Web GIS for Health Services in AL-Seeb Walayat, Muscat, Oman

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Abstract:

Web GIS is a type of distributed geographic information system, comprising at least a server and a client(s), where the server is a GIS server and the client is a web browser, desktop application, or mobile application, (ESRI,2017). By this definition, web GIS introduces distinct advantages over traditional desktop GIS such as global reach, large number of users, better cross-platform capability, low cost compared to the number of users, easy to use, unified updates, and diverse applications. Because of that, the applications of Web GIS can be utilized in any domain deals with spatial data and information. Health Services Sector is one of these domains. Web GIS can be utilized in health sector by different ways. In this study, Web GIS is used to disseminate information about different health services in AL-Seeb Walayat, Muscat, Oman to help citizens and residents find the required health service when it is needed using a web browser either on a PC or a Mobile Phone. They will have access to full information about the nearby health centers according to their locations, opening hours, available medical services, contact means,…..etc. Spatial and non-spatial data of available health centers have been collected and stored in a spatial database using ArcGIS 10.4.1. The produced final maps have been transferred to "Arc GIS Online" to share them on the Internet and extract the HTML codes to be used for a special Web Site for this project.

Study Area

AL-Seeb Walayat is strategically located on the Sea of Oman. It is located in the northwestern part of Muscat Governorate, figure 1. Al-Seeb stretches along Oman gulf coast of about 50 km. The total area is (491.80) km², and its population according to 2016 estimations is (391,315) capita, (NSCI, 2016), which means, it is the largest state in the Sultanate in terms of population.

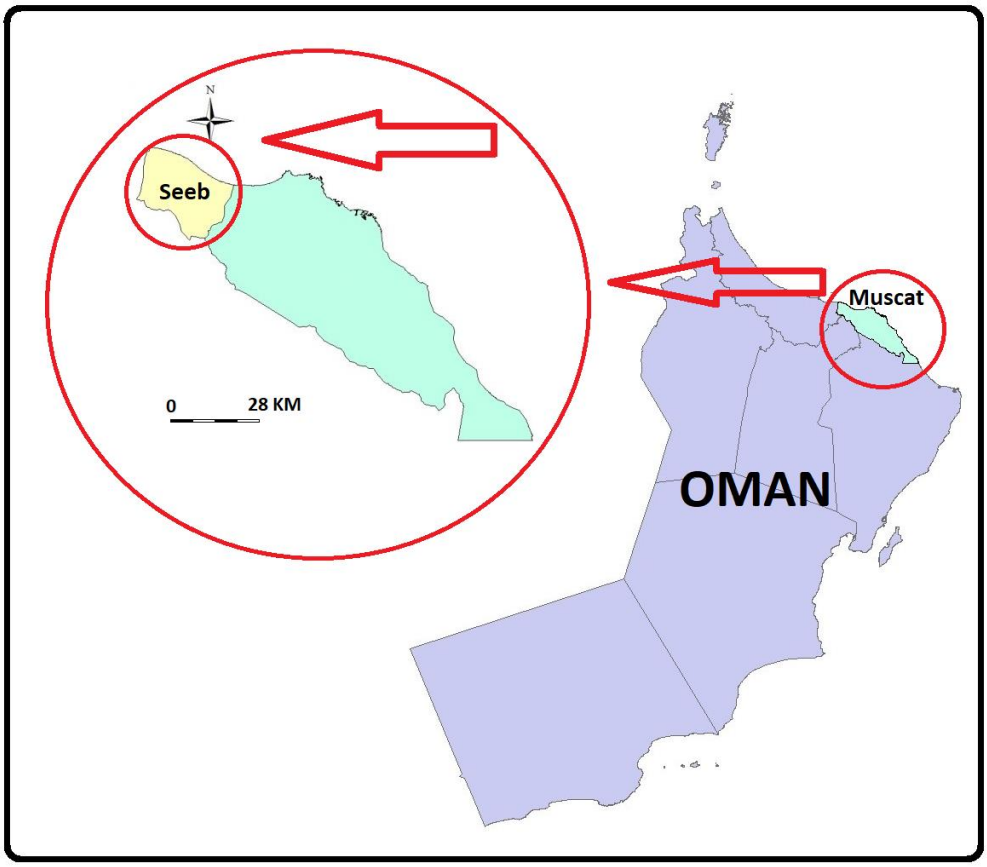

Figure 1, The geographical location of the study area, (Azaz, Al-Raeasy, 2018)

