

# Tour Me: A Platform for Travellers

Keet Malin Sugathadasa

Department of Computer Science & Engineering, University of Moratuwa, Sri Lanka

keetmalin.13@cse.mrt.ac.lk

**Abstract - Sri Lanka is one of the most traveled destinations in the world. But facilities offered for travelers are not convenient enough to attract them and spread the word. On one side, there are travelers starving for adventure and on the other side, there are entrepreneurs seeking for job opportunities around the area. “Tour Me” provides a platform for travelers to connect with hotels, guides, photographers, drivers around the area. It allows the traveler to plan an entire journey around the country just by a single tap. Further, young entrepreneurs can showcase their talents to travelers and support the tourism industry. The uniqueness of this application comes with its completeness and the ability to render much demanded services to travelers in the country.**

## I. INTRODUCTION

The tourism industry of Sri Lanka is one of the major revenue streams of the country. Being one of the main travel destinations in the world, tourism industry of Sri Lanka has become a competitive and important area in the country. The attractive and mind blowing wonders are some of the reasons why tourists and travelers pick Sri Lanka as an epic travel destination. Providing a platform for the tourism industry to get together and help the tourists feel like they are at home will indeed strengthen the forces of the Sri Lankan tourism industry.

“Tour Me” is a community and a platform which renders services to travelers and tourists, to empower tourism and employment opportunities in Sri Lanka. With a single click, the users can plan their own journey according to all their needs. They are allowed to change routes and locations to get the best benefits. Users are also allowed to suggest better routes that they experience after traveling a journey. Whilst providing the tourists with the capability of creating their own tours, the system also provides a platform for the guides, photographers and drivers to gain employment opportunities with respect to the tourism industry.

“Tour Me” is a web and mobile based application that provides travellers and tourists the ability to connect with the hotels, photographers, drivers and guides of Sri Lanka. This system also provides the facility to create their own tours to travel around Sri Lanka. The system has been already deployed and it covers all the objectives of the system to provide the utmost usability experience to the user.

The paper is structured as follows. Section II describes the literature relevant to the product which includes a review on similar products. Section III elaborates the system

models, including system requirements and system design. Section IV is based on the implementation aspects of the system. Section V elaborates the testing and analysis of the product which is then followed by references in section VI.

## II. LITERATURE REVIEW

There are many systems which are being implemented with respect to supporting the tourism industry. Most of these systems are information systems that provide basic information about travel locations in Sri Lanka.

Tourists or travelers who wish to tour in Sri Lanka, expect an easy system that would help them to guide through their journey with the least expense and hassle. The “Official Sri Lanka Tourism Website” [1] is one of the major information sources that provide facilities to tourists in Sri Lanka. These facilities are very expensive and for hotels and restaurants to get involved in the tourism industry, they need to advertise in this website and then gain access to the market. But what if average income hotels and restaurants wish to market their system in the industry. This opportunity would be missed by them because of the cost, they cannot bear on marketing.

Systems like “Jetwing Sri Lanka” [2] and “Sri Lanka Travel Guide” [3] are simple information systems that provides a fixed content to the users seeking information. On the other hand, international systems like “Foursquare” [4] and “Yelp” [5] builds a community around the people looking for restaurants and local businesses. “Tour Me” is complete travel application that provides details about hotels, local businesses, drivers, photographers, guides and many more. The comprehensiveness of this system allows the travelers to use this system as a hub for their travel purposes.

## III. SYSTEM MODELS

### A. System Requirements

The “Tour Me” system includes many useful features that are much needed by any tourist, coming down to Sri Lanka. The main functional requirement of the system is to calculate an optimum route for a journey. This allows the user to pick the location he or she wants to travel to. Besides this, the users are allowed to view the locations on a map which includes, hotels, banks, police stations, air lines and much more, which are useful for any tourist to know, when traveling in Sri Lanka. Besides this, hotels, guides, photographers and drivers are allowed to create corporate profiles and manage them, so that the tourists can figure out,

what to pick when required. Another important functionality of the system is where it provides details of major attractions in Sri Lanka. This gives the user a clear idea on where to go and what to see depending on the budget and time available for them. The system also provides the capability of making reservations online, on hotels, guides, drivers and photographers.

