MODERN TRIP ASSISTANT SYSTEM: A CASE STUDY

066

Project Proposal Report

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1 Declaration

1.1 Members

We hereby declare that the project proposal report for project ‘MODERN TRIP ASSISTANT SYSTEM’ is based on our own work under the supervision of MS. UTHPALA SAMARAKOON.

We further certify that

I. This report hasn’t been submitted to any other institute or any other organizations or any other university in Sri Lanka or abroad.
II. We have followed the guidelines in the document published in courseweb.

……..……

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1.2 Supervisor

2 Abstract

Nowadays tourism is very popular and growing industry in most of the countries. Following to that the business on tourism is also very high. Tourism is an important factor for the economy as well. It contributes to the economic growth and it helps for the development of the country. In Sri Lanka, we had some barriers on tourism due to the civil war and since the end of civil war, the growth of tourism is massive and impressive. Nowadays we can see the tourist arrivals and also some developments in most of the places in Sri Lanka. So In future we will be able to see many more improvements and developments on tourism in Sri Lanka.

This research is to provide a best helper or an assistant for the tourists for the current sophisticated lifestyle. Nowadays we can see many tourist places in Sri Lanka and here we don't have a perfect trip assistant or a trip guide. Even though there are some applications to provide some service, those applications are not complete. Our system which we have planned to develop will help tourists in many ways. Our system will be helpful to plan a complete trip. It includes shortest path prediction, navigation, weather assistant, virtual trip guide, multiple physical guides, automated payment plan, time management, tourist place prediction, blind assistance, image processing, virtual image capturing & sharing, budget calculation, booking facilities, etc. To achieve these goals we will implement mobile application and web based application. These facilities will help tourists to plan and execute a complete trip without any difficulties.

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3 Introduction

3.1 Background study

Tourism is very popular industry in most of the countries. In Sri Lanka after the civil war we are able to see a vast growth in tourism. The main reason behind this is the increased number of tourist arrival and also due to that the development of tourist places and the economy of our country increased. Providing suitable facilities to the tourists will increase the tourist arrivals and it will help for the development of our country. Nowadays Sri Lanka is one of the popular tourism countries in Asia.

The below figure shows the improvement of tourist places and this pattern of improvement will continue if we provide the necessary services to tourists.

