



Science

## MULTIMEDIA BASED SYSTEM FOR ‘AYURVEDA’ MEDICINE FOR THE NEXT GENERATION

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### Abstract

Traditional systems of medicines, including herbal medicines, have been used for many centuries for health care by people in South East Asia as well as in other parts of the world. Traditional medicine or Ayurveda medicine continues to be a valuable source of remedies that have been used by millions of people around the world to secure their health.

Sri Lankan Ayurveda has long history and is a popular medical system in Sri Lanka. Our present generation lacks the knowledge in medicinal plants based herbal drugs as well as indigenous medicine or Ayurveda natural home remedy medicine like previous generation.

Our main motivation is to save this valuable indigenous medicine system we develop for the next generation. The main features of the system are search facility, plant dictionary, video gallery including 3D animation, virtual tour and a report generator. The system *CeylonHerb* will bring indigenous medicine system to digital world as a multimedia based multilingual application.

**Keywords:** Indigenous Medicine; Ayurveda; Multimedia.

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### 1. Introduction

Traditional systems of medicines, including herbal medicines, have been used for many centuries for health care by people in South East Asia as well as in other parts of the world. Traditional medicine or Ayurveda medicine continues to be a valuable source of remedies that have been used by millions of people around the world to secure their health. It has been developed from empirical experiences and from observations made by people who use them. It embodies age-old wisdom and knowledge accrued over thousands of years, and forms an integral part of the social and cultural heritage of peoples and countries. The system has been inherited and handed down from one generation to the next by custom and tradition. [1][2]

Sri Lankan Ayurveda has long history and is a popular medical system in Sri Lanka. Our present generation lacks the knowledge in medicinal plants based herbal drugs as well as indigenous medicine or Ayurveda natural home remedy medicine like previous generation. The major reason is due to the knowledge transfer by word of mouth in generation to another generation. Few written books are also available in this area. Very few materials also could be found about Indigenous medicine or medicinal plants through Internet. Those materials are just written articles or few images or videos or static web sites. Not much information is provided for users in these articles and sites. [3][4]

Our main motivation is to save this valuable indigenous medicine system we develop for the next generation as a Sri Lankan citizen.

### **1.1. Project Objectives**

The objective of this project is bringing indigenous medicine system to digital world as a multimedia based web application. It includes Indigenous medicine or Ayurveda natural home remedy including medicinal plants detail by using multimedia.

### **1.2. Scope of Project**

The outcome of the project is a multimedia based web application that combines information and multimedia that has a user interactive digital library of indigenous medicine.

The Functionalities of the application is described below in brief.

- Mobile friendly Application
- Search Directory:
  - Facility to search plant using scientific or English or local name in search box
  - Facility to search by disease name in search box
  - Facility to directly get plant details using herbal directory in navigation menu.
- Voice search
- Web Administration
- Multimedia based features

This paper describes the design of a Multimedia Based System for 'Ayurveda' Medicine for the next generation.

## **2. Review of Current Similar Systems and Requirement Analysis**

There are very few of similar systems available in Sri Lanka. All of current websites focus only information with one or two images relating to a medicinal plant. One web site which includes large collection of medicinal plants database is described below.

### **2.1. Institute of Ayurveda and Alternative Medicine [3]**

The Institute of Ayurveda and Alternative Medicine was established by Barberyn to provide the institutional framework for the research, training and development work it wished to carry out to nurture and promote Ayurveda in Sri Lanka. Home page of the site is given below in Figure 1.

