suggestme

A Web Based Artist Search & Recommendation Application

(Technical Overview)

Version	Date	Author	Comments
0.1	08-Oct-2014	Nimish Bhonsale	Initial draft of the architecture overview

Contents

Introduction

The document provides an insight into the technical design decisions, technologies used, deployment overview and the steps to run the Suggest Me application. SuggestMe is a web based application deployed on Azure public cloud. It can be accessed using URL: http://suggestme.azurewebsites.net

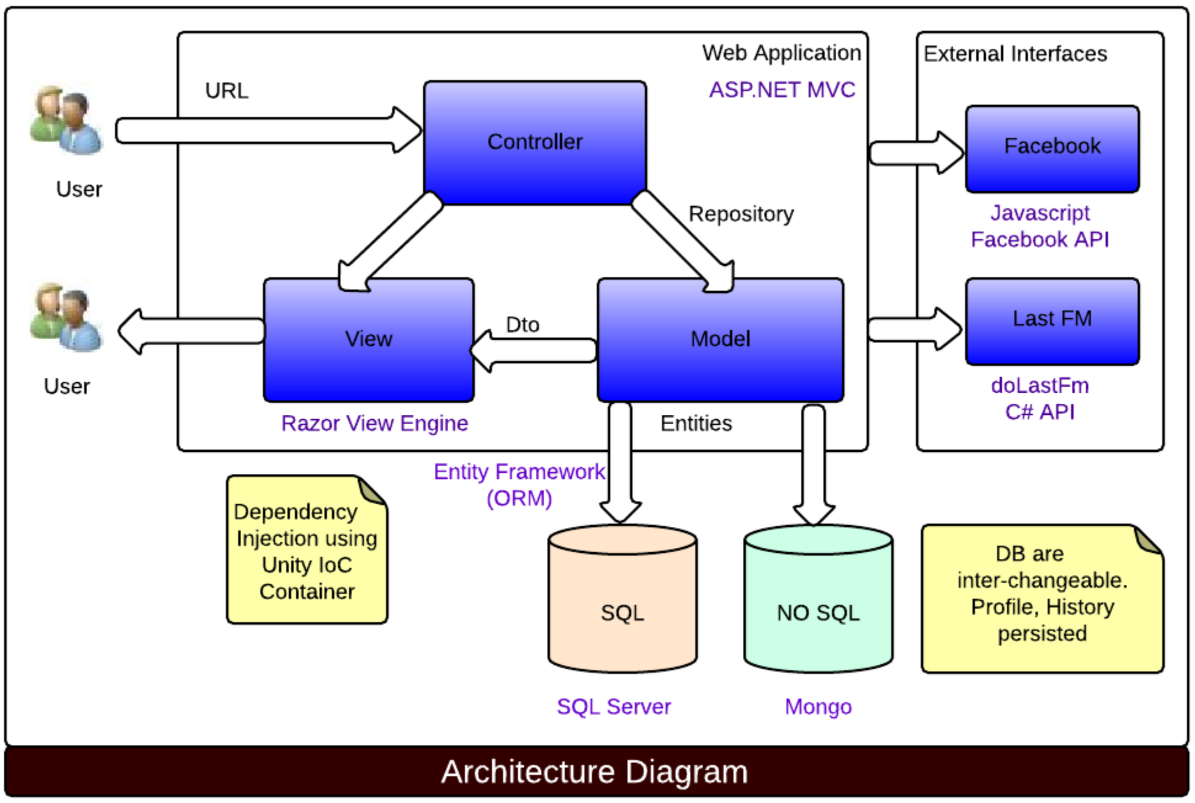
Key Design Decisions

The application architecture has following salient features:

- **Model-View-Controller architecture** pattern based on the principles of separation of concerns and provides loose coupling and testability.
- Further loose coupling and testability has been achieved using Dependency Injection achieved using **Unity IoC container**. A good example of this is flexibility to change database providers like Mongo and Sql Server.
- The implementation uses **Object Relationship Mapping (ORM)** in form of Entity Framework and a functional querying language **LINQ (Language Integrated Query)** that facilitates easy querying of the object collections.
- The design has been tested using **Nunit** (a library for unit and integration testing) and **Moq** (a library to provide mocks for real implementation) to verify the behaviors associated with the object.
- The user's profile (facebook identifier for now) is held in the database along with the search history associated with the user. This can be further scaled using in-memory cache.
- Session management is achieved using ASP.NET Session management. It can be further scaled using an out of process session persisted in SQL server or State server.
- Facebook's javascript API is used to isolate the login functionality from the remaining application.
- **LastFM .NET API** (REST based) is opensource and has been used (and enhanced) to meet the requirements.