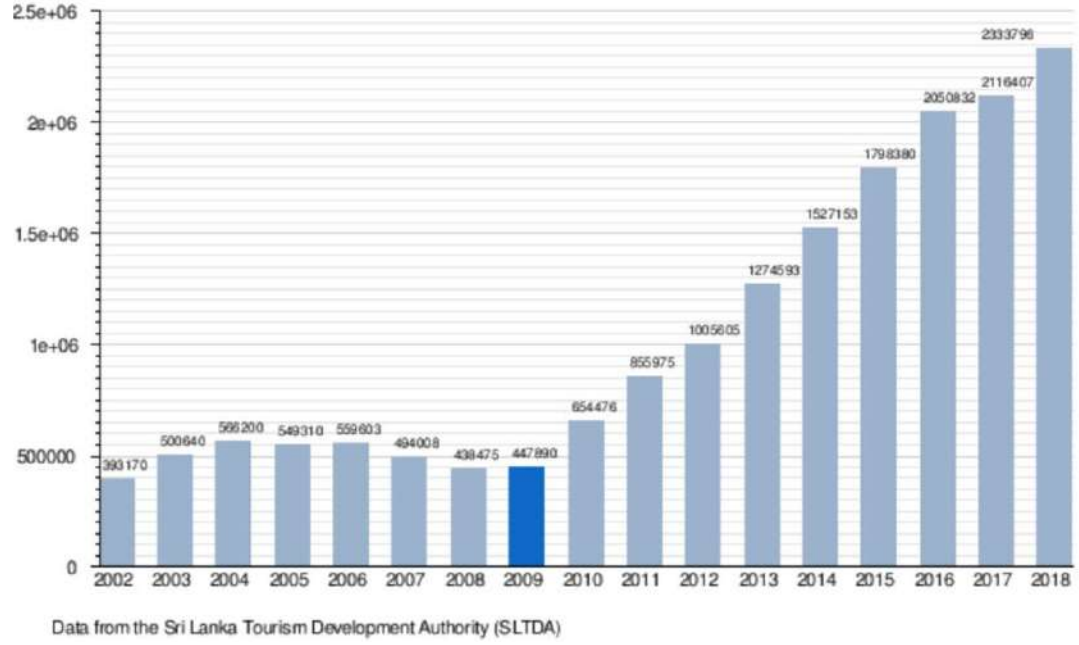

Figure 3.1.1 Data from Sri Lanka Tourism Development Authority (SLTDA)

According to the data from Sri Lanka Tourism Development Authority we can see rapid improvement from 2009. Last year the development level was thrice as the development level of 2010.

Rank	Country	2016	2017	2018
1	India	356,729	384,628	424,887
2	China[10]	271,577	268,952	265,965
3	United Kingdom	188,159	201,879	254,176
4	Germany	133,275	130,227	156,888
5	France	96,440	97,282	106,449
6	Australia	74,496	81,281	110,928
7	United States	54,254	57,479	75,308
8	Maldives	95,167	79,371	76,108
9	Netherlands	41,373	51,148	57,160
10	Russia	58,176	59,191	65,497
	Total Foreign Arrivals	2,050,832	2,116,407	2,333,796

Table 3.1.2 Statistics from Wikipedia

The above table shows the number of tourist arrivals from foreign countries.

Since the number of tourist arrival is high we should provide better service or needed service. Developing a better trip guide will help most of the tourists from foreign countries and also for the people in Sri Lanka. Most of the people are using smart phones nowadays. So we should use new technologies in tourism as well.

3.2 Literature survey

As discussed in the above study, the tourism in Sri Lanka improved a lot and it is being developed more and more. Also, the issues and difficulties faced by the tourists and guides are also uncountable. To overcome all those issues, we have to use proper technology and proper features.

Before implementing a feature, we have to do a analysis on the products that are available in the market. Developing a product which is already there in the market is waste of time and energy. There are plenty of applications available in the market but most of them are providing same service. Analyzing the product in the market is very important to reduce this kind of issues.

Tour buddy is an application developed by students of SLIIT. This application has features like booking hotels and restaurants, location and navigation services, weather prediction service, budget calculation and automated trip plan. But this application doesn't have a feature to help blind people/ It doesn't have a facility to navigate tourists by voice commands. Even voice commands can help normal people as well.

Trip advisor is mainly developed to provide advises about trips. Also it helps to connect with tourist guides. This app is not useful when it comes to travelling.

Sri Lanka Travel Guide also known as Triposo is another travel guide application. It provides an offline map and also some details about the tourist places. It helps the tourists to find tourist places according to the rating provided by other users. It provides facilities to book hotels, restaurants and also it connects with travel guides. But it doesn't have features like cost management, time management.

Application we've planned to develop contains all the features which are not available in those applications. We are going to use artificial intelligence in many places to provide better service.

Functions	Our Application – Trip Assistant	Tour Buddy (SLIIT – Research Application)	TourPal	TripAdvisor	Tripomatic	Minube
Booking Facilities	✓	✓	✓		✓	✓
Location & Navigation	✓	✓	✓	✓	✓	✓
Weather Service	✓	✓				
Automated transaction management	✓					
Time management	✓					
Calculating Budgets	✓	✓			✓	
Automated tour plan	✓	✓				
Automated Image Analysis	✓					
Search prediction	✓					
Photo capturing and sharing.	✓					
Assisting Blind people	✓					

Table 3.2.1 Application comparison

3.3 Research gap

Most of the research applications regarding tourism have focused on the service which could be provided to tourist. There are plenty of tourist apps that are available for booking hotels, find the restaurant and find the travel agency.