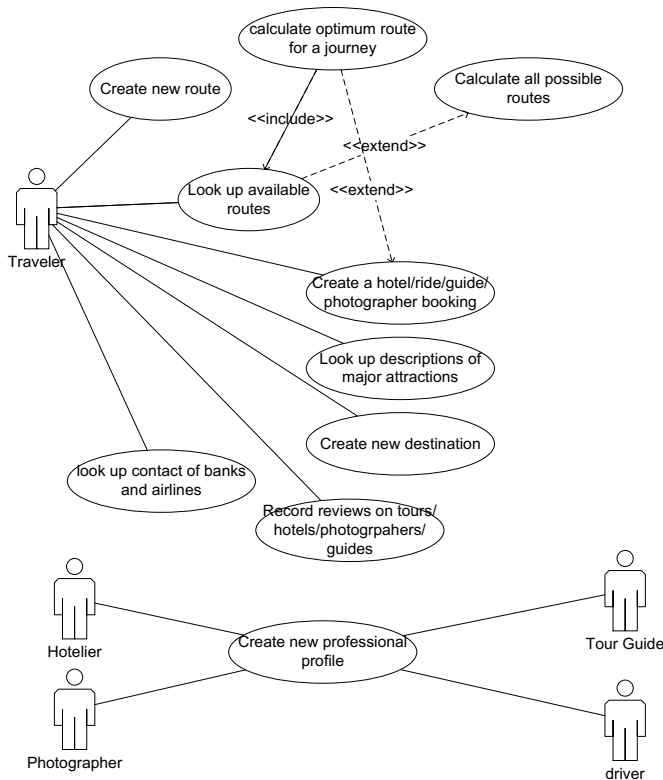


Fig. 1. Use Case Diagram

An application that supports the tourism industry of Sri Lanka has many competitors in the industry. Therefore, the application focuses on the usability of the system to provide understandability, learnability, operability and attractiveness. Reliability is the next key main feature that will give the user the trust and safety that they require to assure that they can rely on the application. Supportability is another important feature, because this system will be used by many different tourists who will definitely need the support of the administration. Therefore, this application provides features for supportability of the tourists.

A use-case diagram describes how a particular use case is realized within the design model, in terms of collaborating objects. The main actors of the system are travellers, hotels, guides, drivers and photographers. The traveller will be triggering most of the use cases. Which includes creating tours, add new destinations, look up corporate accounts, look up contacts and so on. Whilst the other four actors will be in charge of handling corporate accounts. These use cases include creating and updating corporate accounts which will be displayed to the travellers via the platform.

As the diagram depicts, calculating the optimum route includes another use case which is looking up available

routes. Calculate optimum route will extend into creating reservations with corporate accounts, because once a route is created, a user would like to make a reservation. The look up available routes use case, can be extended to another use case which will calculate all possible routes. This gives the possibility for the user to either select from the available routes or calculate all possible routes to get a clear picture on what is available.

### B. System Design

“Tour Me” system uses a Client Server Architecture in which, “presentation”, “application processing” and “data management” functions are physically separated. The presentation tier uses HTML5 and PhoneGap Cordova, the domain logic tier uses Symfony Framework [6] and PHP, and the Data storage tier uses MySQL Database.

Data access object class is an interface that will be implemented by the different data access objects as shown in the class diagram below. This creates a portal for the Objects to connect to the server and the database. The traveler class represents the main actor of the system which is the traveler/tourist who will be using the application. This class will be extending from an Abstract Class named ‘User’ where it gets all the characteristics relevant to a User. Traveler object can make payments with the corporate accounts and can create tours based on the locations he/she would like to travel to.

Corporate Account class is an abstract class that will be extended by many other specialized classes such as Hotels, Guides, Photographers and Rides. Object which are inherited from this class will be carrying out the payment process with the travelers and maintaining relevant details up to date with each of the accounts. This Abstract Class will be extending another Abstract Class named User.

The booking class keeps track of the booking/payment being done between the Traveler and the Corporate Account. The tour class is a mapping between the traveler and the route being chosen by the user. This object will contain information about the route selected, the date and time of the relevant tour. The route class keeps track of the locations and the route selected on the map. It contains an array of locations which can be travelled to while going on that route.

The contact class carries details of the emergency contact numbers needed by most of the travelers. These emergency contact numbers would be hospitals, airlines, banks and police stations.