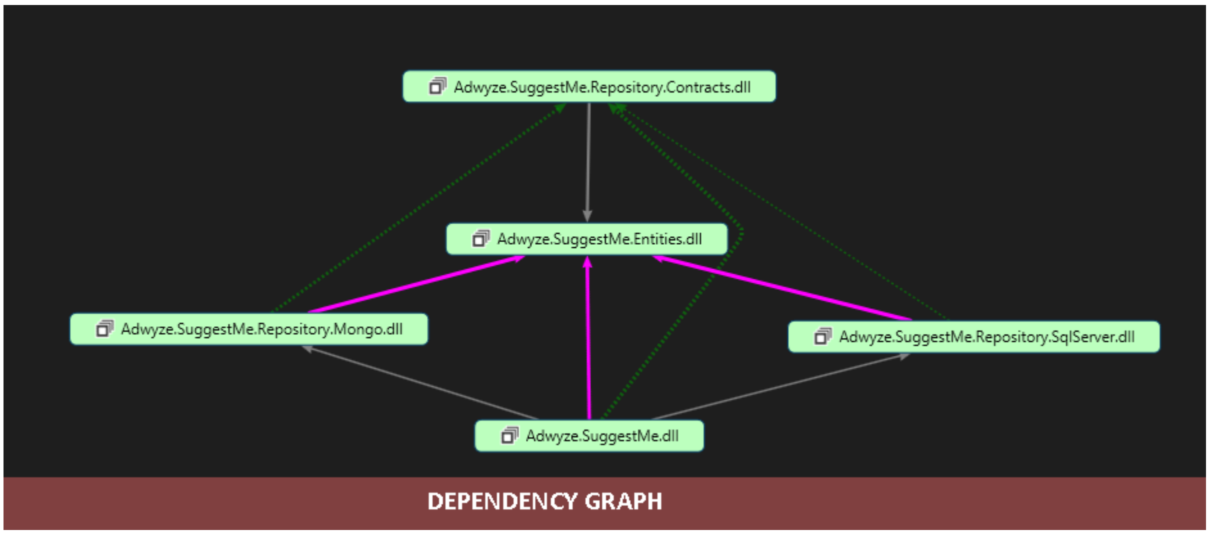
Application Architecture Overview

High Level Architecture

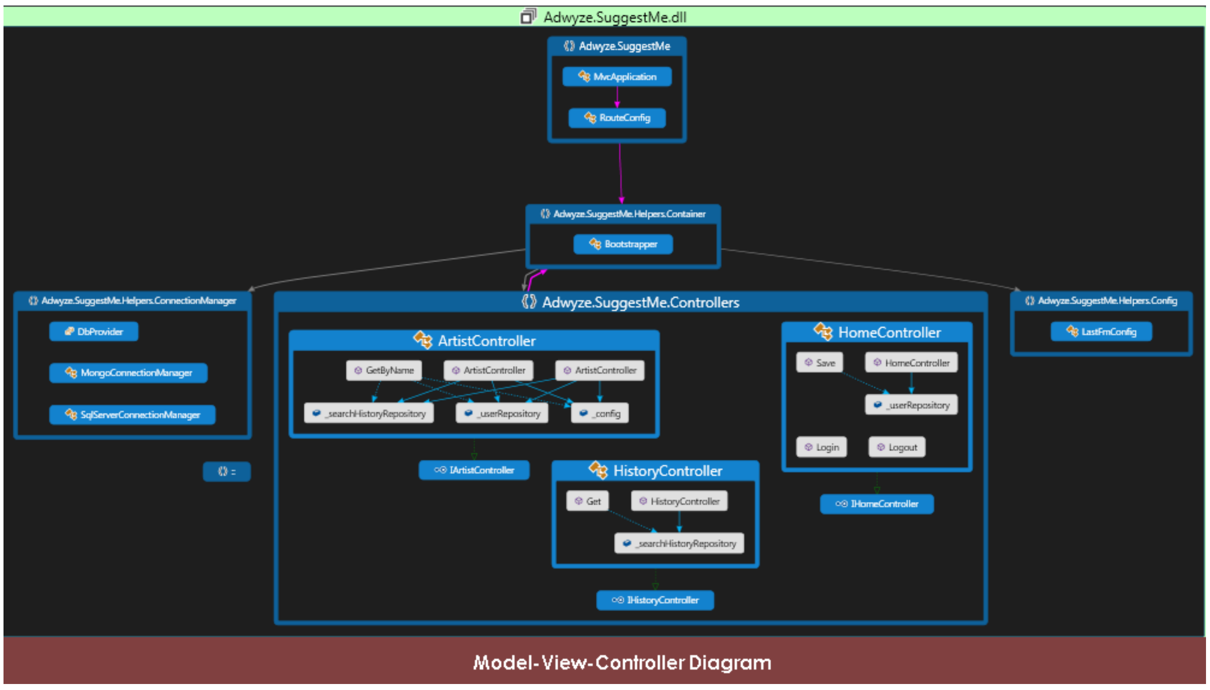


Low Level Architecture

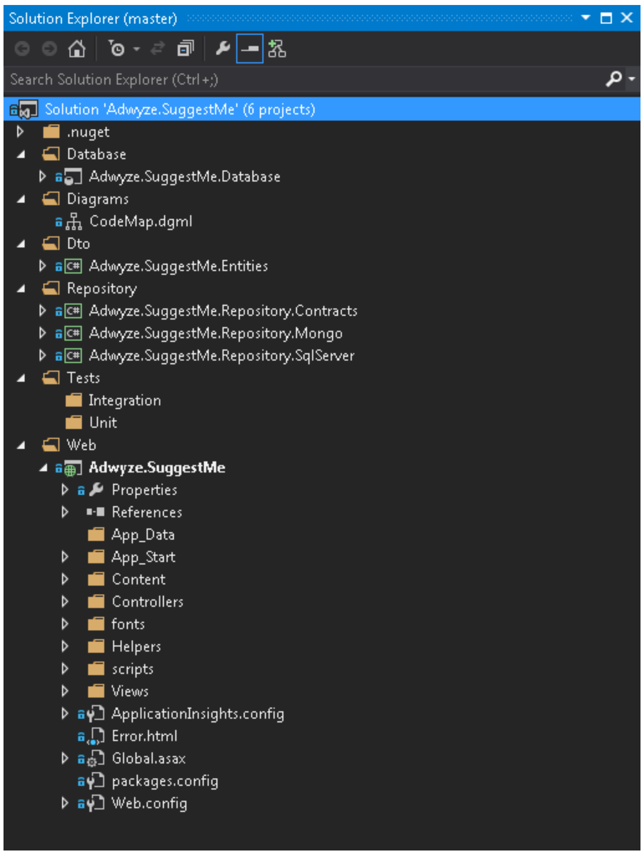
Dependency Graph


Adwyze.SuggestMe.Repository.Contracts.dll
Adwyze.SuggestMe.Entities.dll
Adwyze.SuggestMe.Repository.Mongo.dll
Adwyze.SuggestMe.Repository.SqlServer.dll
Adwyze.SuggestMe.dll
DEPENDENCY GRAPH

Web Application - MVC Diagram

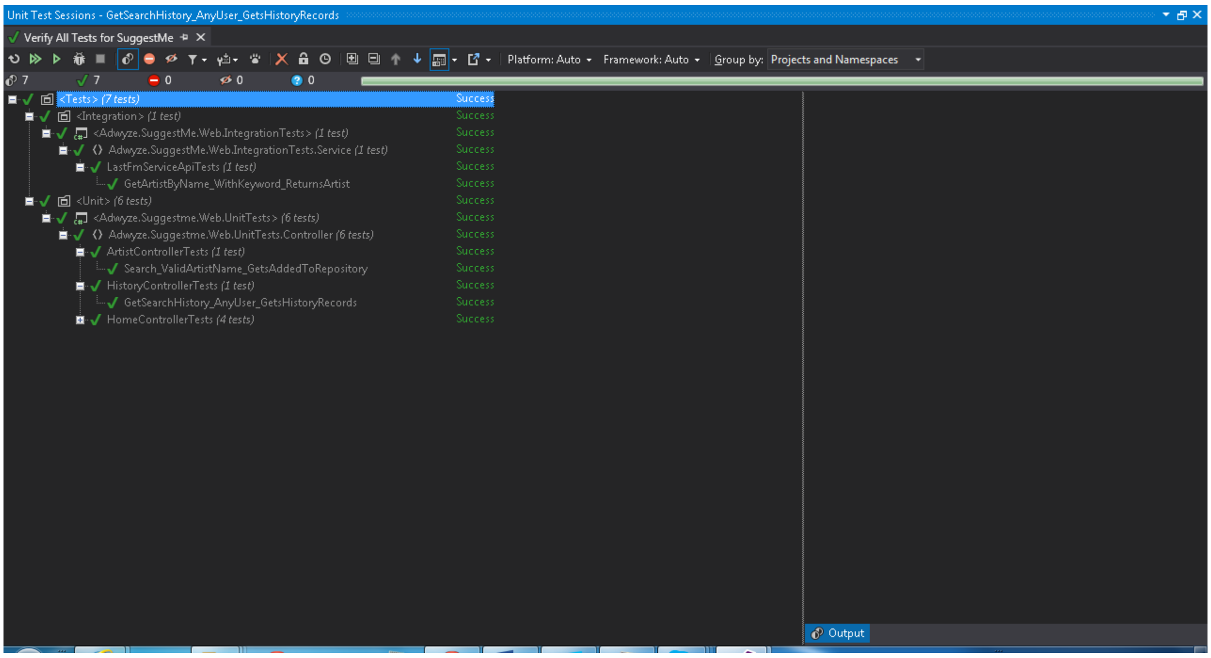


Code Solution Structure



```
Solution Explorer (master)
Search Solution Explorer (Ctrl+;)
Solution 'Adwyze.SuggestMe' (6 projects)
  .nuget
  Database
    Adwyze.SuggestMe.Database
  Diagrams
    CodeMap.dgml
  Dto
    Adwyze.SuggestMe.Entities
  Repository
    Adwyze.SuggestMe.Repository.Contracts
    Adwyze.SuggestMe.Repository.Mongo
    Adwyze.SuggestMe.Repository.SqlServer
  Tests
    Integration
    Unit
  Web
    Adwyze.SuggestMe
      Properties
      References
      App_Data
      App_Start
      Content
      Controllers
      fonts
      Helpers
      scripts
      Views
      ApplicationInsights.config
      Error.html
      Global.asax
      packages.config
      Web.config
```