The previous research project also contain some facility for tourist such as calculate tour budget, planning trip dynamically and find the tourist places in shortest route. But we have focused on some unique features like automated transaction management which automatically makes all the transactions to different places and to different people according the specification, time management which automatically calculates the trip time to all the tourist places according to the data provided by the tourist guides to each and every tourist places, automated image analysis which automatically find the details about the image which is taken in the tourist place, search prediction which automatically predicts the appropriate tourist place according the data collected by learning the user searches, photo capturing and sharing feature which allows users to pin a more realistic image in the tourist place and share them with other users according to the tourist permissions and assisting blind people feature helps blind people by giving them voice commands and also prevents them from hitting the obstacles.

3.4 Research problem

Nowadays tourism has become one of the major sources of Sri Lanka. There are many attractive tourist places cover the tourist but still they struggle to find the tourist places and tour guides.

There are some drawbacks impacting the tourism industry. When tourist search some places, they don't get any proper way to reach the destination and also they don't get better information regarding the places what they searched. At the time they might skip those places.

There are many apps to help tourist but it doesn't focus blind people. Blind people face difficulties to get shortest path to reach their destination. If the tourist wants to share the image among others they can share with privacy. There are most important fact to cover in the tourist app.

4 Objectives

4.1 Main objectives

This travel assistance system is facilitated with real time processed information. This proposed system will provide an automated tour plan according to the weather condition and also will give a booking facility. This system also provide a nearest tourist places and will also display the shortest path according to the traffic condition. This system also guides the blind people through the blind assistant system.

4.2 Specific objectives

In order to achieve main goals of travel assistance system following sub objectives need to be attained

- Collect the exact set of requirements in order to proceed the project plan
- Gather the exact set of parameters needed to find the real time weather condition.
- Gather the information of the important places and hidden places which will be needed to display via application.
- Implement user interfaces and system logics according to the system specifications.
- Create a database and store the tourist places description.
- Predict possible tourist places using artificial intelligence and base some factors.
- Create a database and store the physical guide information
- Create an algorithm to provide the shortest path
- Create an AR technology and store the images using specific database.
- Create the blind assistance system and provide the instruction which are stored in the database.
- Test and validate the application implemented and define that the application has been built according to the requirements gathered
- To initiate a business plan and introduce the solution to the market.

5 Methodology

This sector describes the architecture we are going use to design this whole system and what technologies are going to be used to implement this.

5.1 System overview

There are both web portal and mobile portal included in this tourist guide application. Users and tourist guides can register themselves to our application using the web application. User can use this web portal to manage their expenses, track travel history, check tourist places etc. Tourist guides can use web portal to register their fees and their charges.

Tourists can use mobile application to search tourist place and they can choose multiple tourist places which are in between the tourist and searched tourist place. Our system will predict possible tourist place using artificial intelligence based on some factors. Also, they can find restaurants, hotels, fuel stations on the possible shortest path. For each tourist place our system will provide weather information and also traffic details will be provided. Tourists can book restaurants and hotels using our application.

Tourists can choose one or multiple tourist guides according to their availability and rating. Even they will be able to choose a tourist guide per tourist place. Our system will calculate their charges and at the end of trip system will split the charges and pay each and evert tourist guide automatically.

Tourists can take photographs using augmented reality technology and they can share with other people. Our system will share photos publicly or privately according to their options.

This application has another function especially for those who don't have a physical tourist guide. The details of the pictures they take on tourist locations will be instantly casted to them on the screen. And also, we have included special technologies for blind people, which can be used by them as a voice activated Navigator map to locomote safely.

5.2 Functionalities

5.2.1 Predict tourist places

Our system will predict best suitable tourist places and list them in the search drop down list. We are going to use machine learning to sort search result according to various factors like previous search history, popular places for the season, weather etc. This will help tourists to find appropriate tourist place and this will give better experience.

5.2.2 Obstacle detection for blind people

Normally blind people can't visually sense their environment and detect the obstacles in their way of transportation. They usually use the blind stick to find out the obstacles in their path which is not precise every time, especially in the case of a moving object or person. This make them more vulnerable to accidents. To overcome this trouble this application includes an obstacle detection system for blind people. This system will use the camera and GPS of the smart phone of the blind user. The navigation mode will be automatically turned on after choosing the appropriate destination and navigation commands will be delivered as voice commands to the user. Furthermore, using the camera feature the obstacles will be detected time to time and user will be alerted and informed about the distance of the object and they type of object in case any obstacles are found inside the parameter of the user.

