	Cerro Moreno International Airport	APH	A.P. Hill Army Airfield
ANG	Angoulême – Cognac International Airport	API	Captain Luis F. Gómez Niño Air Base
ANI	Aniak Airport	APK	Apataki Airport
ANJ	Zanaga Airport	APL	Nampula Airport
ANK	Etimesgut Air Base	APN	Alpena County Regional Airport
ANL	Andulo Airport	APO	Antonio Roldán Betancourt Airport
ANM	Antsirabato Airport	APP	Asapa Airport
ANN	Annette Island Airport	APQ	Arapiraca Airport
ANO	Angoche Airport	APR	April River Airport
ANP	Lee Airport	APS	Anápolis Airport
ANQ	Tri-State Steuben County Airport	APT	Marion County Airport (Brown Field)
ANR	Antwerp International Airport	APU	Apucarana Airport
ANS	Andahuaylas Airport	APV	Apple Valley Airport
ANU	V. C. Bird International Airport	APW	Faleolo International Airport
ANV	Anvik Airport	APX	Arapongas Airport

APY	Alto Parnaíba Airport	ASH	Nashua Airport (Boire Field)
APZ	Zapala Airport	ASI	RAF Ascension Island (Wideawake Field)
AQA	Araraquara Airport	ASJ	Amami Airport
AQB	Quiché Airport	ASK	Yamoussoukro Airport
AQG	Anqing Tianzhushan Airport	ASL	Harrison County Airport
AQI	Al Qaisumah/Hafr Al Batin Airport	ASM	Asmara International Airport
AQJ	King Hussein International Airport	ASN	Talladega Municipal Airport
AQM	Ariquemes Airport	ASO	Asosa Airport
AQP	Rodríguez Ballón International Airport	ASP	Alice Springs Airport
AQS	Saqani Airport	ASQ	Austin Airport
AQY	Girdwood Airport	ASR	Erkilet International Airport
ARA	Acadiana Regional Airport	AST	Astoria Regional Airport
ARB	Ann Arbor Municipal Airport	ASU	Silvio Pettirossi International Airport
ARC	Arctic Village Airport	ASV	Amboseli Airport
ARD	Alor Island Airport	ASW	Aswan International Airport
ARE	Antonio (Nery) Juarbe Pol Airport	ASX	John F. Kennedy Memorial Airport
ARF	Acaricuara Airport	ASY	Ashley Municipal Airport
ARG	Walnut Ridge Regional Airport	ASZ	Asirim Airport
ARH	Talagi Airport	ATA	Comandante FAP Germán Arias Graziani Airport
ARI	Chacalluta International Airport	ATB	Atbara Airport
ARJ	Arso Airport	ATC	Arthur's Town Airport
ARK	Arusha Airport	ATD	Uru Harbour Airport
ARL	Arly Airport	ATE	Antlers Municipal Airport
ARM	Armidale Airport	ATF	Chachoan Airport
ARN	Stockholm Arlanda Airport	ATG	PAF Base Minhas
ARO	Arboletes Airport	ATH	Athens International Airport (Eleftherios Venizelos Airport)
ARP	Aragip Airport	ATI	Artigas International Airport
ARQ	El Troncal Airport	ATJ	Antsirabe Airport
ARR	Alto Río Senguer Airport	ATK	Atkasuk Edward Burnell Sr. Memorial Airport
ARS	Aragarças Airport	ATL	Hartsfield–Jackson Atlanta International Airport
ART	Watertown International Airport	ATM	Altamira Airport
ARU	Araçatuba Airport	ATN	Namatanai Airport
ARV	Lakeland Airport (Noble F. Lee Memorial Field)	ATO	Ohio University Airport
ARW	Arad International Airport	ATP	Aitape Airstrip
ARY	Ararat Airport	ATQ	Sri Guru Ram Dass Jee International Airport
ARZ	N'zeto Airport	ATR	Atar International Airport
ASA	Assab International Airport	ATS	Artesia Municipal Airport
ASB	Ashgabat International Airport	ATT	Atmautluak Airport
ASC	Ascención de Guarayos Airport	ATU	Casco Cove Coast Guard Station
ASD	Andros Town International Airport	ATV	Ati Airport
ASE	Aspen–Pitkin County Airport (Sardy Field)	ATW	Appleton International Airport
ASF	Narimanovo Airport	ATX	Atbasar Airport
ASG	Ashburton Aerodrome		