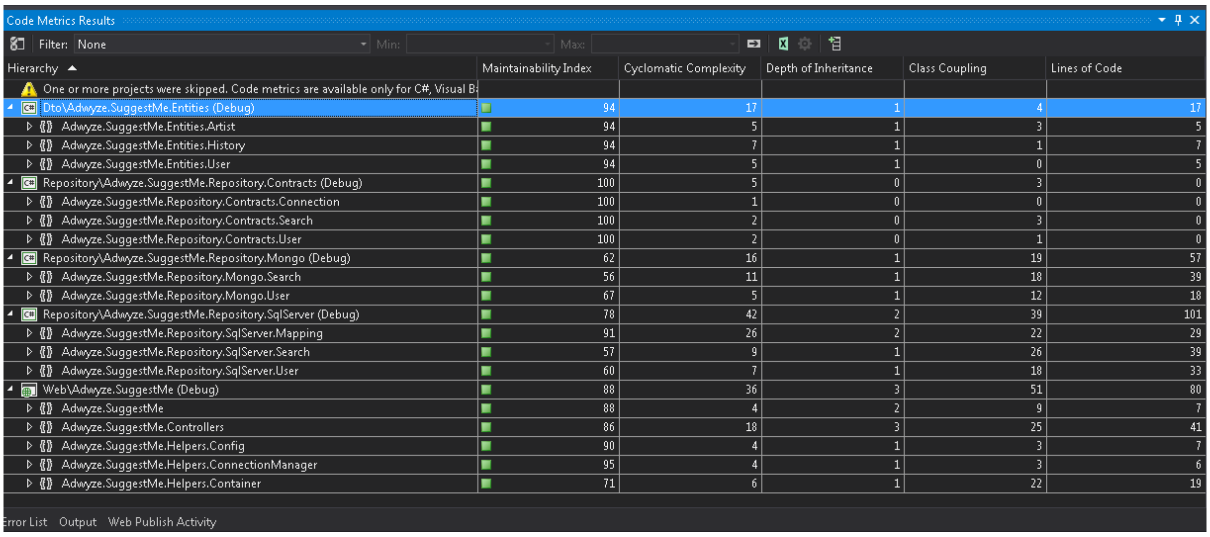
Unit & Integration Tests



```
Unit Test Sessions - GetSearchHistory_AnyUser_GetsHistoryRecords
Verify All Tests for SuggestMe
Platform: Auto   Framework: Auto   Group by: Projects and Namespaces
7   ✓ 7   0   0   0

<Tests> (7 tests)                                                     Success
  <Integration> (1 test)                                              Success
    <Adwyze.SuggestMe.Web.IntegrationTests> (1 test)                  Success
      Adwyze.SuggestMe.Web.IntegrationTests.Service (1 test)          Success
        LastFmServiceApiTests (1 test)                                Success
          GetArtistByName_WithKeyword_ReturnsArtist                   Success
  <Unit> (6 tests)                                                    Success
    <Adwyze.Suggestme.Web.UnitTests> (6 tests)                        Success
      Adwyze.Suggestme.Web.UnitTests.Controller (6 tests)             Success
        ArtistControllerTests (1 test)                                Success
          Search_ValidArtistName_GetsAddedToRepository                Success
        HistoryControllerTests (1 test)                               Success
          GetSearchHistory_AnyUser_GetsHistoryRecords                 Success
        HomeControllerTests (4 tests)                                 Success
```

Code Metrics



Code Metrics Results

Filter: None   Min: Max:

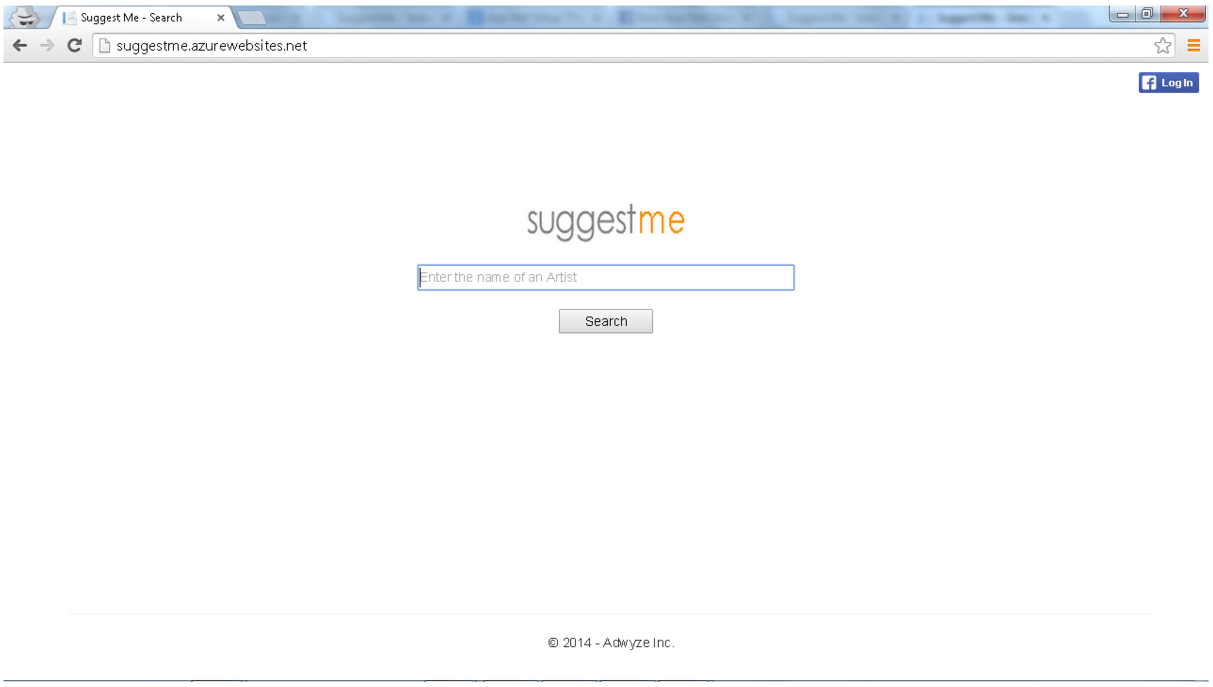
Hierarchy	Maintainability Index	Cyclomatic Complexity	Depth of Inheritance	Class Coupling	Lines of Code
One or more projects were skipped. Code metrics are available only for C#, Visual B					
Dto\Adwyze.SuggestMe.Entities (Debug)	🟩 94	17	1	4	17
Adwyze.SuggestMe.Entities.Artist	🟩 94	5	1	3	5
Adwyze.SuggestMe.Entities.History	🟩 94	7	1	1	7
Adwyze.SuggestMe.Entities.User	🟩 94	5	1	0	5
Repository\Adwyze.SuggestMe.Repository.Contracts (Debug)	🟩 100	5	0	3	0
Adwyze.SuggestMe.Repository.Contracts.Connection	🟩 100	1	0	0	0
Adwyze.SuggestMe.Repository.Contracts.Search	🟩 100	2	0	3	0
Adwyze.SuggestMe.Repository.Contracts.User	🟩 100	2	0	1	0
Repository\Adwyze.SuggestMe.Repository.Mongo (Debug)	🟩 62	16	1	19	57
Adwyze.SuggestMe.Repository.Mongo.Search	🟩 56	11	1	18	39
Adwyze.SuggestMe.Repository.Mongo.User	🟩 67	5	1	12	18
Repository\Adwyze.SuggestMe.Repository.SqlServer (Debug)	🟩 78	42	2	39	101
Adwyze.SuggestMe.Repository.SqlServer.Mapping	🟩 91	26	2	22	29
Adwyze.SuggestMe.Repository.SqlServer.Search	🟩 57	9	1	26	39
Adwyze.SuggestMe.Repository.SqlServer.User	🟩 60	7	1	18	33
Web\Adwyze.SuggestMe (Debug)	🟩 88	36	3	51	80
Adwyze.SuggestMe	🟩 88	4	2	9	7
Adwyze.SuggestMe.Controllers	🟩 86	18	3	25	41
Adwyze.SuggestMe.Helpers.Config	🟩 90	4	1	3	7
Adwyze.SuggestMe.Helpers.ConnectionManager	🟩 95	4	1	3	6
Adwyze.SuggestMe.Helpers.Container	🟩 71	6	1	22	19