The user is allowed to select multiple locations around the country or within a certain area, where he/she wishes to travel to. Depending on that, the system will calculate the optimum route for the traveler to take maximum use of his/her time and budget. Using these details, the system will go through the available routes in the database (look up available routes) and if a suitable match is found, the system will either produce that result as the output, or a modified one which best suites the user’s requirements. Main

intention is to provide a fast and optimum calculation to the user.

The sensitive data in this table is being kept encrypted due to security reasons. The 'last log in time' of each user is also saved in the 'log in' table, which can be used for auditing purposes.

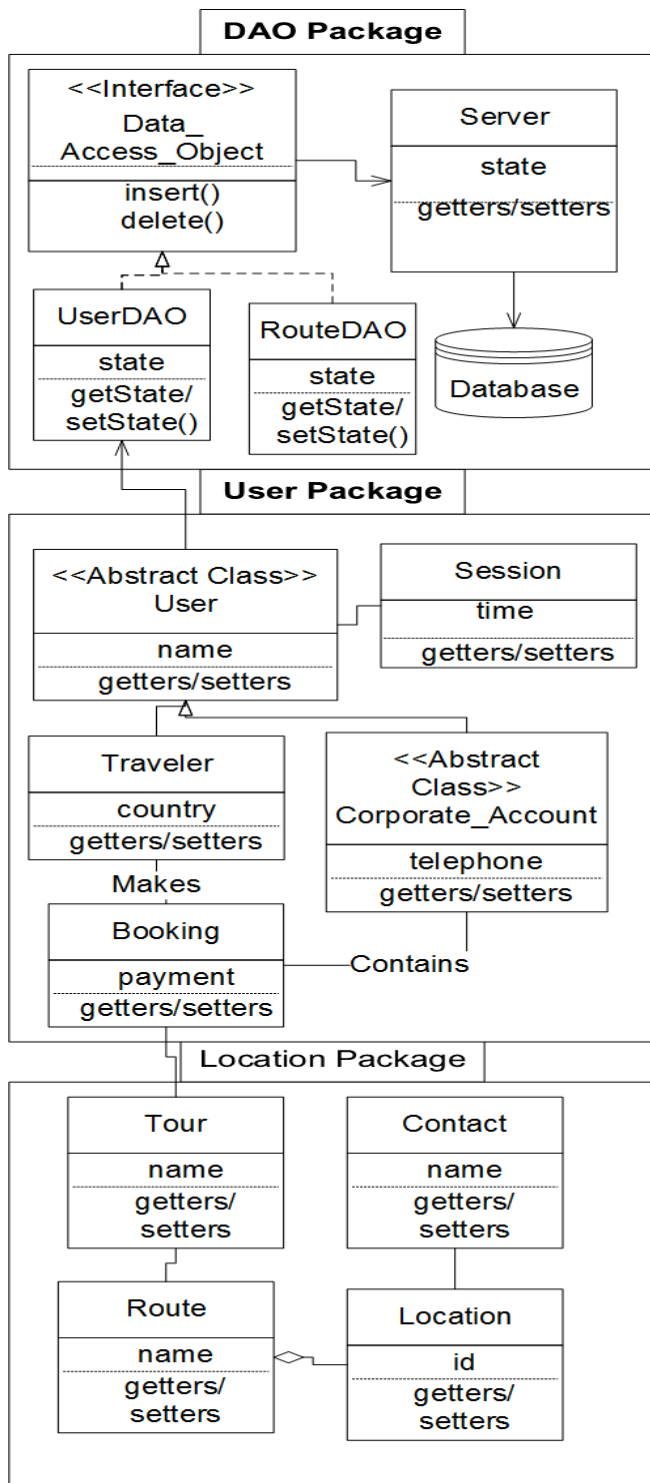


Fig. 2. Class Diagram

'User' table represents an abstract view of all the users in the system. The 'User' table is associated with a 'login' table that keeps track of the log in details of all the users.