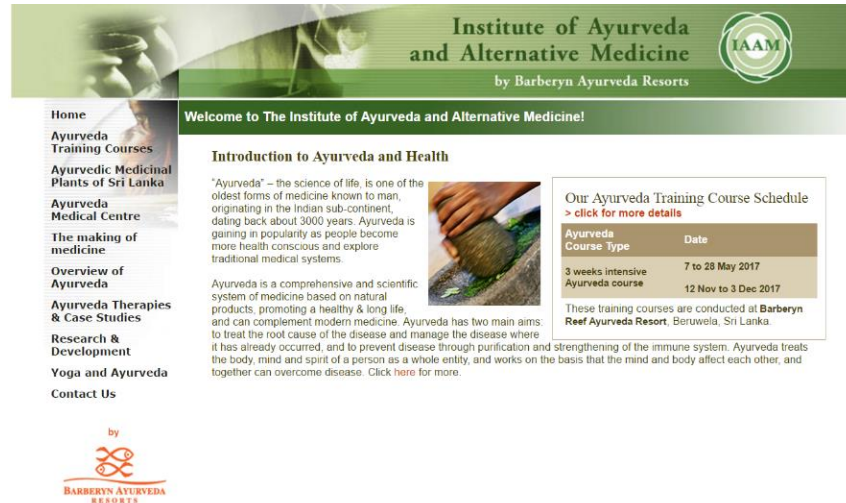


Figure 1: Home page of the Institute of Ayurveda and Alternative Medicine [3]

Web Page of Ayurveda medical plant directory found in the system is shown in Figure 2.

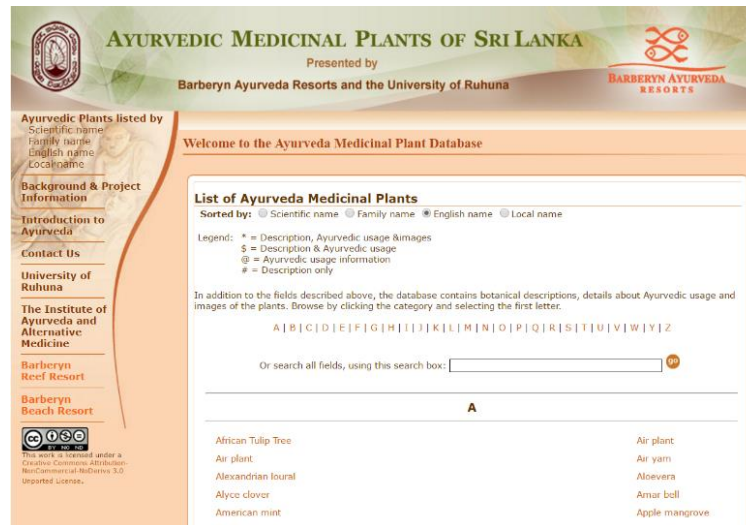


Figure 2: Ayurveda medical plant directory [3]

This site is just an information website and there are no multimedia based interactive features. This website includes a large collection of medicinal plants database. We could not find any multimedia based web site that will fulfill our intention. Two websites related to Ayurveda medicine were also looked at. [4][5]

## 2.2.Functionalities of the Required System

Use Case diagram for the required system is given in Figure 3.