Methodology

AL-Seeb Walayat has eight heath centers according to "Development at glance" Report, (NSCI, 2017). The geographical coordinates of these health centers have been collected through Omani Ministry of Health e-portal, (Ministry of Health, 2018). Spatial and non-spatial data of available health centers have been collected and stored in a spatial database using ArcGIS 10.4.1. The produced final maps have been transferred to "Arc GIS Online" to share them on the Internet and extract the HTML codes to be used for a special Web Site for this project.

Procedures

1. First of all, you need to have an account in Arc GIS Online platform, figure 2, so that you can create your Web GIS applications.
2. After logging in Arc GIS Online platform, you will choose the option of Making a map, you will have the following screen, figure 2.
3. You need to add your data, you have four options to add your data, in this project, "Add Layer from file" option has been selected.

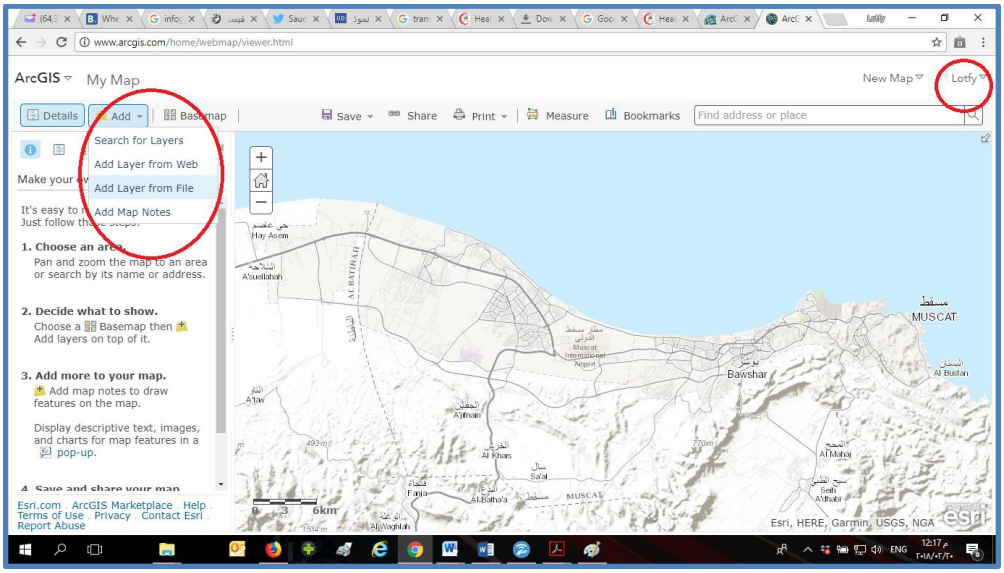

Figure 2, Arc GIS Online platform

4. When you choose "Add Layer from file" option, you will have four different types of files, Figure 3.

In this project; the first two options have been tested, however, the first option has been used in this paper.

5. The Locations of the eight health centers of AL-Seeb have been appeared on the map in Arc GIS Online. The symbols have been changed to reflect the job of these centers, Figure 4.

6. There are many types of base map at Arc GIS Online that can be used for the Web Mapping, Openstreet map has been used in this paper, Figure 5.