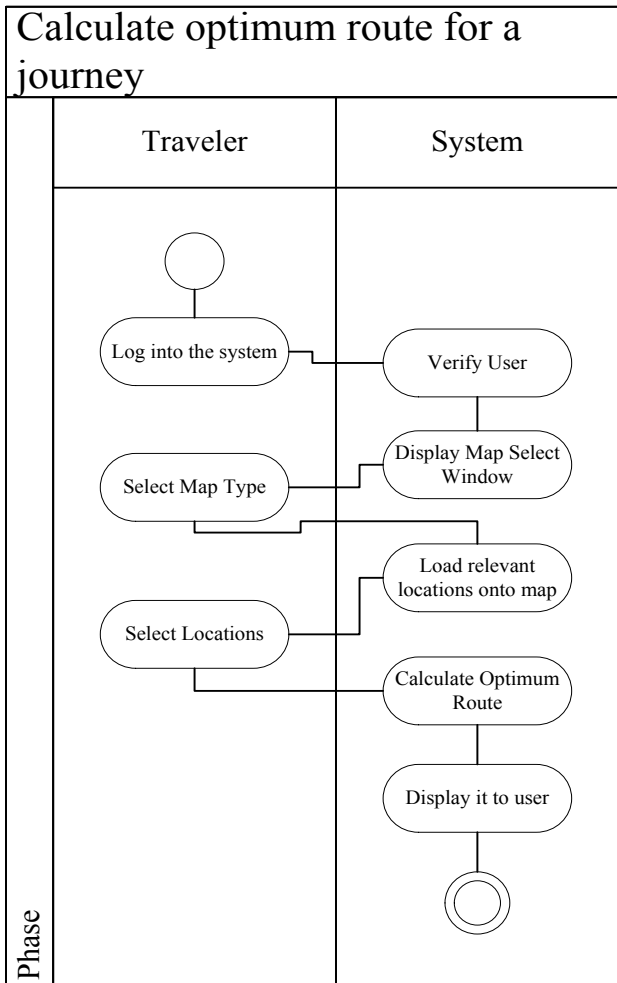


Fig. 3. Activity Diagram of Calculating optimum route

The 'User' table has a one to one relationship with the 'Corporate Account' table, which specializes itself into four main categories, namely hotels, guides, photographers and rides. Each corporate account has a one to many relationships with the table 'comments'. This table keeps track of the comments as well as reviews given by users with the number of reviews on each account. This is an important table because, many users make judgements based on the value of the rating for each corporate account. Therefore, access to this table is restricted only to certain levels of users with a proper access control matrix.

The 'Corporate Account' table has a one to one relationship with the 'town table' and it holds a relationship with 'table contact' which keeps the information related to banks, airlines, hospitals and police stations. Further, the corporate account table has a one to many relationships with the table 'Image' which is being used to store multiple images of the corporate account in the system.

The 'Corporate account' table is connected to the 'traveler' table via a many to many relationship, and in between, there lies a table named 'payment'. Every time a traveler makes a reservation or a booking with a 'corporate account', the details of that reservation and payments will be stored in the 'payment table'. This 'payment table acts as a relationship table, which describes the relationship that exists between the traveler and the corporate account.

The 'table location' contains data of major attractions in Sri Lanka. Whenever a user adds details of a new location to visit in Sri Lanka, those details will be saved in the 'location table' for future reference. These details will be used when showing the Sri Lankan map, where users are allowed to see the major attraction of the country and decide where to go to, in their tour. Each location has a relationship with the 'image table' as well as the 'town table' because each location needs to store their own image as well as the town that the location is situated in.

The table 'Route' keeps track of the routes created by each user and use it to display and suggest these routes whenever another user wants to visit a similar route. Therefore, this route has a one to many relationships with the location table, where each route has a set of locations or destinations, that are situated close by to that route.

#### IV. SYSTEM IMPLEMENTATION

##### A. Implementation Procedure

The system's main focus is to provide a rich usability experience to the user at the expense of security and performance. The system comes as a web application and as a mobile application. The system is being implemented using the three tier architecture. The data tier lies on a MySQL database on a server hosted online. The application layer is the backend of the system where it provides the necessary connections to the database of the system. The backend is being hosted on a server online and it is implemented using the symphony framework [6], which provides real time management of user session handling which is an essential part in this system.

The front end of the application lies on two different sections. One is the mobile device and the other is the web server where the front end website has been hosted online. The system was initially developed as a web application to be used via the browsers of computers and devices. But with the capabilities provided by the phonegap framework and the cordova plugins, the entire system was transformed into a mobile application which would support many mobile platforms in the market today, it includes android, iOS and Windows which are some of the leading mobile platforms in the industry.