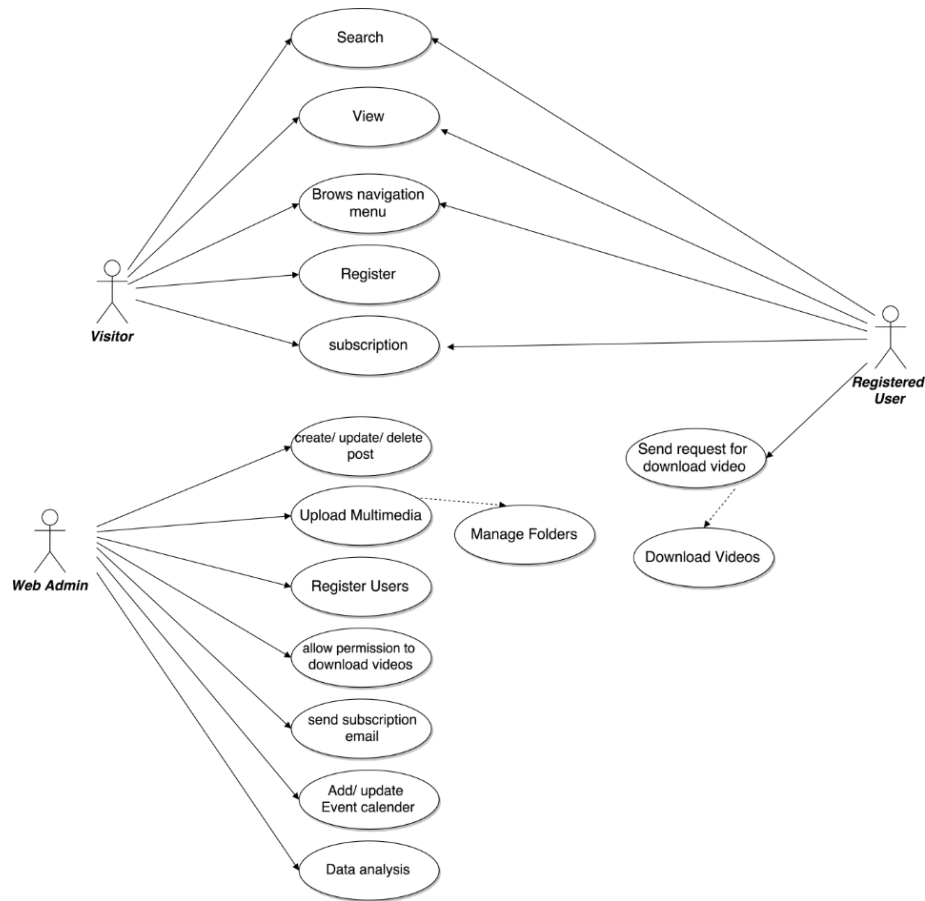


Figure 3: Use Case Diagram for the required system

Visitor, Register user and Web Admin are the three users of the system. Visitor and registered user have the same functionalities except the download video facility. Web admin is the main authorized person with full permission in this web application.

Top level navigation structure of the system is given in Figure 4.

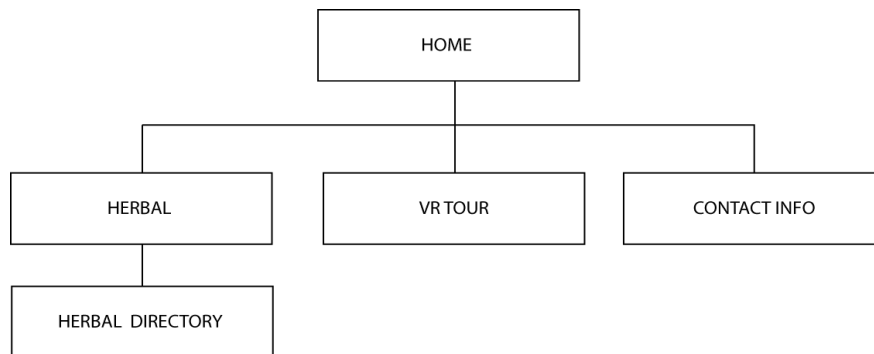


Figure 4: Top Level Navigation Structure

- **Search Engine functionality**

One of the important functions in the system would be the search function where user can search though in different ways.

*1<sup>st</sup> method:* User can search plant using *scientific* or *English* or *localname* in search box as given in Figure 5.