5.2.3 Image recognition

Using Image processing technology, pictures of monuments, shrines, tombs and other historically important things or interesting new elements in other tourist locations that are taken by the user on any will be processed and historical details or other special information about them will be casted to the user both as text and voice outputs. Updates of new tourist places also will be updated in regular time intervals so that the user can experience an updated environment.

5.2.4 Capturing and sharing images

Pictures taken on those places can be shared and stored using cloud technology by the users. These pictures will be displayed for another/same user in a later occasion when he/she points the exact same place using the application. This will be a great experience for the same user for reminding old memories and also people will be able to experience the same view of a celebrity using the application visited before.

5.3 Flow of the project

5.3.1 Requirement gathering and analysis

The vital part of a research project is the gathering and analysis part. Studying about the research area well before doing any further acts is more important. Clarifying whether the correct solution will be achieved using he proposed system is important before trying to implement it. A clear overview and understanding about the task and the necessary allocation strategies were recognized by the whole team as each members of the team gathered data from numerous sources.

The following are the methodologies that will be used to gather requirements.

- Studies on existing systems.
- Reading scholarly articles and industrial research papers.
- Reading online articles.

The industrial reports and research papers are one of the finest information source as those reports and papers will clearly give details on the bottleneck data in that particular project environment amidst the current technologies.

These gathering methods provided an obvious idea about the gap that exists between the current market available products and the proposed system. The next stage in this development process is analyzing all the gathered requirements. This is carried out carefully to eliminate all the misunderstandings on the proposed system. This is to ensure to get a clear and in-depth understanding regarding the limitation and barriers in the current proposed system. At the end of the analyzation the parts that need to be improvised in the management of this operation can be identified.

There is a need for including lots of new technologies from different areas. Hence, there might be a need of replacing some techniques proposed when it comes to practical applications or with the progress. The aim of the research is to find the optimal way for working out this idea into a tool with the current available technologies. At the end, there is a need to create system requirement specification and it will include all the functional and non-functional requirements of the tool. It is obvious that a perfect picture of the output of this tool cannot be predicted at this time as a research have a nature of fluctuating at any time and there might be a need for slight changes in the future.

5.3.2 Design

In this phase the requirement specification will be done, and a system design will be prepared according to that. By preparing a system design hardware specifications and system requirements can be specified. It will also help in defining the overall architecture of the system.

At the end of the phase, to confirm that the designs satisfy the previously mentioned requirements, a design and architecture review is conducted. For developing the next stage of the model, the design specifications of the system will be served.

Before implementing the design all the specified requirements will be converted into an appropriate form.

As an improper foundation for the system will not provide any proposed functions for the users, the design phase must be handled very carefully. Hence the necessary systematics related to the framework are explained using diagrams.

5.3.3 Implementation

At this phase implementation of the functions mentioned in the specified design and the system requirement specification will be done. Even though the implementation part will be driven as agile project the overall project will be done using the traditional waterfall method. This is because the priority must be given to the core framework and that should be developed necessarily in layer by layer way.

Further developments can't be done without developing the core part of the service framework. Hence, the core service framework will be developed first and then further move towards the component level will be done. The agile methodologies are chosen when developing the frameworks as when considering the core components, they can be built only in an iterative manner step by step. So, first a product backlog will be created, and then different tasks will be assigned to the team members according to their skills. This is to ensure that there will be an efficient allocation without no confliction among the members. So, the idea here is to develop the framework first such that there won't be any problems when the system is broken down into several components for individual persons.

After components are developed on top of the created framework further implementation are to be carried out. These implementation processes are aligned parallelly with the key areas that are mentioned above. Both the unit testing as well

as integration testing will be carried out during this implementation work as we have chosen agile environment for the implementation process.