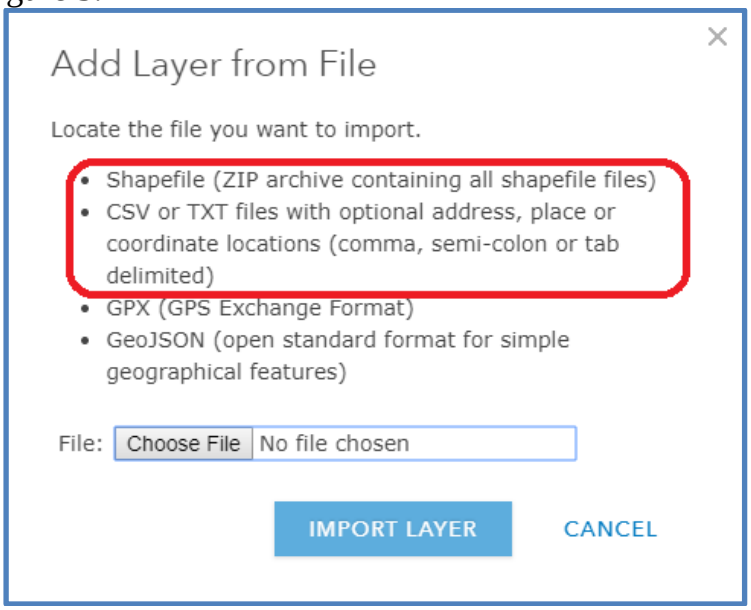

Figure 3, The different types of files that can be added on Arc GIS Online

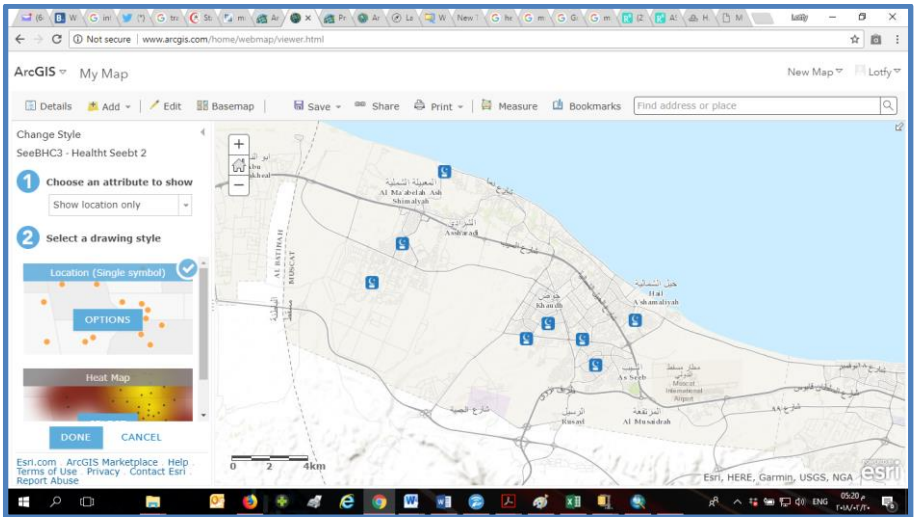

Figure 4, The Locations of the eight health centers of AL-Seeb

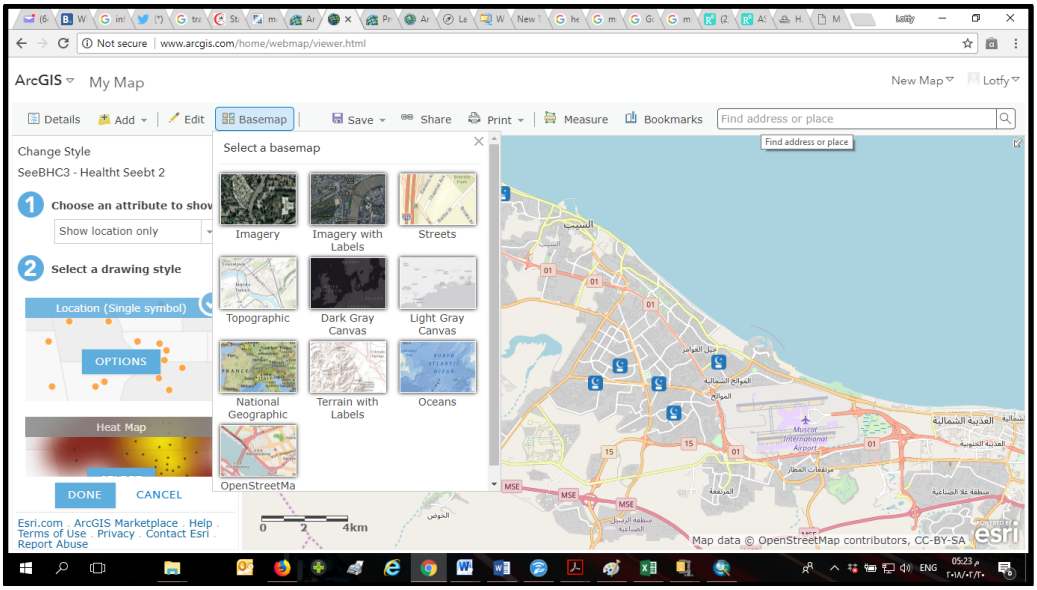

Figure 5 Types of base map at Arc GIS Online and the application of Openstreet map