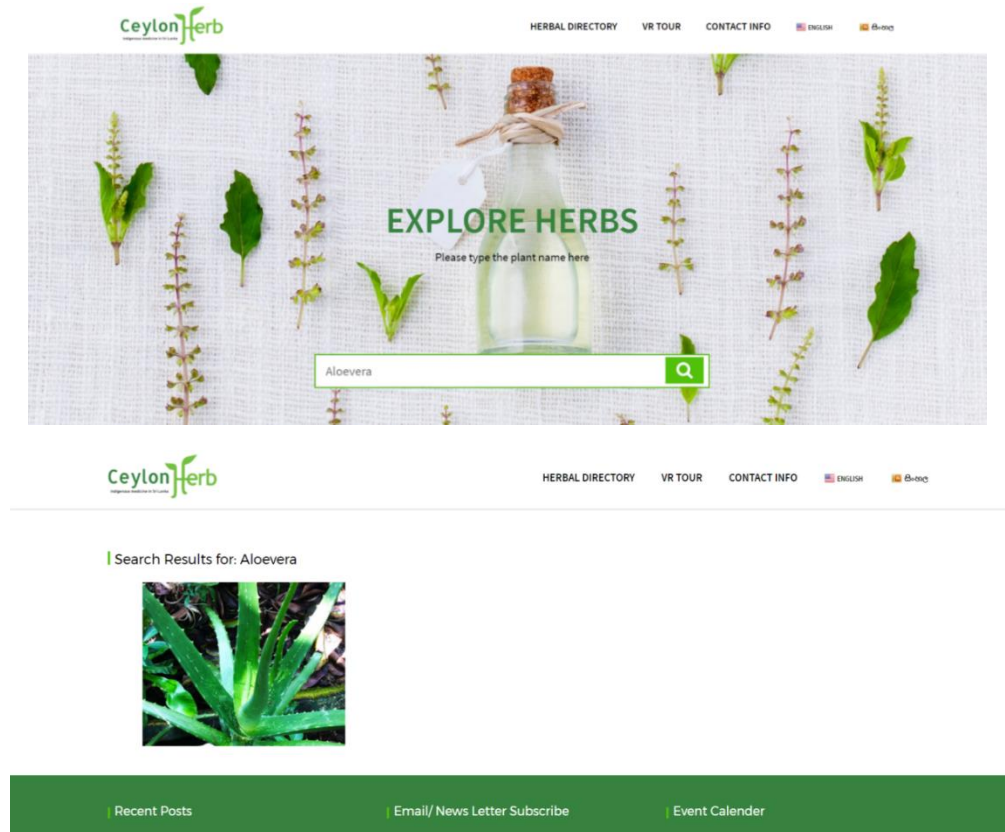
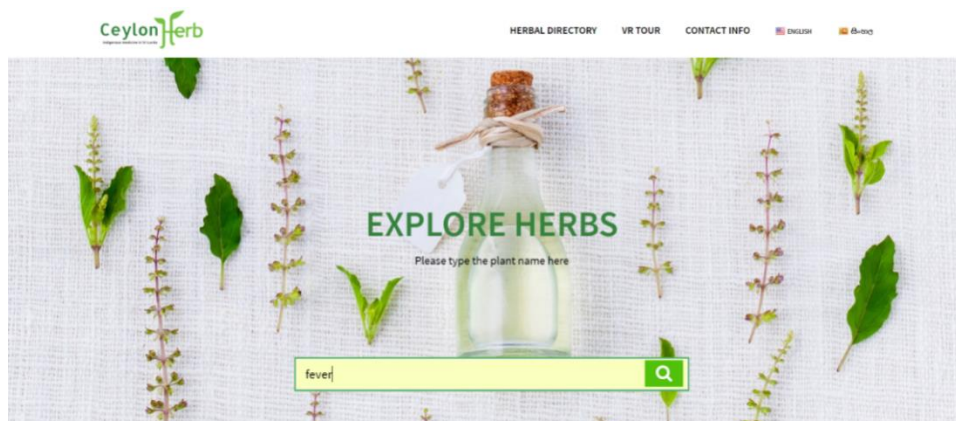


Figure 5: Search function

*2<sup>nd</sup> method:* User can search by *Disease* name using the search box. The alphabetical ordered plant names with the disease are listed as shown in Figure 6. Result page



Search Results for: fever



**Recent Posts**

- > Ginger - Inguru
- > Pomegranate tree - Delum
- > Chinese chaste tree - Nika
- > Long pepper - Thippili
- > Goose berry - Nelli

**Email/ News Letter Subscribe**

Name

Email \*

**Event Calendar**

March 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

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Figure 6: Another Search function -The alphabetical ordered plant names with the disease

• **Event Calendar Functionality**

The event calendar is a special feature in this web site. Web admin will update the calendar with all events from backend. Event calendar is shown in Figure 7.