The presentation layer, which is the mobile and the website, directly connects itself to the backend of the application which is being managed by the Symfony Framework [6]. The connection between the frontend of the application and backend of the system is being done via a Secure Socket Layer and this enhances the security features

of the system. This would remove the potential threats of having sniffers in between the connections.

Even though the system has been implemented to provide a better user experience to the users, the system has implemented a few security features to avoid inconsistencies of the system. The system uses "Google Recaptcha" [7] to ensure that any non-human bot is not able to maliciously create fake accounts and jeopardize the structure of the system. The sensitive data such as the passwords of the system are being saved into the database via a safe hashing system which uses a salting mechanism to strengthen the security.

On the Data tier and the application tier of the system, the database connections are transaction based where if any inconsistency occurs in any of the database activities, the system would either make sure that the activity is fully carried out before leaving or that the transaction has been rolled back to the previous state.

##### B. Most Important Algorithm

The "Tour Me" system provides a real time route calculation that gives the ability to the user to create their own tour. The google maps API comes with an in built library of algorithms that make fast route searching and optimized calculations possible. The algorithms being used inside the system is the "Dijkstra's Algorithm" [8], which is being used to calculate the shortest path between two locations of a map. The "Tour Me" system directly uses this algorithm provided by google map API to provide the users with the use case of calculating their own route.

"Tour Me" uses one of its own implementations that uses the Google APIs to calculate the nearby locations from a point within a certain radius. This is a widely used concept called Geofencing where software program uses the global positioning system (GPS) to define geographical boundaries. A Geofence is a virtual barrier. The system uses this concept to easily locate nearby important service centers to enhance the user experience and providing them ease in getting whichever service they require at the given point in time. The piece of code implemented in order to provide this feature given below.

```

Start LocationSearch

Input radius/location
Authorize Google API Key
Create locationList
Call google API within a radius and
filter locations, and call the return
function to obtain a list of nearby
locations.If locations found

    For each location:
        Store location in
        locationList
Get current Map
For each location in locationList
    Create marker on map
    Add location on to marker
    Create an info window for each
    location with details

```

Fig. 4. Main Algorithm of Searching Nearby Locations

C. Main Interfaces

Home page user interface has a guest or a user logging into the system for the first time. The user will be seeing this user interface as the Main Page of the system. This interface contains attractive images, links to other pages and travel motivation quotes to encourage the user and catch the attention of the user at a glance. If this interface fails to catch the eye of the user, the usage of the whole system may fail.

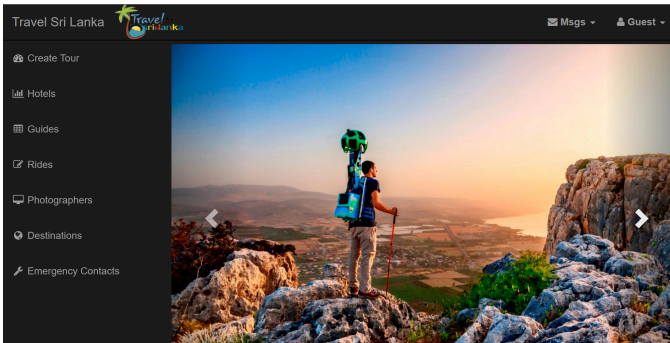


Fig. 5. Home Page User Interface

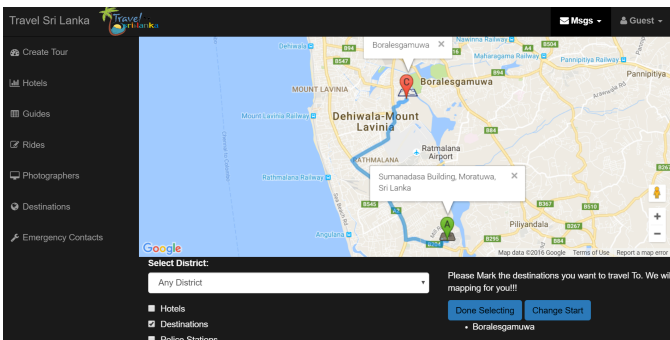


Fig. 6. Route Calculation Interface

Route interface will provide a map with routes connecting the locations that the traveler wishes to travel to.