7. Pop-up contents can be managed and selected according to the attributes of the selected spatial database, figures 6 , 7 and 8

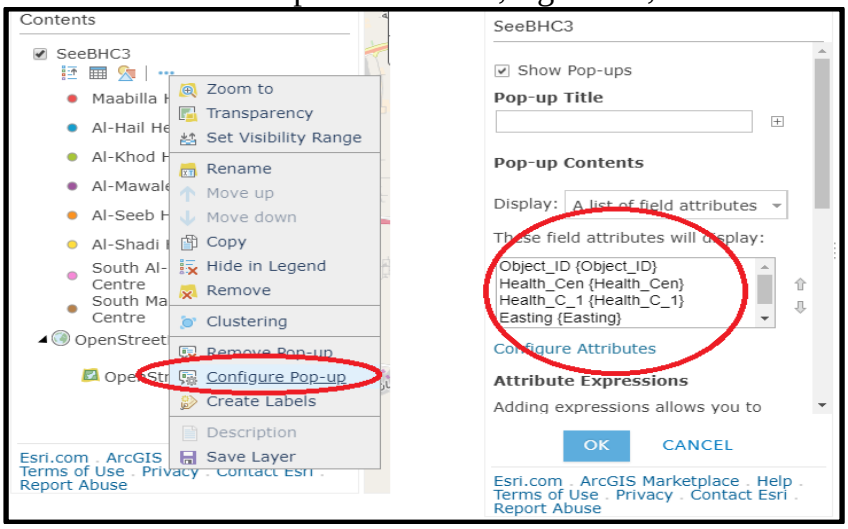

Figure 6 Pop-up contents management and selection

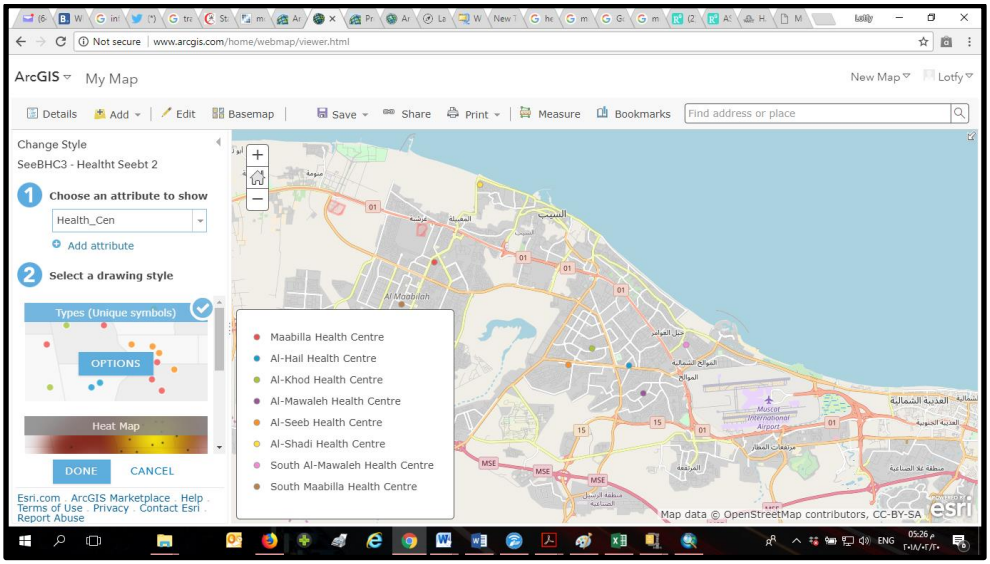

Figure 7, The Pop-up contents of the 8 health centers of AL-Seeb

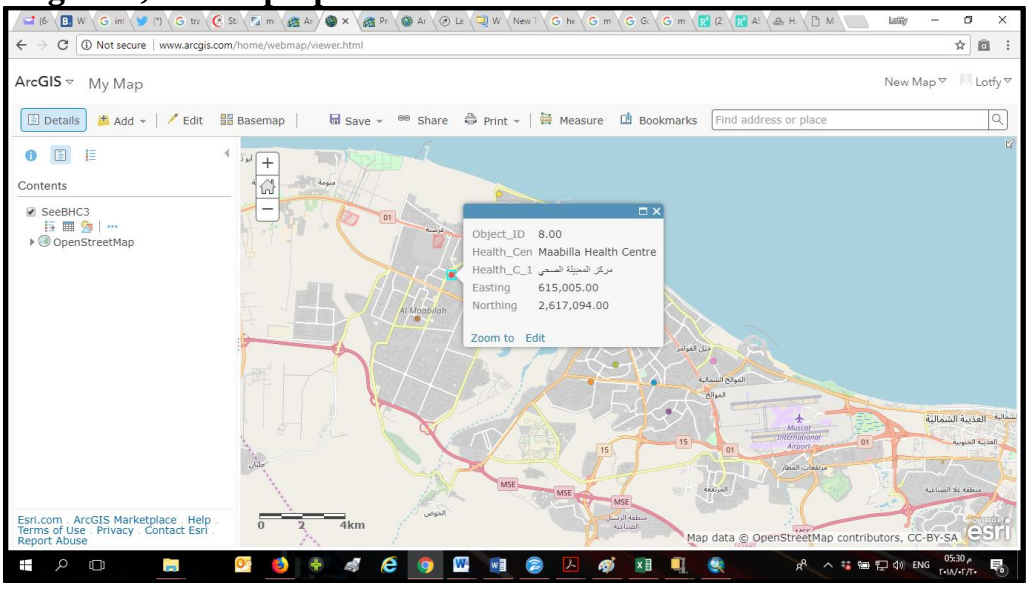