Herbs with short, thick, branching subterranean stems. Leaves radical, 25-80 cm long, 3-10 broad at base, very fleshy, narrowly lanceolate, more or less flat axially, convex at the back, tapering to the apex and tipped by a spine, with distant spines along the margins. Inflorescences to about 110 cm tall; peduncle green, bearing few distant bracts. Flowers crowded, cernuous, bright orangish red. Capsule ovoid up to 1.5 cm long.

Grows in-southern Africa, Arabia, Sri Lanka, India, Morocco, Mauritania, Egypt, Australia, Barbados, Belize, Nigeria, Paraguay and the United States

Ayurvedic usage-Swelling, Burns, Skin diseases, Urinary disorders, Gastritis

Parts used to make Medicine-Leaves

Event calendar

**Recent Posts**

- > Ginger - Inguru
- > Pomegranate tree - Delum
- > Chinese chaste tree - Nika
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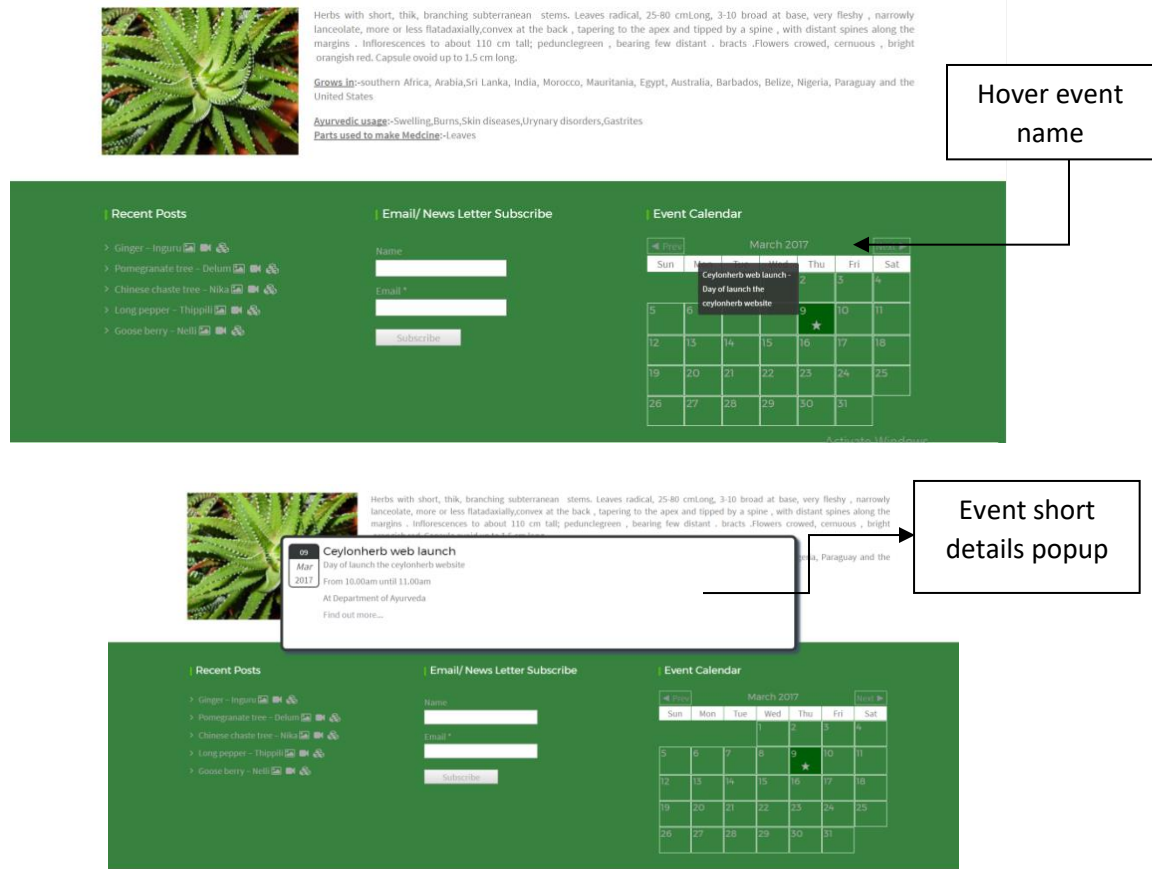


Figure 7: Event Calendar

Web administrator can add event to event calendar. User can get info about coming events regarding Ayurveda in advance by using this event calendar feature. They can even reserve places and get confirmation about attending seminars or events. This is a great feature for Ayurveda lovers in Sri Lanka or overseas.

