

## **Support Document**

In the following pages, this section primarily gives the instructions on the installation of Smartstatis. This includes the application architecture, the choice of technologies used in Smartstatis and how each component communicates with the others in the application architecture.

Most of the services for the application backend which Smartstatis utilizes are from Amazon AWS. There are several reasons why it is recommended to choose AWS services for the application.

### **1. Easy to Set up**

AWS provides cloud MySQL database for the developers to setup the database easily as well as API Gateway which the developers can then setup the API platform for data retrieval. This leads to great convenience that the developers do not concern about the choices of application backends and the platform for the data API.

### **2. Scalable**

It takes no effort if the developers decide to scale up your databases compute and storage resources. Rather than worry about the physical capacities of the resources, it only takes the click of a button to scale up the resources, and a most of the time this doesn't even involve any downtime.

### **3. Secure**

Controlling network access to the database is quite easy with RDS. Amazon Virtual Private Cloud is used to run databases instances, this means the network can be accessed through an encrypted VPN, and also this allows the developers to isolate the database instances.

### **4. Inexpensive**

With RDS you only pay as you go, and the rates charged are considered to be quite low. Along with this, the On-Demand pricing is very beneficial, and there is no up-front costs or long-term commitments.

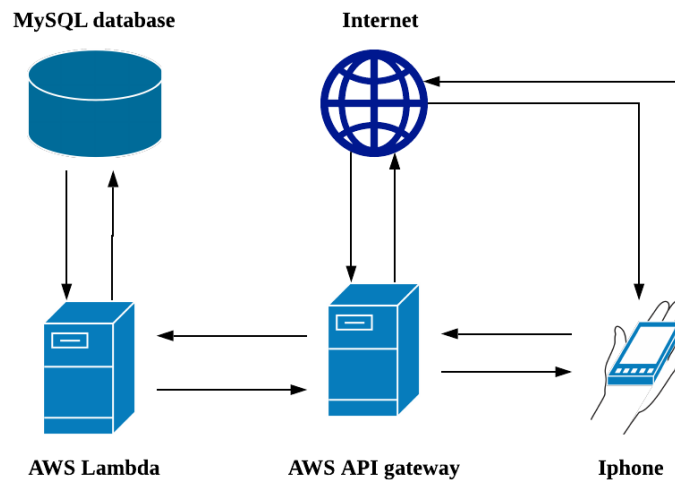
In the following pages, this section primarily gives the instructions on the installation of Smartstatis and how each component communicates with the others in the application architecture.

### **5. In-build API**

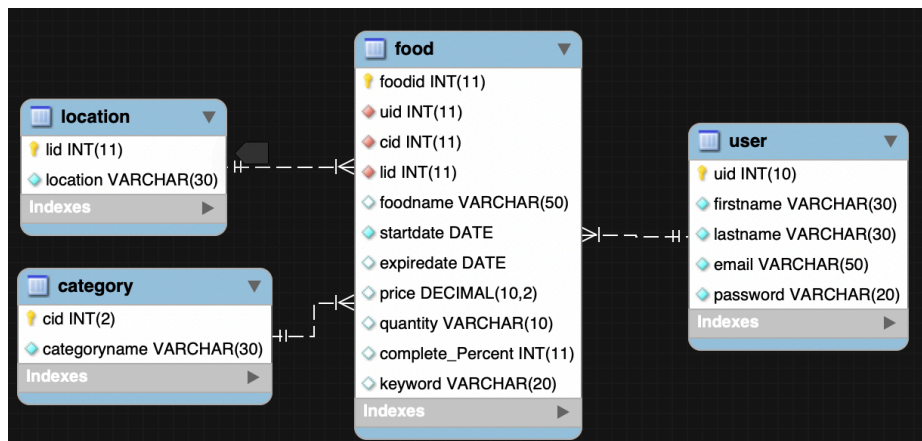
AWS also provides in-build API for the developers to setup API access to the database. Rather than building API manually on the other platform, the developers can simply upload the scripts file to AWS API Gateway and assign an URL to the interface to build their API with less consideration of security as AWS also provides functions to enhance the security. This can then save considerable amount of time from developing an API interface.

## Section 1 Installation

The diagram below demonstrates the system architecture of Smartstatist.



### 1. Setup database (MySQL in AWS RDS)



The diagram above shows the schema of database for Smartstatist. The User table contains all the information required for the users. In order to setup the database for Smartstatist properly, the developers need to create their own database following the same table name and column name in the given schema.

In addition, all the primary keys for each table are auto-generated. In other words, the developers need to set the constraint for auto-generating integer primary keys in order to setup the database properly.

For further information on how to create a RDS MySQL instance, here is the link for the tutorial:

[https://docs.aws.amazon.com/en\\_us/AmazonRDS/latest/UserGuide/CHAP\\_Tutorials.WebServerDB.CreateDBInstance.html](https://docs.aws.amazon.com/en_us/AmazonRDS/latest/UserGuide/CHAP_Tutorials.WebServerDB.CreateDBInstance.html)

## 2. Setup AWS Lambda

AWS Lambda is the platform where the computing logic and data retrieving logic are defined in the application backend. After the database is created, the developers need to add functions into AWS Lambda for the data communication between API interface and MySQL instance. However, AWS Lambda provides an excellent feature that the developers can import the scripts with the support of multiple programming language. In this document, a link to all the script package is given so that the developers can then click the link to download all the packages so that the developers can then upload those packages to AWS Lambda according to the manual provided in the following link.