GitHub Repository

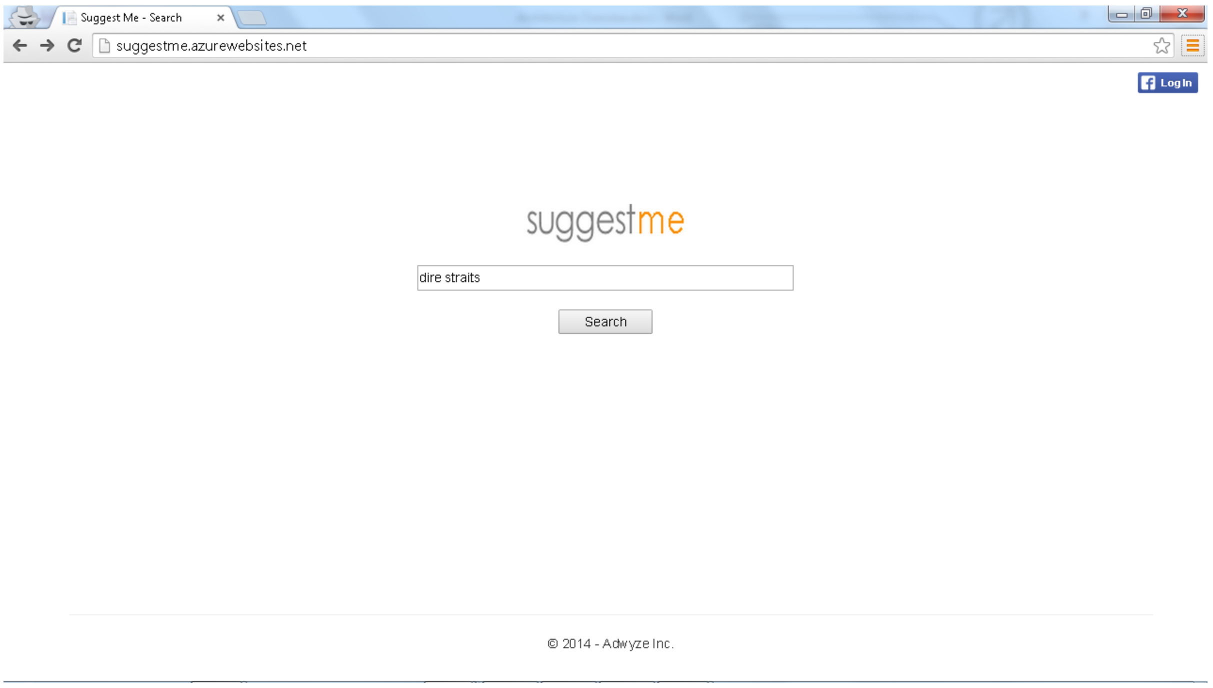
Code repository in Github: https://github.com/nimishbhonsale/adwyze-suggestme

Features & Usability

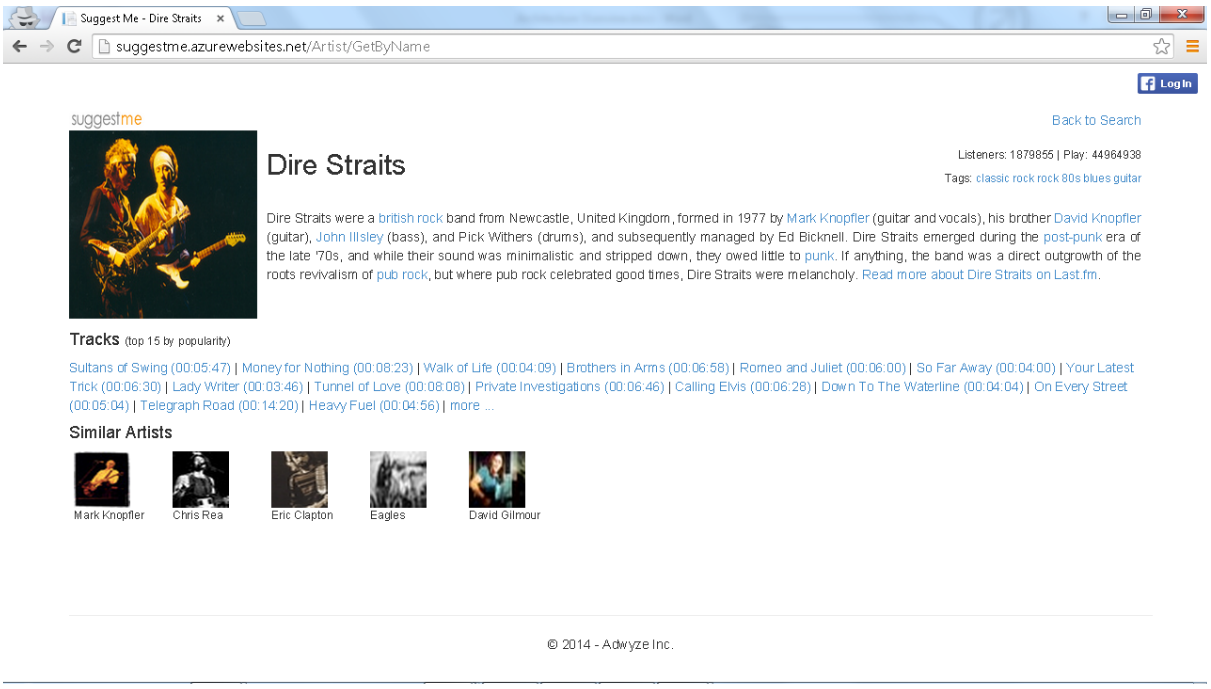
Ability for an anonymous user to search for artists. The user has an option to identify herself using a facebook login.



Anonymous User searches for an Artist (*dire straits* for example)



The search takes the user to the artist details which lists the brief summary, top 15 tracks for artist, tags, listerners and similar artists.


Suggest Me - Dire Straits
suggestme.azurewebsites.net/Artist/GetByName
Log In
suggestme
Back to Search

Dire Straits

Listeners: 1879855 | Play: 44964938

Tags: classic rock rock 80s blues guitar

Dire Straits were a british rock band from Newcastle, United Kingdom, formed in 1977 by Mark Knopfler (guitar and vocals), his brother David Knopfler (guitar), John Illsley (bass), and Pick Withers (drums), and subsequently managed by Ed Bicknell. Dire Straits emerged during the post-punk era of the late '70s, and while their sound was minimalistic and stripped down, they owed little to punk. If anything, the band was a direct outgrowth of the roots revivalism of pub rock, but where pub rock celebrated good times, Dire Straits were melancholy. Read more about Dire Straits on Last.fm.

Tracks (top 15 by popularity)

Sultans of Swing (00:05:47) | Money for Nothing (00:08:23) | Walk of Life (00:04:09) | Brothers in Arms (00:06:58) | Romeo and Juliet (00:06:00) | So Far Away (00:04:00) | Your Latest Trick (00:06:30) | Lady Writer (00:03:46) | Tunnel of Love (00:08:08) | Private Investigations (00:06:46) | Calling Elvis (00:06:28) | Down To The Waterline (00:04:04) | On Every Street (00:05:04) | Telegraph Road (00:14:20) | Heavy Fuel (00:04:56) | more ...