- **E-mail Subscription**

The Email/ News Letter subscriber is a non-functional or soft goal of this web application. User only needs name and valid email address to subscribe the email/news letter. Subsequently, the system will send a confirmation email to the user and the user needs to confirm it.

- **Data analysis and Report generation**

Google analytic counter will be analyzed and give a detail report such as how many have used videos and how many have downloaded videos etc. This report can be printed or checked online by authorized people.

- **Multilingual (English/ Sinhala)**

Since this is a multimedia-based website for Sri Lankan indigenous medicine, majority of Sri Lankans would prefer to read the website using their mother language of Sinhala/Tamil language.

- **Backend Functionalities**

Administer tasks would be to upload multimedia contents, create posts, update event calendar, confirm email/news letter subscriptions and front-end UI updates. All the data will be saved in the database through this backend. All this task will be handled by an authorized person who does not need special technical knowledge to update the website through this backend.

### 3. Multimedia Features

- **Image Gallery**



Figure 8: Image gallery sample –Actual website

Every plant in the herbal directory have image gallery and it includes high quality resolution images as shown in Figure 8.

- **Video**

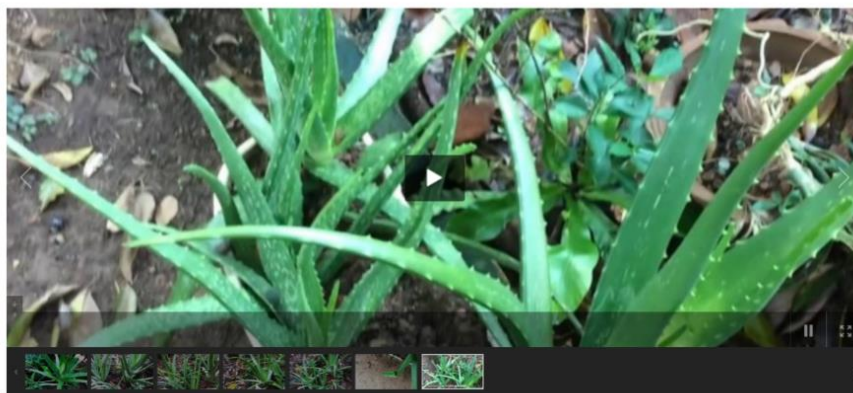


Figure 9: Video gallery sample

Figure 9 shows a sample of the video gallery of a medicinal plant. Videos are high quality and give full view of medicinal plants. Background narration can be shown with some of the most important and popular medicinal plants. The medicinal plants location is Department of Ayurveda and all video shots taken with permission.



- **3D animation**



Figure 10: 3D view of a Plant

The 3D view of a plant (Figure 10) shows how a plant looks in 3D view. Rendering medicinal plants took some time and may require high end hardware requirements to use this feature.

- **Virtual Reality Experience**

Figure 11 shows a screen shot of the VR (Virtual Reality) tour in this multimedia based web application.

