



WILEY 1.0

User Guide

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Wiley Overview

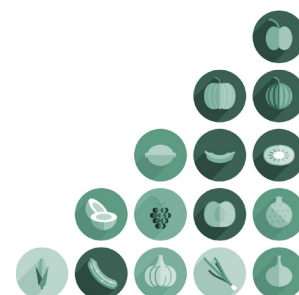
The Wiley product is a web-based food recall monitoring application that allows food industry professionals to discover trends in Food and Drug Administration (FDA) food recall data published at openFDA.gov.

The web application is developed using only open source software and is deployed in an Orbis Amazon Web Services (AWS) environment. Wiley was developed using Agile development practices and adheres to the U.S. Digital Services Playbook.



Key Wiley software components include the following:

- **Graphical User Interface:** A collection of web-based search, graph and map applications integrated into several dynamic web pages. The search window allows the user to search for recall content based on Time, Location (by country and US state), Keyword and Food Group. The latter does not exist as a standard FDA selection choice but was developed using custom designed semantic web technology. The search results are displayed geo-spatially on a map and in a tabular format with index card frames. The results gain further interpretation through the use of dynamic bar, line and donut graphs.
- **Data Services:** Wiley incorporates Application Programming Interfaces (APIs) created by Orbis and provided by the FDA. It also utilizes custom built APIs and data services that implement semantic search technology in order to perform data mining fact extraction. In addition, it has continuous monitoring services to screen end user query behaviors over time and also includes tabular view and query responses.
- **Databases:** Wiley utilizes an industry standard open source Resource Description Framework (RDF) Sesame database that is decoupled from the data services and web application to provide expandable, quick result sets for the user interface. Wiley also accesses the openFDA database and a small open source database to store end user queries.



Graphical User Interface

Wiley has a Graphical User Interface consisting of a three page dashboard configuration that includes a Home Page, semantic-driven Search Page and a Monitor Page that continually processes user queries. Both the Home Page and a Monitor Page are dynamically driven to display query results as new user data is collected.

Home Page

The Home Page, shown in Figure 1, is the default page the end user will see upon opening the application. An icon-driven Selection Menu, which also includes a hyperlinked Home Page Wiley Logo, allows the user to switch between the Home Page, Search Page and Monitor Page. The Selection is located on the left side of each of the Wiley web pages.

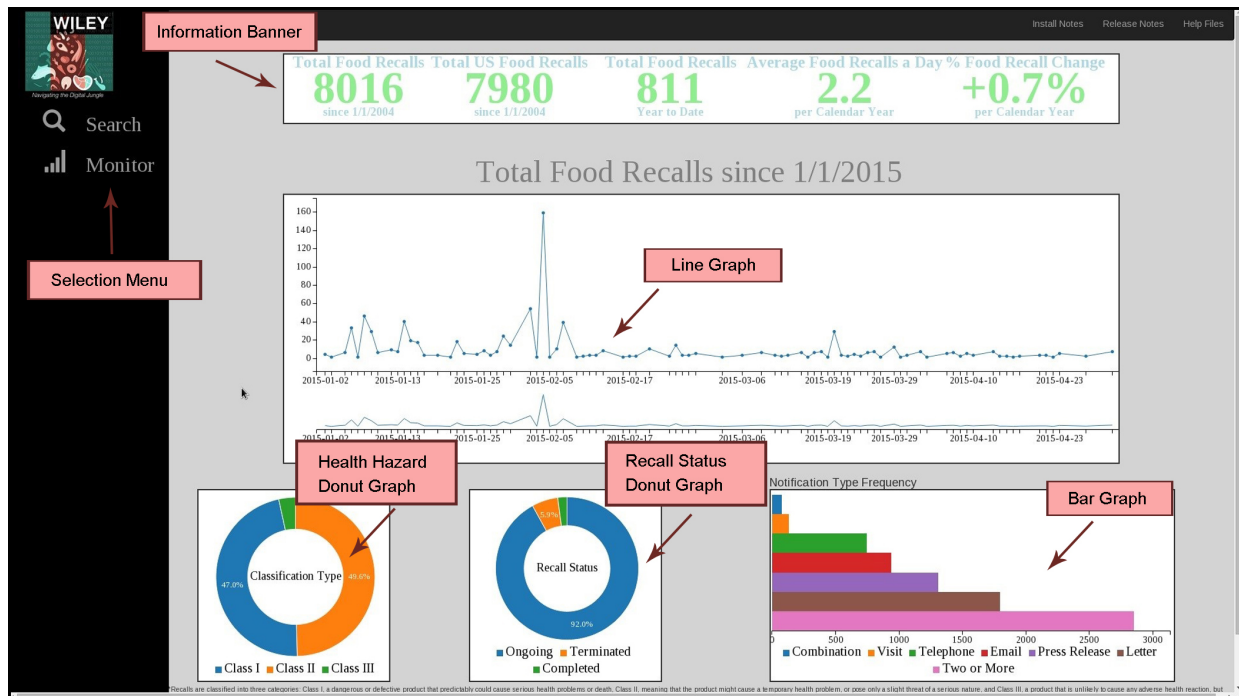


Figure 1: Wiley Home Page

An information banner provides an overview status report of the food recall database. The following information calculations are provided:

- Total Food Recalls since June 2005 (Figure 1 example calculation= 8016)
- Total US Food Recalls since June 2005 (Figure 1 example calculation= 7980)
- Year-to-date food recalls (Figure 1 example calculation=811)
- Average recalls per day since June 2005 (Figure 1 example calculation= 2.2)
- Yearly change in Food Recalls (Figure 1 example calculation = 0.7%)

Home Page cont...