Similar Artists

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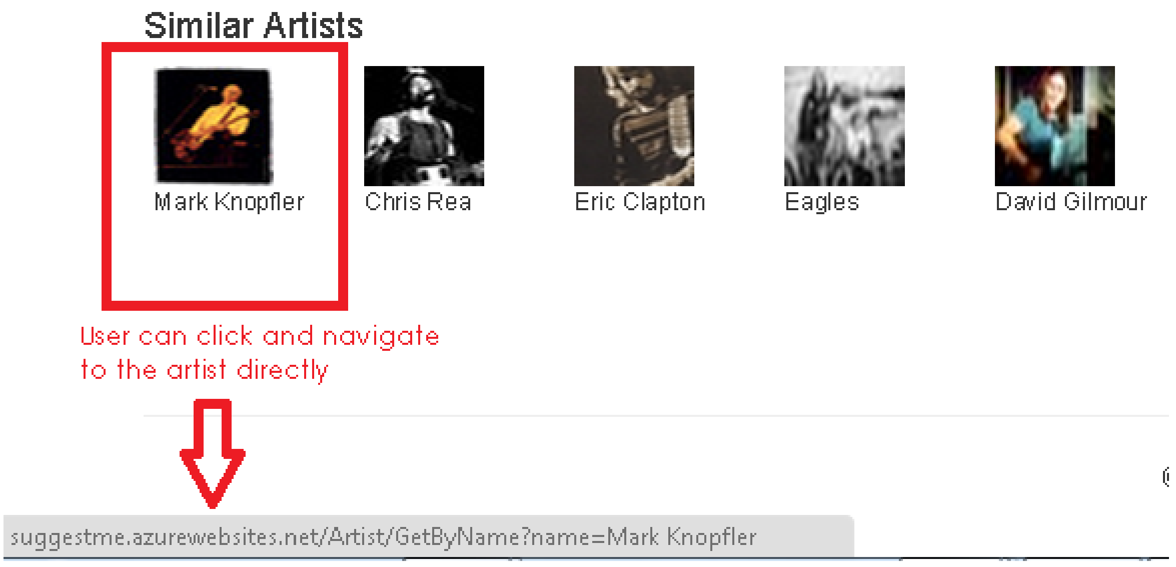
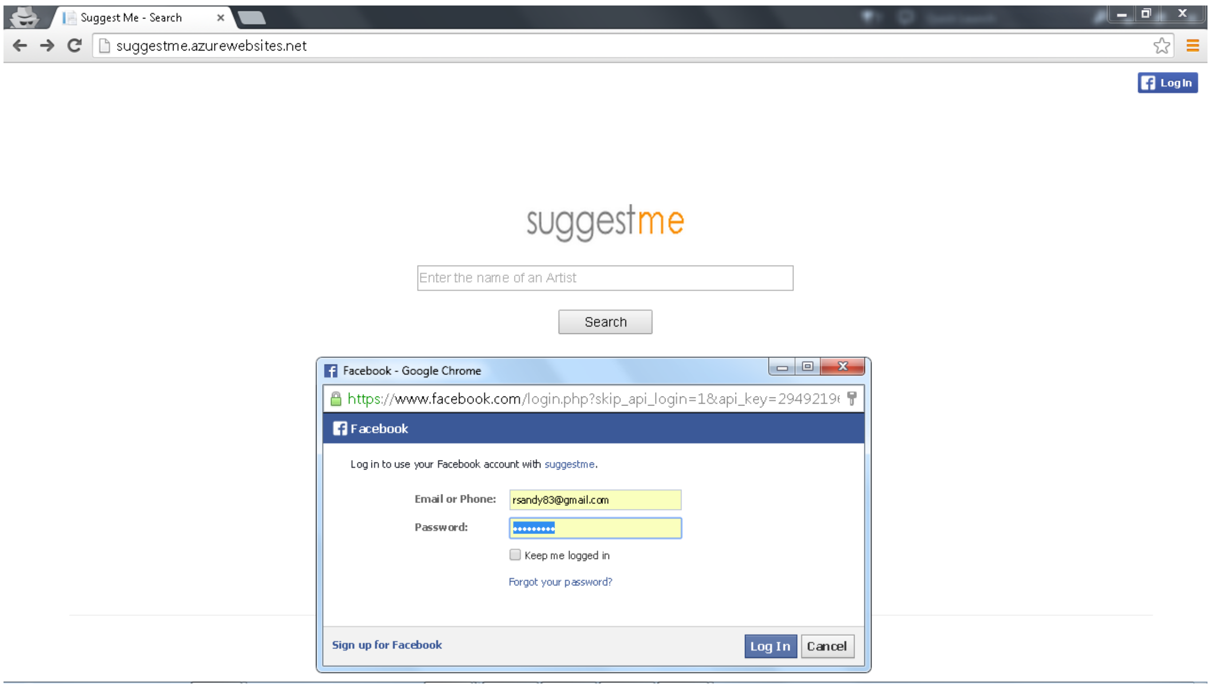
User can click and view details of Similar Artists

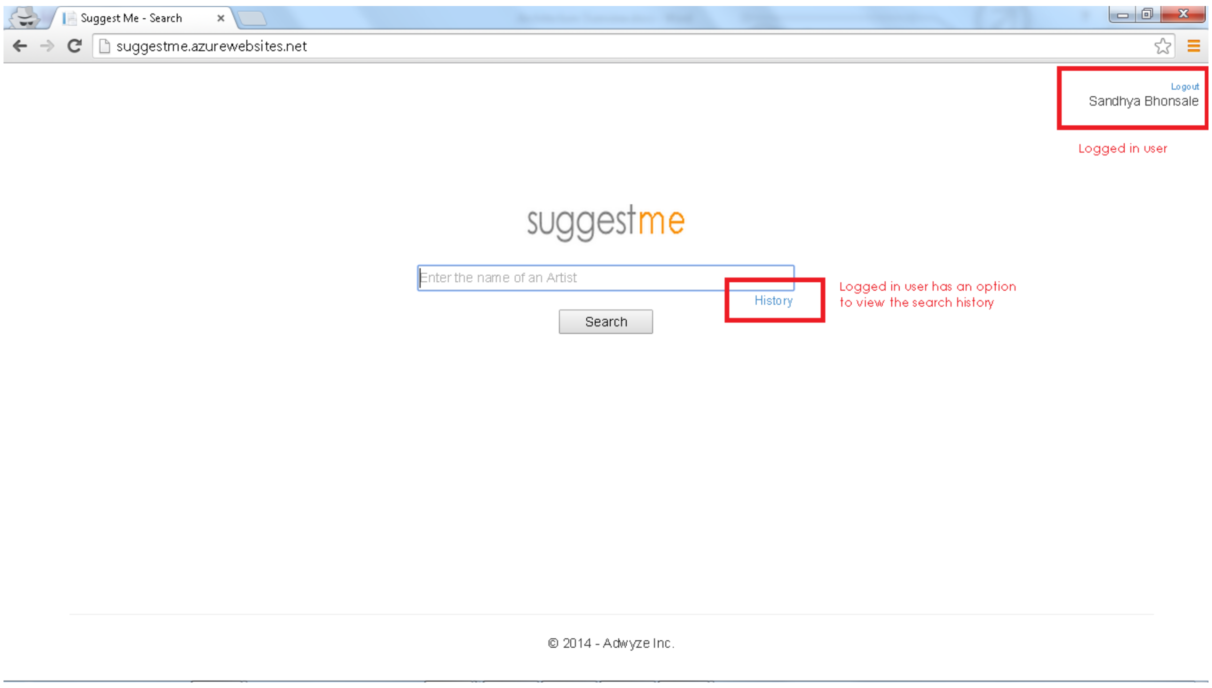

Similar Artists
Mark Knopfler
Chris Rea
Eric Clapton
Eagles
David Gilmour
User can click and navigate to the artist directly
suggestme.azurewebsites.net/Artist/GetByName?name=Mark Knopfler

User who wishes to identify herself logs in using facebook credentials. User clicks on Login and authorizes the application to validate on the user's behalf.