ATY	Watertown Regional Airport	AVW	Marana Regional Airport
ATZ	Assiut Airport	AVX	Catalina Airport
AUA	Queen Beatrix International Airport	AWA	Awasa Airport
AUC	Santiago Pérez Quiroz Airport	AWB	Awaba Airport
AUD	Augustus Downs Airport	AWD	Aniwa Airport
AUE	Abu Rudeis Airport	AWE	Alowe Airport
AUF	Auxerre – Branches Aerodrome	AWK	Wake Island Airfield
AUG	Augusta State Airport	AWM	West Memphis Municipal Airport
AUH	Abu Dhabi International Airport	AWN	Alton Downs Airport
AUI	Aua Island Airport	AWP	Austral Downs Airport
AUJ	Ambunti Airport	AWR	Awar Airport
AUK	Alakanuk Airport	AWZ	Ahvaz International Airport
AUL	Aur Airport	AXA	Clayton J. Lloyd International Airport
AUM	Austin Municipal Airport	AXB	Maxson Airfield
AUN	Auburn Municipal Airport	AXC	Aramac Airport
AUO	Auburn University Regional Airport	AXD	Alexandroupoli Airport (Dimokritos Airport)
AUP	Agaun Airport	AXE	Xanxere Airport
AUQ	Atuona Airport	AXF	Alxa Left Banner Bayanhot Airport
AUR	Aurillac – Tronquières Airport	AXG	Algona Municipal Airport
AUS	Austin–Bergstrom International Airport	AXJ	Amakusa Airfield
AUT	Atauro Airport	AXK	Ataq Airport
AUU	Aurukun Airport	AXL	Alexandria Airport
AUV	Aumo Airport	AXM	El Edén International Airport
AUW	Wausau Downtown Airport	AXN	Alexandria Municipal Airport (Chandler Field)
AUX	Araguaína Airport	AXP	Spring Point Airport
AUY	Anatom Airport	AXR	Arutua Airport
AUZ	Aurora Municipal Airport	AXS	Altus/Quartz Mountain Regional Airport
AVA	Anshun Huangguoshu Airport	AXT	Akita Airport
AVB	Aviano Air Base	AXU	Axum Airport
AVG	Auvergne Airport	AXV	Neil Armstrong Airport
AVI	Máximo Gómez Airport	AXX	Angel Fire Airport
AVK	Arvaikheer Airport	AYA	Ayapel Airport
AVL	Asheville Regional Airport	AYC	Ayacucho Airport
AVN	Avignon – Provence Airport	AYD	Alroy Downs Airport
AVO	Avon Park Executive Airport	AYG	Yaguara Airport
AVP	Wilkes-Barre/Scranton International Airport	AYI	Yari Airport
AVU	Avu Avu Airport	AYK	Arkalyk Airport
AVV	Avalon Airport	AYL	Anthony Lagoon Airport

# **APPENDIX C**

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## **APPENDIX D**

### **EXCLUSIVE INTERVIEW WITH MRS. CARESS SIMUANGCO EXCERPTS FROM AUDIBLE INTERVIEW WRITTEN AS A TRANSCRIPT**

Caress: "... of course those kids are also finding easiest ways for them to have the memorization..." 0:00 – 0:14

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Caress: "So if this is the one that you will provide, actually, I see this one as a good opportunity for the students to take. Why? They'll better understand it because this is where they go crazy."

"When you ask the (tourism) students, they'll say ", I'll go shift courses if memorizing those codes are mandatory." Of course, it is mandatory, you are not likely going to a place you did not know right."

"As a tourism student, that's our edge. But honestly, no one can memorize it all. Only crazy people (likely) maybe can. We also need system to ease out these instances (memorizing airport codes and alike), same as you do. It would assist us greatly, so I find no problem in proposing the system." 3:12 – 3:53

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Caress: "If you didn't this one, then be confident enough that you [inaudible] made something like this. I'll be truly thankful. Imagine, you are most expected to focus on industry solutions today, but you did take time to make a system for us, right? Look at me, I find it hard to incorporate those (airport codes) to those kids, believe me! How many times did I handle Amadeus for them?" 10:05 – 10:24

Jimwel: "Many of those go fail?" 10:25

Caress: "Not that many fails, but rather, think of it that they are experiencing difficulties." 10:26 – 10:30

Orven: "Yes ma'am" 10:31

Caress: "Because, most likely, these kids are frightened. Even just from the sound of it. Just say 'memorization' they panic already" 10:31- 10:34

**APPENDIX E**  
**SURVEY FORM**



STI College of Novaliches  
Thesis Survey for Thesis Title:  
FlyNova: A Web-based Flight Booking Simulation Game Using  
Airport Codes for Tourism Management Students