5.3.4 Testing

- Unit Testing – The group individual who is developing the particular component will test himself that component and will ensure a unit of coding without any defects.
- Component testing - Testing each bug free units combinedly will be done in this stage. A repetition of test will be done after combining units from each individual.
- Integration testing- Users are responsible for testing in this phase to test whether the communication and associations between all the tested components are working as expected.
- System testing- The whole finished system will be tested for the verification of the functions and performance after all components from each individual member of the team is combined.

5.3.5 Ability of commercialization / potential for entrepreneurship

In a few years of time or after collecting necessary data from the user while they are using the application for the trip, pre suggestion of transport methods and accommodations can be given to users when they give their budget allocated to trips. Also, cheapest or luxurious way to enjoy a particular trip will be suggested when the places are selected. These can be done using machine learning techniques.

In the voice activated navigation system for blinds more safety instructions can be given. Instruction about magnitude and direction that the blind person has to move to avoid collision with the identified objects will be given.

There can be improvements in machine learning for identifying historical ruins. Identical historical ruins of the current ruin that is taken as picture can be shown.

Location details and current statuses also will be provided as additional information. This will be benefiting for researches and students to get more details easily. Public transport features can be added to the application so that it can decrease the expense of the traveler. The system will show the routes to reach the destination by different transportation modes such as bus, train, and private vehicles. If the user chooses to go by bus, the system will track the user's location and show the buses that the user should take, the nearest bus stop, bus fares, and the approximate time that will be taken to reach the destination. If the user chooses the train as the transportation mode, the system will provide with all the details the use such as nearest train station, the route to reach the nearest station to the location from the user's location, the train that should be taken, the ticket prices of each classes, and expected time to reach the destination. The system can also be linked to third party taxi booking applications like Pick Me and Uber.

The type of trip can be categorized like religious pilgrimages, family trip, honeymoon, educational tour and various other categories so that user can easily get suggestions and plan according to it. This can be further optimized by giving special events that comes under the category. For example, pilgrims will be instructed of special poojas and events related to them happening near them. Students doing educational trips can be informed of events like exhibitions, career fair and other special sales offered in near libraries. Also, they can be informed of field specialist or companies near them which will be a huge help for foreign students who are visiting another country.

Special events also can be informed to the users so that they can enjoy to their maximum and never miss any events when they are around. This feature is not only good for tourist but also good for everyone using the application. People can be always updated to the events and offers that are going around them. This will ensure that they won't miss any of the events that are pre-defined by the user. Movies and other special entertainment can be informed to the user, which he can get booking details in the app itself and also book and schedule vehicles for those events itself. So, it can be an all in one application with a tap go.

Furthermore, occasional and seasonal events and tourist places also can be informed for travelers. Obviously, there are sudden tourist attraction evolves when there a festival season comes up. For example, worlds building highest Christmas tree, world's largest Santa are famous in this era. They are suddenly evolving seasonal attractions. Those details can be shared to the user so that the user will not miss any of those events.