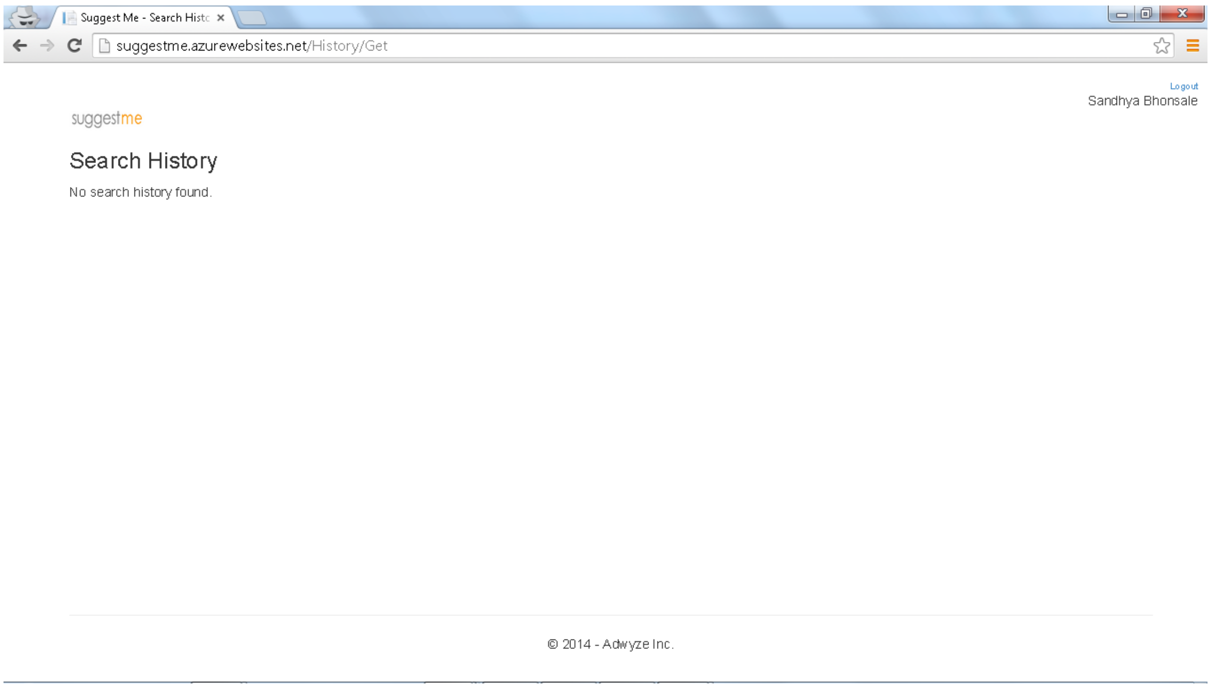
Suggest Me - Search
suggestme.azurewebsites.net
Log In
suggestme
Enter the name of an Artist
Search
Facebook - Google Chrome
https://www.facebook.com/login.php?skip_api_login=1&api_key=2949219
Facebook
Log in to use your Facebook account with suggestme.
Email or Phone: rsandy83@gmail.com
Password:
Keep me logged in
Forgot your password?
Sign up for Facebook
Log In
Cancel

Once the user logs in, the full name is displayed. She has an option to logout. The user can also see the search history.



Suggest Me - Search
suggestme.azurewebsites.net
Logout
Sandhya Bhonsale
Logged in user
suggestme
Enter the name of an Artist
History
Logged in user has an option to view the search history
Search
© 2014 - Adwyze Inc.

If there is no search history then the user will see the following screen


Suggest Me - Search Histo
suggestme.azurewebsites.net/History/Get

Logout
Sandhya Bhonsale

suggestme

Search History

No search history found.

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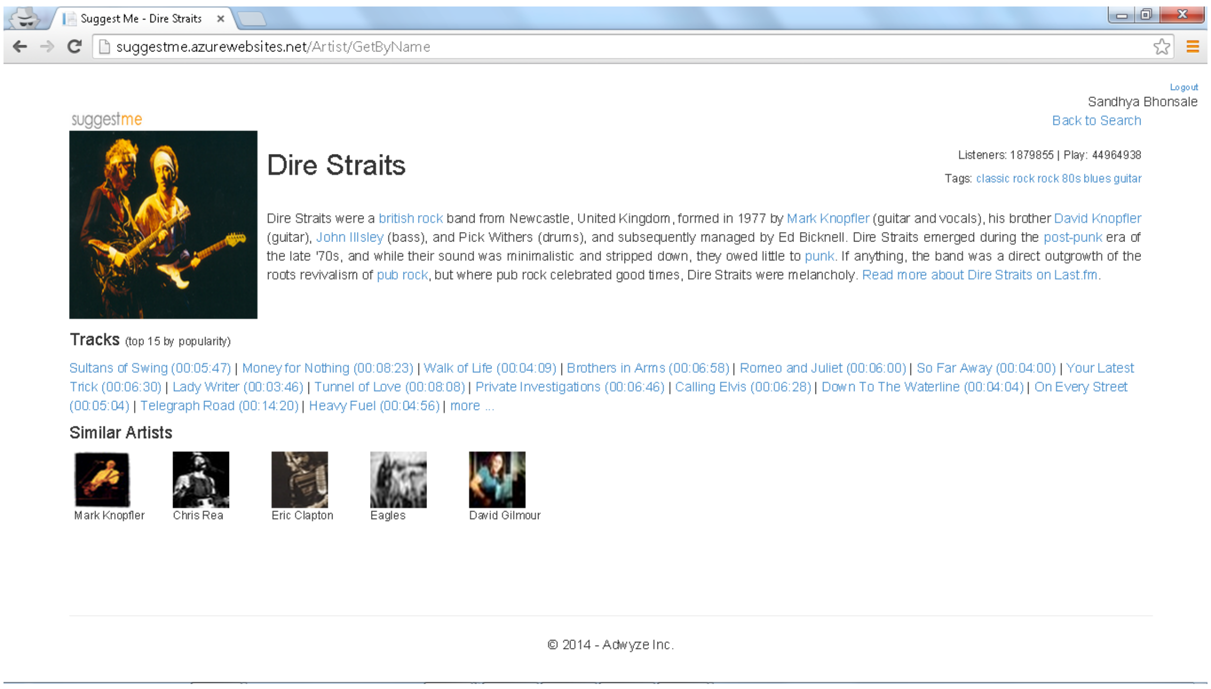
Once the user searches for an Artist (*dire straits* say), the artist details are displayed.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Similar Artists