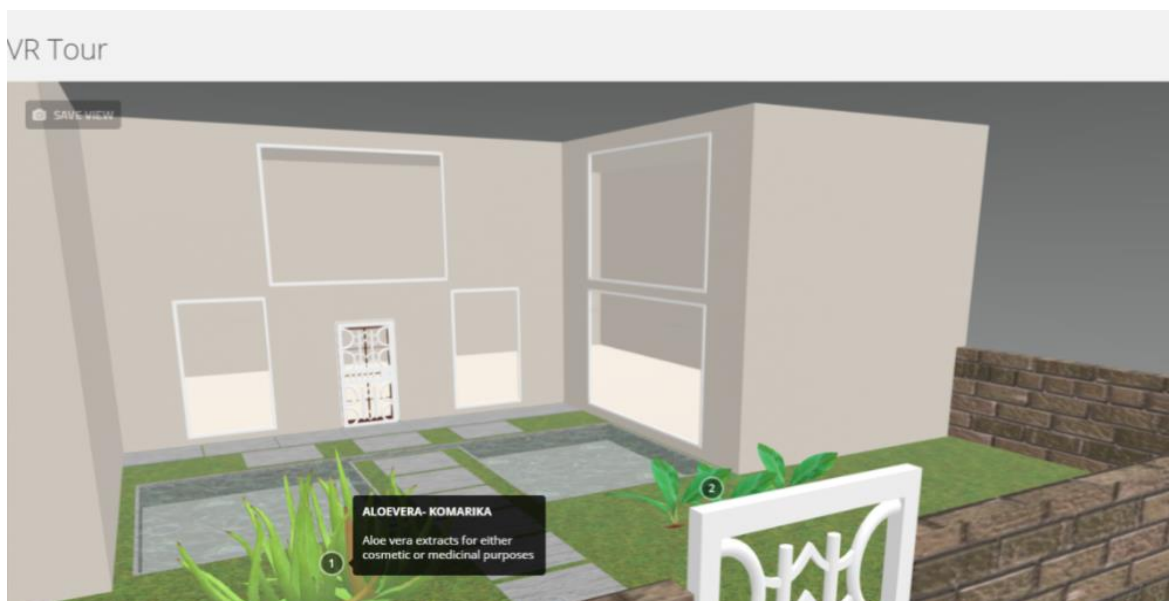





Figure 11: VR tour

Another example of the Image and Video gallery is shown in Figure 12 with technologies used.

**Herbal Name 01**   

**Image Gallery will be**

- 1. simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make torem Ipsum passag
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**Image Gallery will be**

1. Photography by author with using high quality DSLR camera
2. Edit in Adobe Photoshop, Davinchi code, light room
3. Save as web optimized high quality JPEG format
4. Front, top, angle view of plant photos

**3D view of plant will be**

1. Model in 3D studio Max
2. Animation
3. VR experinece

**Video Gallery will be**

1. Video by author with using high quality video camera
2. Edit in Adobe Premier, After Effects
3. Front, top and angle view of plant and description of plant will be include

**Usage will be**

Video or user interactive activity

**Tags:** category 01, category 02

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Figure 12: Screen shot taken from the image and video gallery

#### 4. Conclusion and Future Work

The indigenous medicine is one category in Sri Lankan Ayurveda and is popular in Sri Lanka. There are lots of written books, articles on newspapers about medicinal plants which are used in indigenous medicine. Although we live in digital era, only few materials could be found through internet about this medicinal plants. To fill up this gap we developed a multimedia based web application called “CeylonHerb”. The CeylonHerb website is not just information site. It’s an interactive multimedia featured website.

The “CeylonHerb” website includes medicinal plants with multimedia galleries, VR experience, search function, email subscription, event calendar and multilingual features. We could not find any online active website including all of these features. During testing and evaluation process users found the system really attractive and gave very good rating. There are some areas need to be improved and some features can be added. Furthermore current website herbal directory include only most popular medicinal plants. As recommend by users more medicinal plants need to be added.

The system CeylonHerb will bring indigenous medicine system to digital world as a multimedia based multilingual application.

##### 4.1.Future Work

Currently this website focuses only on most popular 10 medicinal plants. More medicinal plants info and multimedia galleries need to be added in future. Translations to Tamil language would also be incorporated in near future as well.

Current website is mobile friendly and separate mobile app will also be developed in future. It will combine VR tour plant code to identify plant and GPRS system will be used to find places of plant in Ayurveda garden.

#### References

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