5.4 Tools and technologies

5.4.1 Tools

- Android
- Firebase
- Unity
- IDEs(Visual studio code, Android studio)
- GitHub

5.4.2 Technologies

- Angular
- NodeJS
- MongoDB
- MySQL
- Java
- Git
- Google APIs

5.5 Gantt chart

ID	Task Name	Duration	Start	Finish
1	**Trip Assistant**	248 day	Thu 06-12-18	Fri 15-11-19
2	**1.Topic Selection**	**41 days**	**Thu 06-12-18**	**Thu 31-01-19**
3	1.1Group Discussion	9 days	Thu 06-12-18	Tue 18-12-18
4	1.2 Feasibility Study	8 days	Thu 20-12-18	Mon 31-12-18
5	1.3 Analysing Topic	7 days	Tue 01-01-19	Wed 09-01-19
6	1.4 Analysing Scope	4 days	Wed 09-01-19	Sun 13-01-19
7	1.5 supervisor Topic-Acceptance	1 day	Mon 14-01-19	Mon 14-01-19
8	1.6 supervisor meeting	1 day	Wed 16-01-19	Wed 16-01-19
9	1.7 Project Topic Assessment	1 day	Thu 17-01-19	Thu 17-01-19
10	1.8 Chater Submissior	1 day	Thu 31-01-19	Thu 31-01-19
11	**2. Requirement Phase**	**33 days**	**Sun 03-02-19**	**Tue 19-03-19**
12	2.1 Requirement gathering	11 days	Mon 04-02-19	Mon 18-02-19
13	2.2 data Collection	20 days	Sat 16-02-19	Thu 14-03-19
14	2.3 Creating proposal Document	13 days	Tue 19-02-19	Thu 07-03-19
15	2.4 Supervisor Meetir	1 day	Sun 03-03-19	Sun 03-03-19
16	2.5 Project proposal Report	1 day	Tue 12-03-19	Tue 12-03-19
17	2.6 Proposal Presentation	5 days	Wed 13-03-19	Tue 19-03-19
18	**3. SRS**	**30 days**	**Tue 19-03-19**	**Mon 29-04-19**
19	3.1 Prepare SRS Document	26 days	Mon 18-03-19	Sat 20-04-19
20	3.2 submit Project Status Document	1 day	Mon 22-04-19	Mon 22-04-19
21	3.3 SRS progress Revie	4 days	Tue 23-04-19	Fri 26-04-19
22	**4. System development**	**102 days**	**Fri 15-03-19**	**Sat 03-08-19**
23	4.1 System developing	102 days	Fri 15-03-19	Sat 03-08-19
24	4.2 Progress Presentation i	3 days	Tue 18-06-19	Thu 20-06-19
25	4.3 Supervisor Meetir	1 day	Fri 14-06-19	Fri 14-06-19
26	4.4 Research Paper Submit	23 days	Sat 22-06-19	Tue 23-07-19
27	**5.Testing**	**21 days**	**Sun 04-08-19**	**Fri 30-08-19**
28	5.1 Component Testir	5 days	Sun 04-08-19	Thu 08-08-19
29	5.2 Integration Testin	8 days	Fri 09-08-19	Tue 20-08-19
30	5.3 System Testing	8 days	Wed 21-08-1	Fri 30-08-19
31	**6. closure of the Projec**	**44 days**	**Tue 02-07-19**	**Thu 29-08-19**
32	6.1 Final Report	25 days	Tue 02-07-19	Sun 04-08-19
33	6.2 Supervisor Meetir	1 day	Tue 20-08-19	Tue 20-08-19
34	6.3 Feedback Submission	1 day	Fri 23-08-19	Fri 23-08-19
35	6.4 Progress Presentation ii	3 days	Tue 27-08-19	Thu 29-08-19
36	**7. final Submission**	**53 days**	**Wed 04-09-1**	**Mon 18-11-19**
37	7.1 Website Assigment &	4 days	Wed 04-09-19	Sat 07-09-19
38	7.2 Supervisor Meetir	1 day	Sat 07-09-19	Sat 07-09-19
39	7.3 Final report & project Status	1 day	Mon 09-09-19	Mon 09-09-19
40	7.4 Viva & Presentatic	3 days	Wed 13-11-1	Mon 18-11-19