Mark Knopfler
Chris Rea
Eric Clapton
Eagles
David Gilmour

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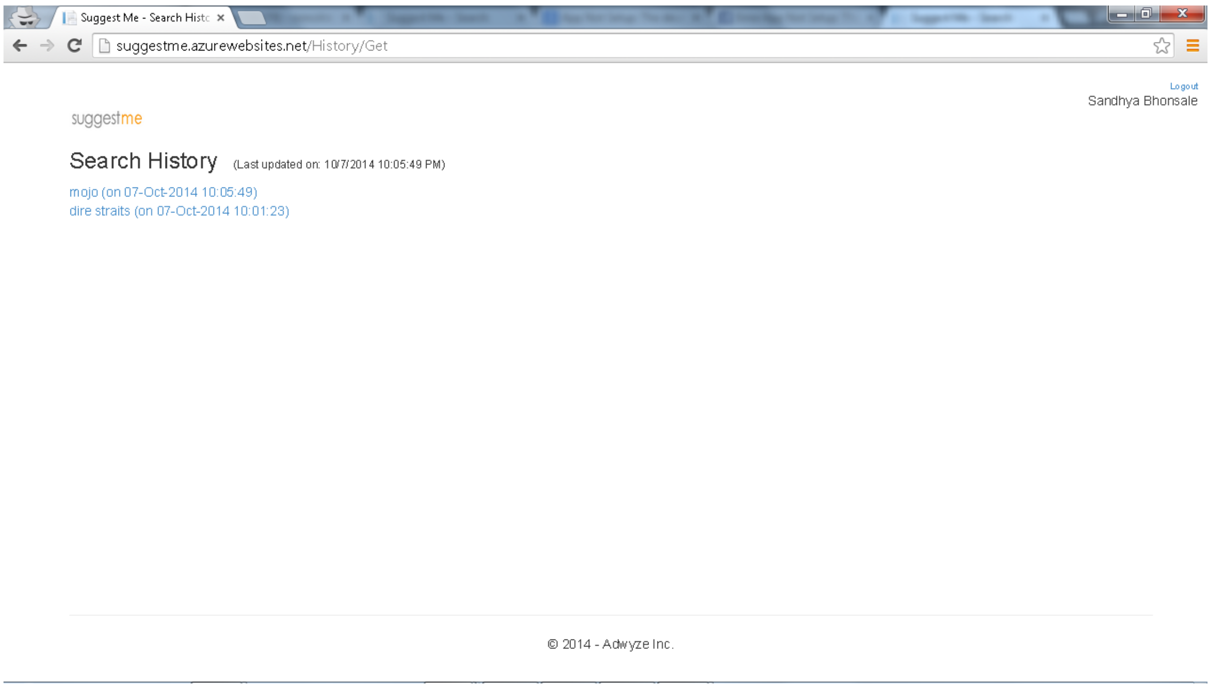
The Search History for the logged on user is displayed as shown below


Suggest Me - Search Histo

suggestme.azurewebsites.net/History/Get

Logout
Sandhya Bhonsale

suggestme

Search History (Last updated on: 10/7/2014 10:05:49 PM)

mojo (on 07-Oct-2014 10:05:49)
dire straits (on 07-Oct-2014 10:01:23)

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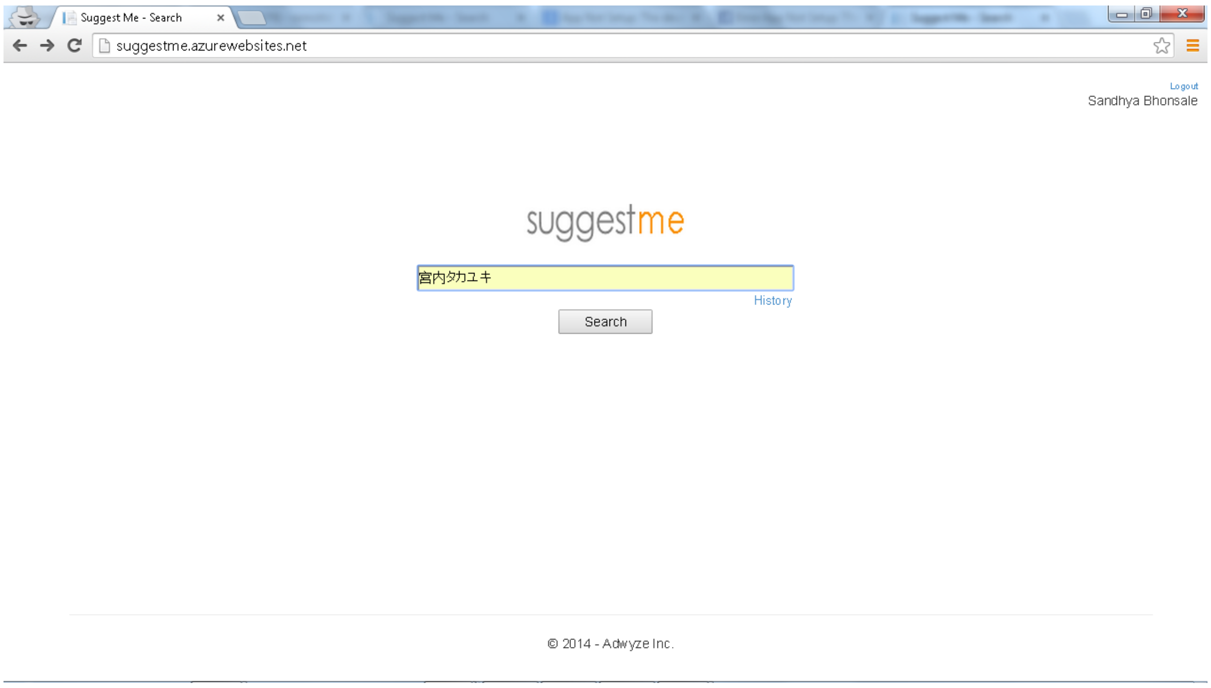
Unicode characters are supported in search (for example Japanese/Chinese texts). Search for an Artist 宮内タカユキ yields the Artist details


Suggest Me - Search

suggestme.azurewebsites.net

Logout
Sandhya Bhonsale

suggestme

宮内タカユキ

History

Search

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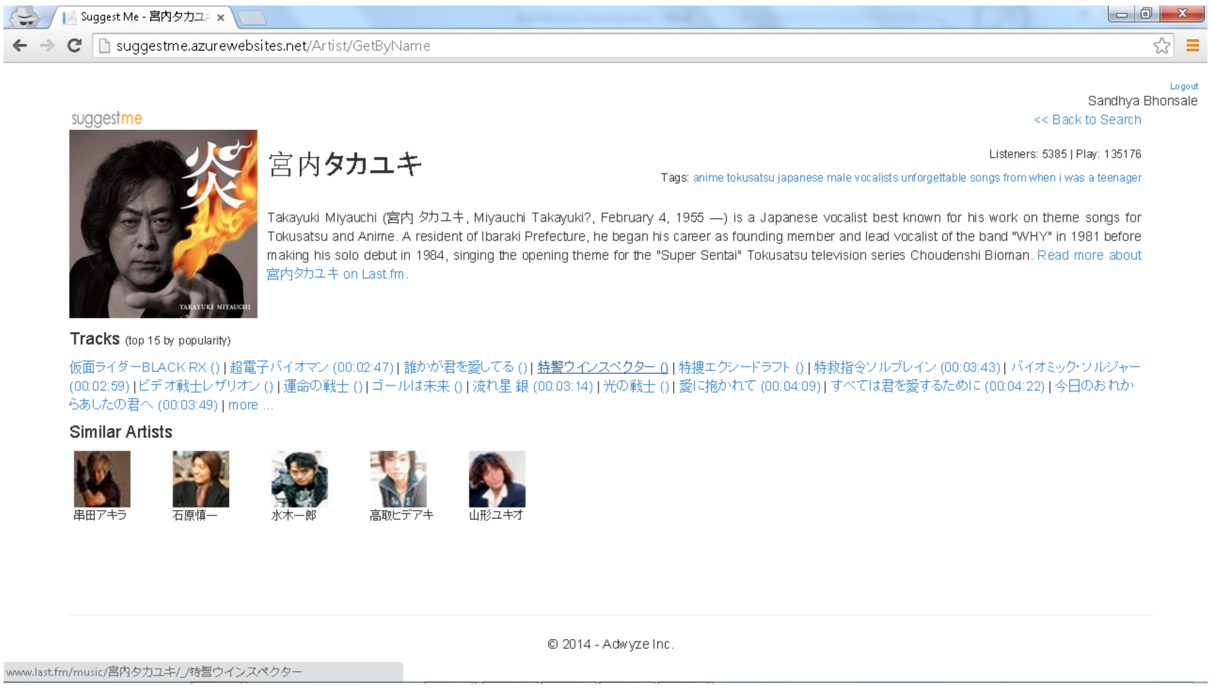
The Artist details display the unicode charaters


Suggest Me - 宮内タカユ

suggestme.azurewebsites.net/Artist/GetByName

Logout
Sandhya Bhonsale
<< Back to Search

suggestme

宮内タカユキ

Listeners: 5385 | Play: 135176

Tags: anime tokusatsu japanese male vocalists unforgettable songs from when i was a teenager

Takayuki Miyauchi (宮内 タカユキ, Miyauchi Takayuki?, February 4, 1955 —) is a Japanese vocalist best known for his work on theme songs for Tokusatsu and Anime. A resident of Ibaraki Prefecture, he began his career as founding member and lead vocalist of the band "WHY" in 1981 before making his solo debut in 1984, singing the opening theme for the "Super Sentai" Tokusatsu television series Choudenshi Bioman. Read more about 宮内タカユキ on Last.fm.