Figure 8 The Pop-up contents of one health center

8. Label features can be added and edited, figure 9

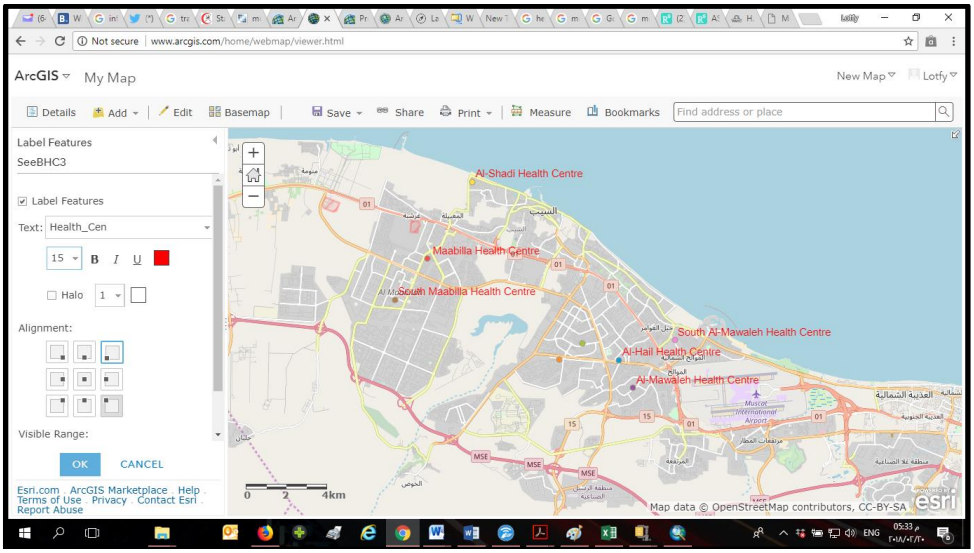

Figure 9, Label features editing

9. The final map can be shared online, so that interested users of the health centers in this area can access the required information, Figure 10, the following URL has been created for this project , **http://arcg.is/1e8XqT**