Figure 5.5.1 Word breakdown structure

6 Description of Personal and Facilities

6.1 Work break down structure

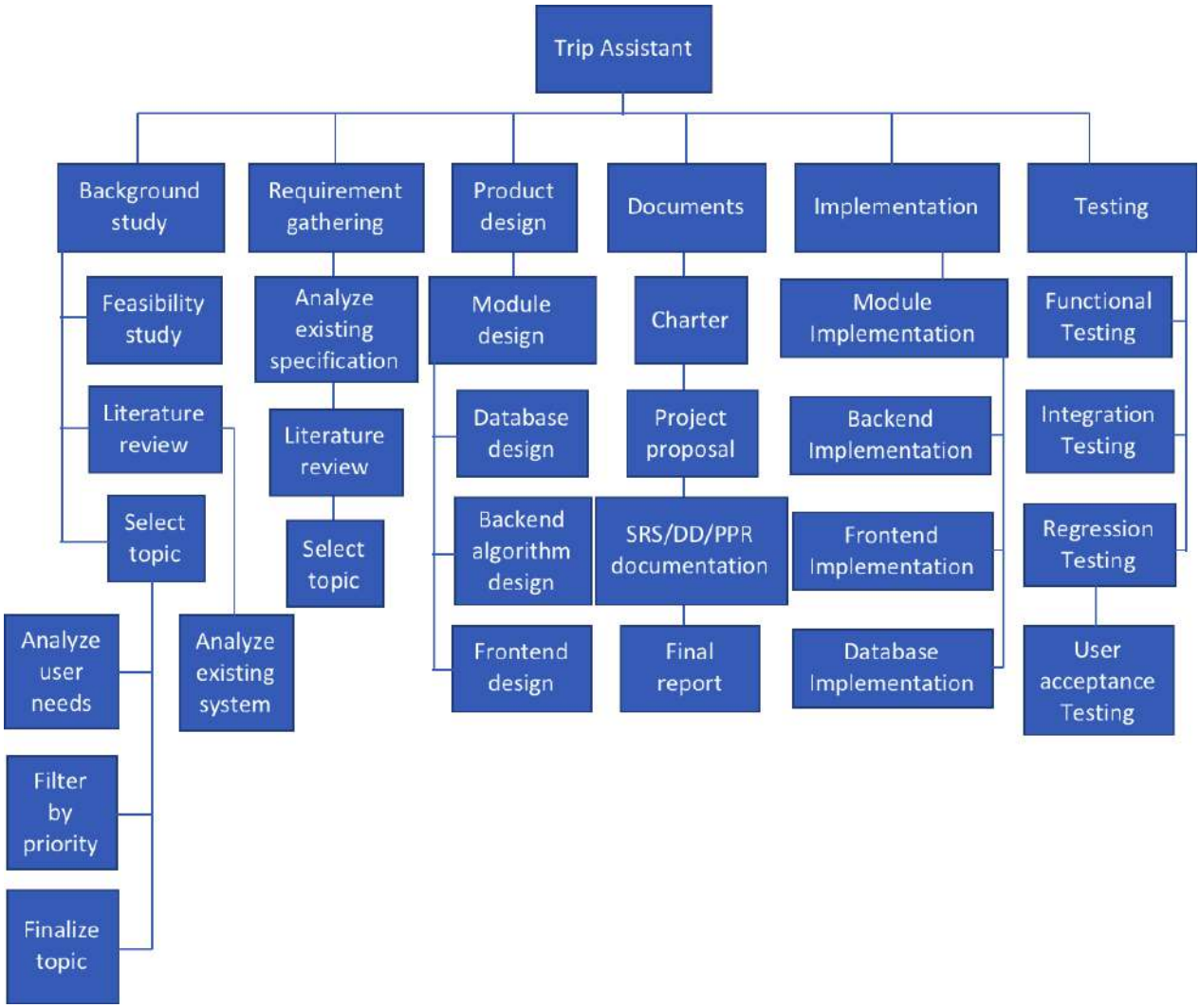

Figure 6.1.1 Word breakdown structure

Member	Component	Tasks
N Sankeethan	Prediction of tourist places	○ Do research on finding best algorithm to predict tourist places based on suitable factors in order to produce better prediction. ○ Predict and provide tourist places using the algorithm derived from research. ○ Documentation ○ Testing
J Vithusan	Assisting blind people by alerting before hitting obstacles	○ Do research on obstacles identification and distance calculation. ○ Find best algorithm to obstacles identification and distance calculation. ○ Do design to my algorithm ○ Implementation ○ Testing
P Sinthujan	Automatically detecting and giving information about the image taken in tourist places	○ Do literature survey on image understanding processing. ○ Gather necessary image of tourist place. ○ Data preparation and organizing data. ○ Processing the images and recognize the tourist places. ○ Generating text description and audio description for identified tourist place. ○ Documentation ○ Testing
Y Kirishajini	Capturing and share the images using AR technology and providing user privacy	○ Literature review ○ Documentation ○ System Design, integration and testing ○ Creating AR technology ○ Provide user privacy through the application

Table 6.1.1 Personal and facilities

7 Reference List

[1]. Sri Lanka Tourism Development Authority(SLTDA)

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