Tracks (top 15 by popularity)

仮面ライダーBLACK RX () | 超電子バイオマン (00:02:47) | 誰かが君を愛してる () | 特警ウインスペクター () | 特捜エクシードラフト () | 特救指令ソルブレイン (00:03:43) | バイオミック·ソルジャー (00:02:59) | ビデオ戦士レザリオン () | 運命の戦士 () | ゴールは未来 () | 流れ星 銀 (00:03:14) | 光の戦士 () | 愛に抱かれて (00:04:09) | すべては君を愛するために (00:04:22) | 今日のおれから あしたの君へ (00:03:49) | more ...

Similar Artists

串田アキラ 石原慎一 水木一郎 高取ヒデアキ 山形ユキオ

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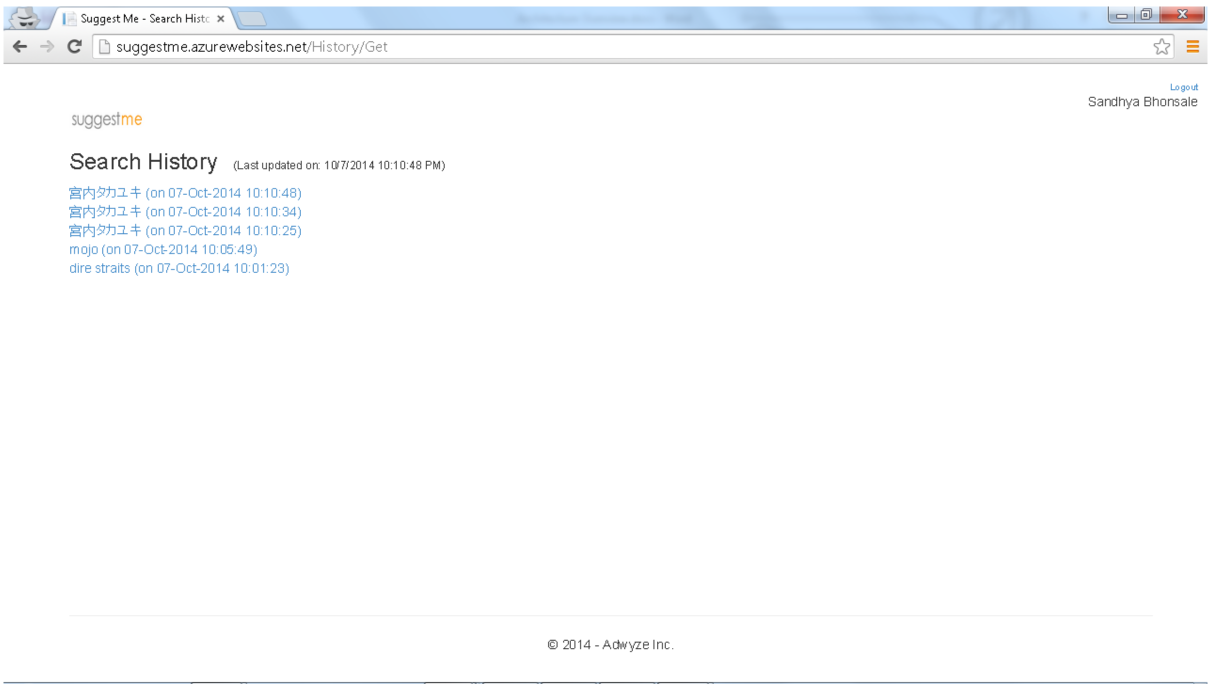
www.last.fm/music/宮内タカユキ/_/特警ウインスペクター

The search history displayed the unicode charaters


Suggest Me - Search Histo

suggestme.azurewebsites.net/History/Get

Logout
Sandhya Bhonsale

suggestme

Search History (Last updated on: 10/7/2014 10:10:48 PM)

宮内タカユキ (on 07-Oct-2014 10:10:48)
宮内タカユキ (on 07-Oct-2014 10:10:34)
宮内タカユキ (on 07-Oct-2014 10:10:25)
mojo (on 07-Oct-2014 10:05:49)
dire straits (on 07-Oct-2014 10:01:23)

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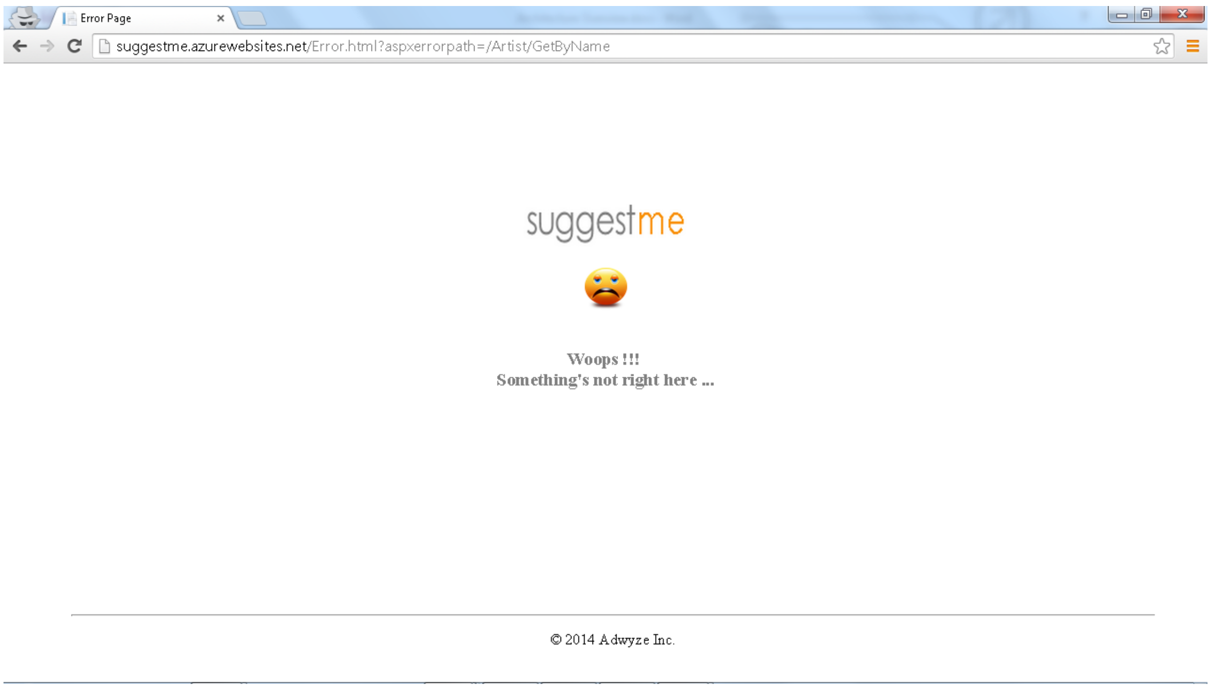
For any unhandled errors the user will be re-directed to an global error handler in form of an error page


Error Page
suggestme.azurewebsites.net/Error.html?aspxerrorpath=/Artist/GetByName
suggestme

Woops !!!
Something's not right here ...

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