Members:  
Anobong, Jimwel Trabado  
Echon, Jessica  
Manzano, Bryan Orven

Name (Required): \_\_\_\_\_

Student Number (Required): \_\_\_\_\_ Year and Section (Required): \_\_\_\_\_

- \_\_\_\_\_ 1. Are you aware that every airport or airstrip has a corresponding code issued by International Air Transport Association?  
a. Yes    b. No
- \_\_\_\_\_ 2. How many local airport codes are you aware of (including the name and location)?  
a. 0    b. 1-3    c. 4-6    d. 7-9    e. 10 or above
- \_\_\_\_\_ 3. Do you currently have a subject that requires you to memorize these airport codes? Or if not, do you happen to expect something in academic or industrial setting that these airport codes will be needed to be memorized as a tourism student?  
a. Yes    b. No    c. I don't know
- \_\_\_\_\_ 4. How many international airport codes are you aware of (including the name and location)?  
a. 0    b. 1-3    c. 4-6    d. 7-9    e. 10 or above
- \_\_\_\_\_ 5. Do you find it hard to memorize airport codes (specially when you are made to memorize 20 or more in a single sitting)?  
a. Yes    b. No    c. Probably    d. I don't know

#### IDENTIFICATION

Identify the following airport codes. These codes may either be local or international.

IATA	Name	Location
1. _____	Manila International Airport Authority / Ninoy Aquino International Airport	Pasay, Philippines
2. BCD	_____	Bacolod City, Philippines
3. _____	Sibulan Airport	Dumaguete, Philippines
4. _____	Godofredo P. Ramos (Caticlan/Boracay) Airport	Boracay, Philippines
5. _____	Virac Airport	Catanduanes, Philippines
6. JFK	_____	Queens, NY, USA
7. _____	Guangzhou Baiyou International Airport	Guangdong, China
8. LHR	Heathrow Airport	_____
9. HKR	_____	Sky Plaza Rd., Chek Lap Kok, HK
10. NRT	_____	Furugome, Chiba, Narita, JP

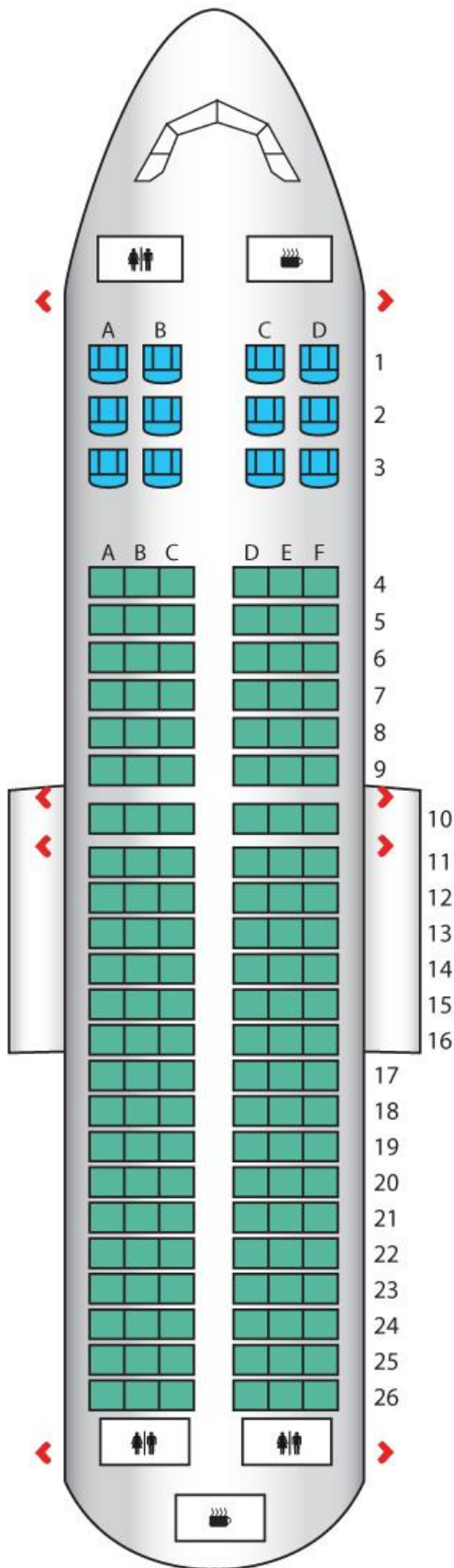
Remarks / Suggestion / Message to the Proponents:

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**APPENDIX F**

**CARRIER SEAT PLANS**



**F<sub>1</sub>**

**Airbus 320**

**Seat Plan**

**A1 – D3**

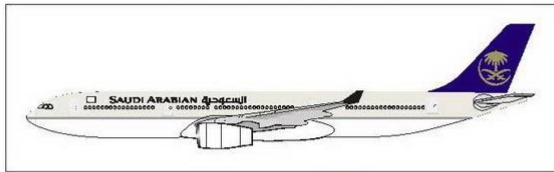
First Class

**A4 – F26**

Economy Class



## Airbus A330-300



**F<sub>2</sub>**

**Airbus 330-300**

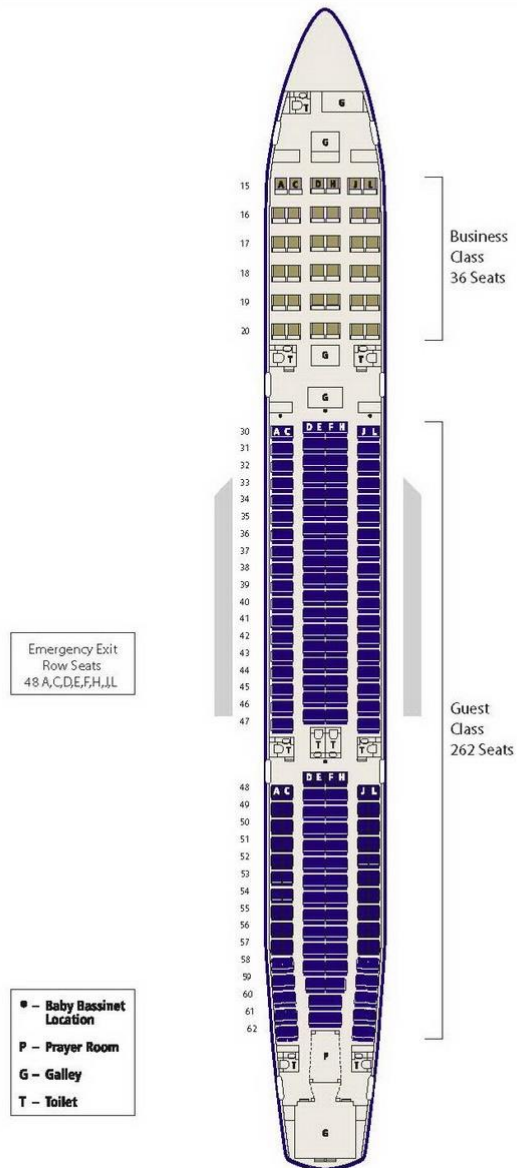
**Seat Plan**

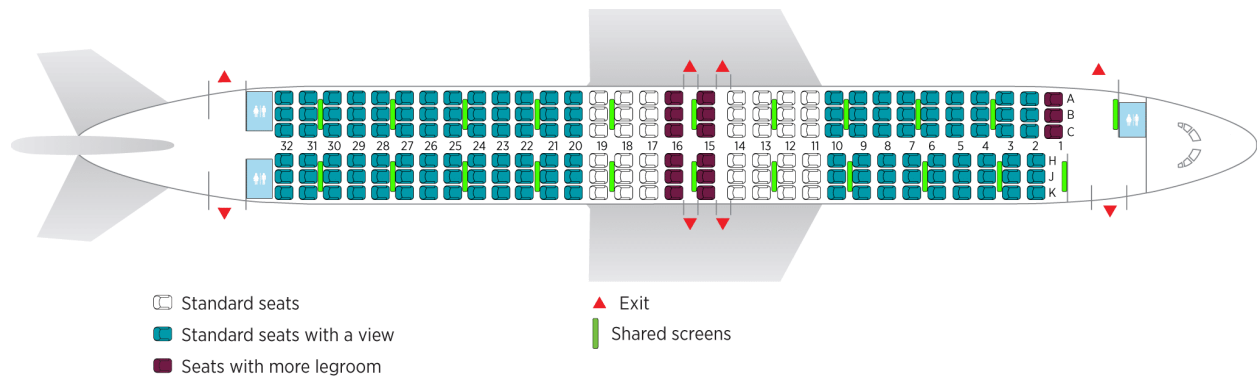
**A15 – L20**

**Business Class**

**A30 – L47, A48 – L62**

**Economy Class**





**F<sub>3</sub>**

**Boeing 737-800**

**Seat Plan**

**A1 – K32**

Economy Class