<https://github.com/ta9-genx-leader/SmartStatis/tree/master/AWS%20Lambda>

## 3. Setup AWS API Gateway

After completing the AWS Lambda functions, the developers can then establish AWS API Gateway as the interfaces according to those AWS Lambda functions they just create. These interfaces of AWS API Gateway is the interfaces where the Smartstatis actually communicates with by HTTPS requests.

For further details on how to install AWS API Gateway, please click the following link.

<https://github.com/ta9-genx-leader/SmartStatis/tree/master/AWS%20Lambda>

## 4. Setup Imgur Image API (in Internet)

As one of the features in Smartstatis is to help the users to add food by simply scanning receipts, an Image storage is then required as we consider the further maintenance when the systems fails to identify the unusual receipts so that we can then obtain the samples in order to enhance the features.

Therefore, Smartstatis also require an access to an Image Storage API. In this case, we utilize Imgur API for the storage of the images from scanning receipts.

After installing Imgur API, the developers must remember the **CLIENT ID** as this will be used in the Smartstatis project.

For further details on how to setup Imgur API, please click the following link for tutorials.

<https://api.imgur.com/endpoints>

## 5. Setup Baidu OCR API (in Internet)

In order to read the receipt images, an Optical character recognition API is implemented to analysis the image, we choose Baidu OCR API for the OCR analysis, as it could transfer the image link from Imgur API to text. After creating the API account, the developers need to use **API ID**, **API KEY** and **SECRET KEY** in python on AWS Lambda function.

The following link is the link to the required package.

<https://github.com/ta9-genx-leader/SmartStatis/tree/master/AWS%20Lambda/ReadReceipt>

For further details on how to setup Baidu OCR API, please click the following link for tutorials.

<https://cloud.baidu.com/doc/OCR/>

## 6. Setup Youtube API (in Internet)

As one of the features for Smartstatis is to help the users to search the relevant video for recipes, we have introduced the function for searching for videos on Youtube. In other words, the mobile device communicates with the API published by Youtube. Therefore, the developers need to setup Youtube API so as to obtain the **API KEY** embedded into the Smartstatis project. This means that the developers need to remember the **API KEY** after they complete the registering from Youtube.

For further details on how to setup Youtube API, please click the following link for tutorials.

<https://developers.google.com/youtube/v3/getting-started>

## 7. Smartstatis application

In order to setup the Smartstatis project on an IOS-system computer, the developers must install **Xcode** in their IOS-system compute. The Smartstatis project can be downloaded from the following link.

<https://github.com/ta9-genx-leader/SmartStatis/tree/master/Final>

After the developers complete the previous steps, they should have the following information for the application backend.

1. Youtube API Key
  2. Imgur Client ID
  3. URLs for all the interfaces of AWS API Gateway
- please make changes in the HttpUrl class accordingly.

<https://github.com/ta9-genx-leader/SmartStatis/blob/master/Final/SmartStatis/SmartStatis/Object/HttpUrl.swift>

After the changes are made, the developers can then compile the Smartstatis project in Xcode and deploy the project on either an iphone simulators or a physical iphone.

## **8. Publish Smartstatis on App Store**

After all the previous steps are complete, Smartstatis should work properly on either the simulator or the physical iphone. Afterwards, the developers can then publish Smartstatis to AppStore.

For more details on how to publish an IOS application to AppStore, please click the following link.

[https://medium.com/@the\\_manifest/how-to-publish-your-app-on-apples-app-store-in-2018-f76f22a5c33a](https://medium.com/@the_manifest/how-to-publish-your-app-on-apples-app-store-in-2018-f76f22a5c33a)

## **Section 2 Data source**

### **1. Australian Food Composition**

Australian Food composition provides food item, food categories and food classifications in Australia, it updates annually, future users could download the csv file from the Australian Food Standards website and using the python script called “Data Wrangling for Food consumption.ipynb” to do the data wrangling process, then update the new food details on the AWS Lambda function called foodwithremove.

Please refer to the following link for the data wrangling script.

<https://github.com/ta9-genx-leader/SmartStatis/tree/master/AWS%20Lambda/Data%20Wrangling>

Please refer to the following link for the data set.

<http://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/downloadableexcelfiles.aspx>

### **2. Food Storage Times**

Food Storage Times is a pdf file published annually, it provides the best food storage time, , future users could download the pdf file from the website and use the “Data Wrangling for Food Storage time.ipynb” to update the new food storage times on the AWS Lambda function called foodwithremove.

Please refer to the following link for the data wrangling script.

<https://github.com/ta9-genx-leader/SmartStatis/tree/master/AWS%20Lambda/Data%20Wrangling>

Please refer to the following link for the data set.

[https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/basics-for-handling-food-safely/ct\\_index](https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/safe-food-handling/basics-for-handling-food-safely/ct_index)

### **3. National Waste Report and household expenditure on food**

National Waste Report will be updated based on annually, download the latest pdf report and update the average waste money on the AWS Lambda function called reportdata.

Please refer to the following link for the data set.

<https://www.environment.gov.au/protection/waste-resource-recovery/national-waste-reports>

<http://www.tai.org.au/node/1580>