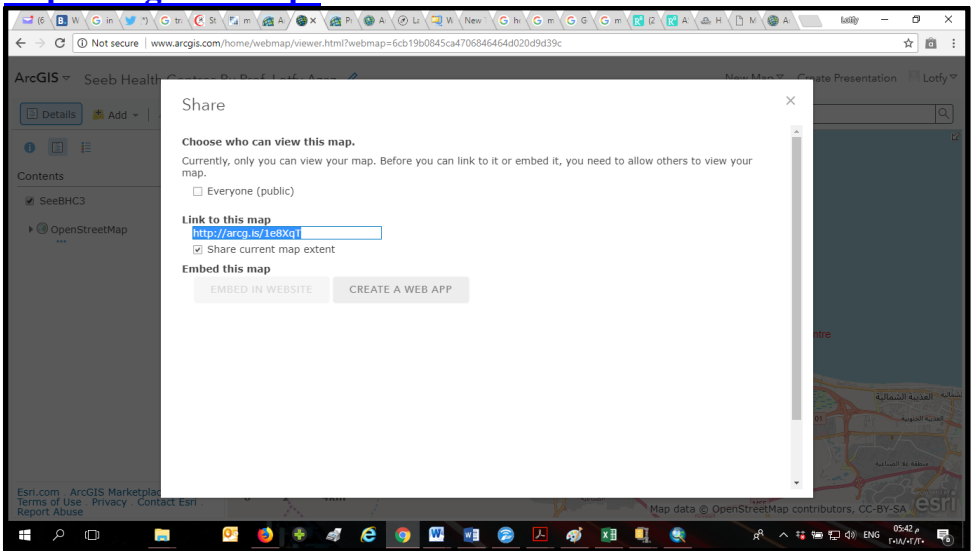

Figure 10, sharing the final map online

10. A web application can be created as well to maximize the benefits of Web GIS mapping, figure 11.

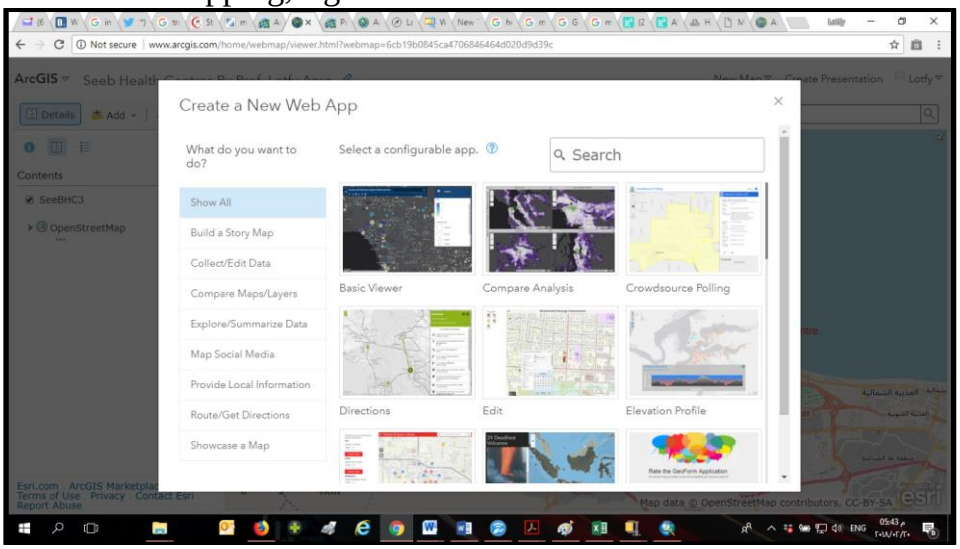

Figure 11, web application creation at Arc GIS Online

11. Seeb Health Centers Web Application has been created for this project, figure 12.

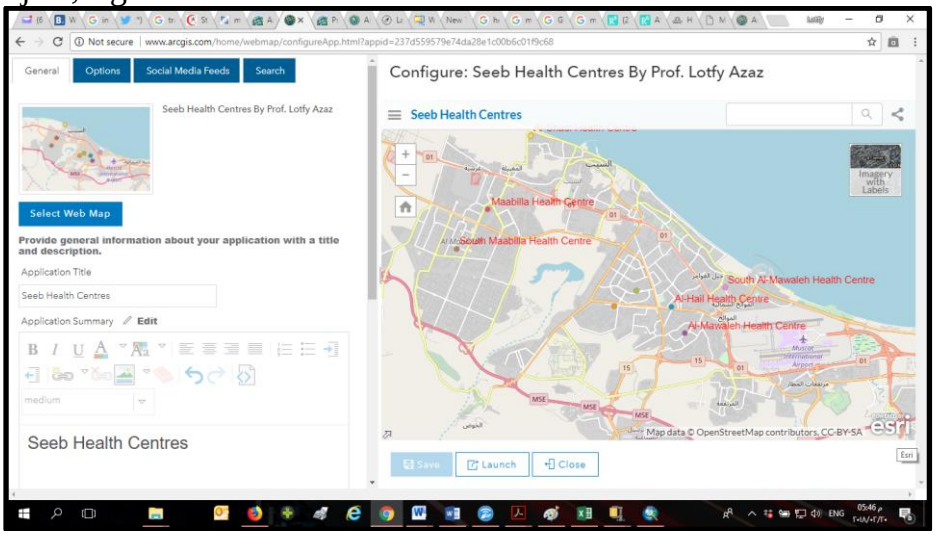

Figure 12, web application configuration for Al- Seeb Health Centers

12. The final output of Al- Seeb Health Centers web application, figure 13 can be accessed from the following URL: **http://www.arcgis.com/apps/PublicInformation/index.html?appid=237d559579e74da28e1c00b6c01f9c68**

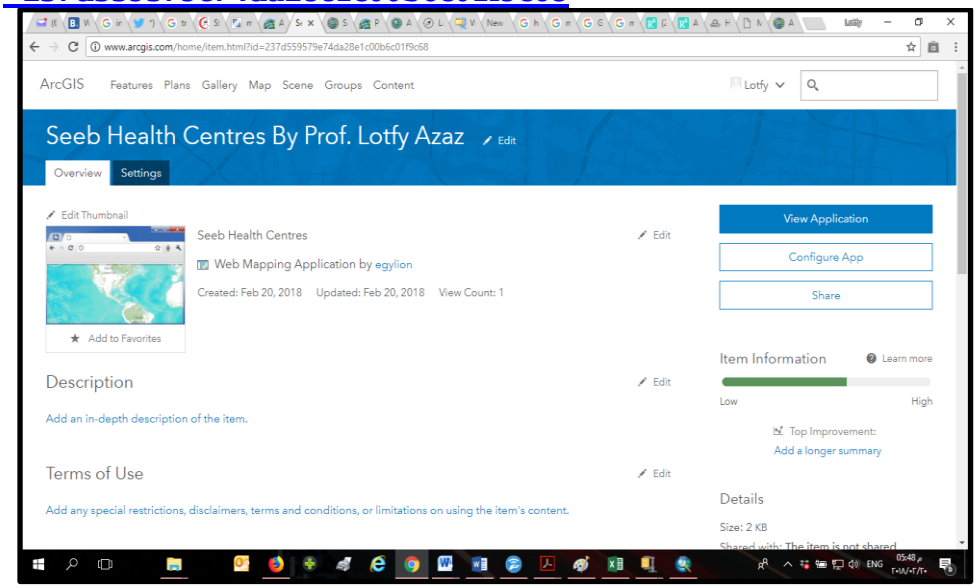

Figure 13, Seeb Health Centres Web Application

Conclusions

In this study, Web GIS is used to disseminate information about different health services in AL-Seeb Walayat, Muscat, Oman to help citizens and residents find the required health service when it is needed using a web browser either on a PC or a Mobile Phone. They will have access to full information about the nearby health centers according to their locations, opening hours, available medical services, contact means,…..etc. Spatial and non-spatial data of available health centers have been collected and stored in a spatial database using ArcGIS 10.4.1. The produced final maps have been transferred to "Arc GIS Online" to share them on the Internet and extract the HTML codes to be used for a special Web Site for this project.

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