This window will also show the costs that will be incurred and the number of days that will take to travel each route.

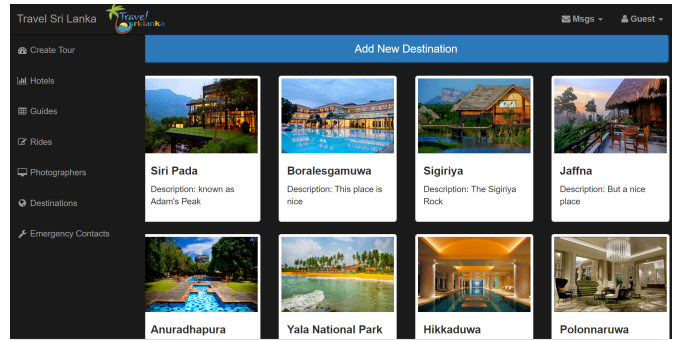


Fig. 7. Major Attractions Interface

Major attraction interface will provide details of major attractions and locations in Sri Lanka. This list will be sorted based on the number of ratings, each location has. When tapped on the location, a small modal shows the description along with images and a slider to easily swipe through the slider. A map for each location will also be displayed for convenience.

V. SYSTEM TESTING AND ANALYSIS

Testing of the system was carried out to most parts of the system. Most tests were carried out automatically, whereas some tests were carried out manually. Database and data integrity testing was carried out by writing test queries on a dummy database. The test queries will run automatically as a sequence in one given script. And the assertions will be checked whether the database is responding as intended. Self-verification will be done with the MySQL workbench. Each time the test is being run, the symphony framework will keep track of the tests and assertions in a test log.

Function testing was carried out to ensure that the proper use cases are met. The observations of each use case can be observed manually which is time consuming and hectic for a user. Therefore, necessary test cases were tested with the help of the Selenium IDE to automate and run each use case. The tests will finally show the assertions along with the use cases that produce the bugs. In the same manner, the user interface testing was carried out checking whether the interfaces provided to the use is functioning as expected.

VI. CONCLUSION AND FUTURE WORK.

The tourism industry in Sri Lanka is one of the major revenue streams of the country. Tourists coming down to Sri Lanka sometimes feels lost due to lack of proper guidance and lack of a proper platform for tourists to interact with the facilities they require. "Tour Me" has succeeded in providing tourists with a platform that will help them to plan an effective stay during their time in Sri Lanka. Unemployment issues in the tourism industry has struck many parts of the country. The word of mouth being the

only means of communication does not do any good for people who are not much in contacts with the industry, but who has the potential to do something. "Tour Me" creates a platform that will help the youth with the potential to join the tourism industry, an opportunity to gain access to the job market of the tourism industry.

Tourism industry of Sri Lanka is very competitive and gaining the market in the country is very difficult. Due to this reason the "Tour Me" system focuses on providing a rich user experience to the users and making them feel at home when using the application. Unlike other systems that exist in the market, "Tour Me" is not an information system. It is a community where everyone in the tourism industry can connect and share their knowledge about the aspects of tourism. This is proven to be a very effective concept where people like to know user experiences rather than reading a static text which only provides information regarding it. Many tourists who come down to Sri Lanka does not have any idea on where to travel or how to get guidance or a proper transportation facility. But the "Tour Me" application opens up the doors for potential entrepreneurs to enter and connect with the tourists to facilitate their needs.

As the system was developed, many observations came into the project. The fact of having all the necessary facilities in one application caught the attention of many people. This is something that everyone needs in today's busy day to day life. But some aspects which were not given in the scope were not implemented during the development of the application. This is mainly due to the inverse relationship between the system's complexity and the usability of the system. Marketing "Tour Me" to the industry is a major challenge and it would cost a significant amount to make an effect on the market. Once the

community has started to build itself up, it would become a stable system with everyone having the ability to know most of the information that everyone has shared.

As for future implementations of the product, the system would be implementing a new weather feature that would come with safety advices for each area of the country. This being really helpful for tourists who have no idea on what is happening around the country. Further the creating tour option for travelers will be enhanced by providing train and bus details with the help of google APIs. This can include other service facilities such as food centers and fuel stations that everyone needs in some point in time. The system will study the travelers and other travelers' patterns of travelling and disliking and use that information to suggest better options for other users.

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