A Line Graph shows the number of voluntary Food Recalls over time since 1/1/2015. The end user can scroll over each point on the line graph to view the Food Recall value. A smaller line graph is provided to allow end users to zoom into small subsections of the line graph.

A Bar Graph shows a summation of the methods used by the FDA to notify the public about Food recall.

The Health Hazard donut graph describes the percentage of recalls based on their relative degree of health hazard as defined by FDA—Class I, Class II and Class III.

- Class I: Dangerous or defective products that predictably could cause serious health problems or death.
- Class II: Might cause a temporary health problem, or pose only a slight threat of a serious nature.
- Class III: Unlikely to cause any adverse health reaction, but that violate FDA labeling or manufacturing laws.

The Recall Status donut graph shows in percentages the status of the recalls in the four categories defined as follows:

- On-Going: A recall which is currently in progress.
- Completed: The recall action reaches the point at which the firm has actually retrieved and impounded all outstanding product or has completed product corrections.
- Terminated: All reasonable efforts have been made to remove or correct the recalled product in accordance with the recall strategy.
- Pending: Actions that have been determined to be recalls, but that remain in the process of being classified.



Search Page

The Search Page, shown in Figure 2, allows the end user to perform queries over the Food Recall database. The required search terms include Data Range and Location (state and country).

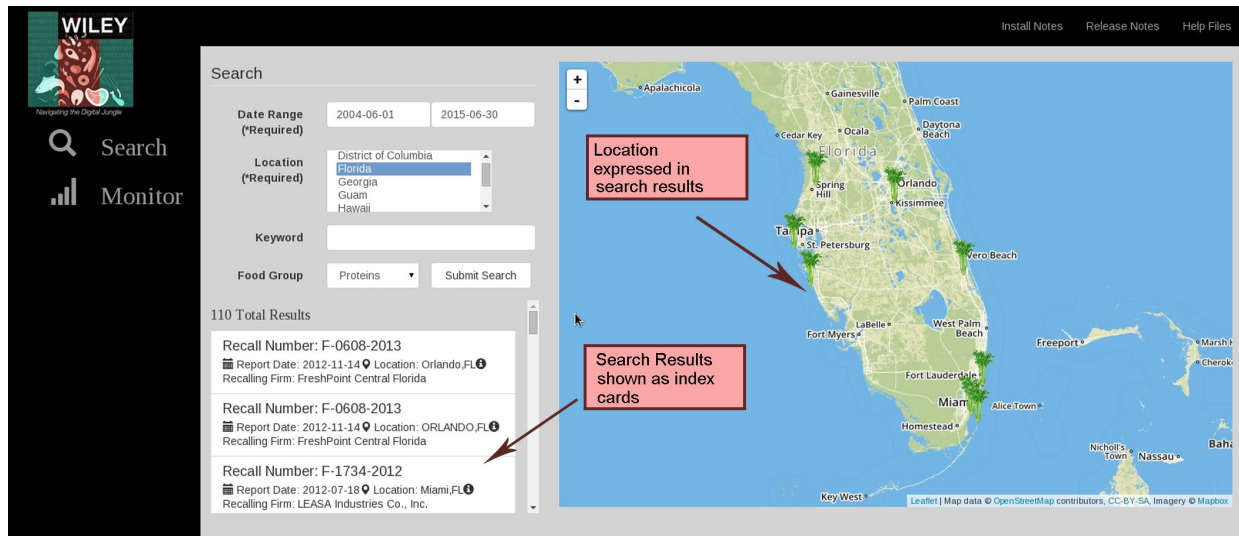


Figure 2: Search Page

The Location drop down menu allows a user to select more than one state location. The Data Range results in the end user seeing a pop-up calendar window, shown in Figure 3, to select the start and end date.

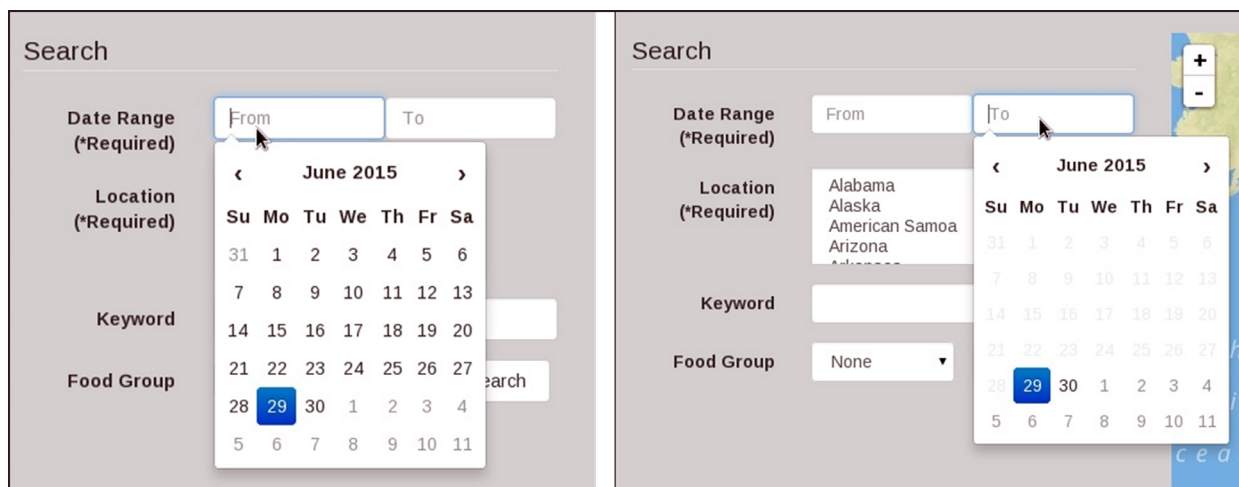
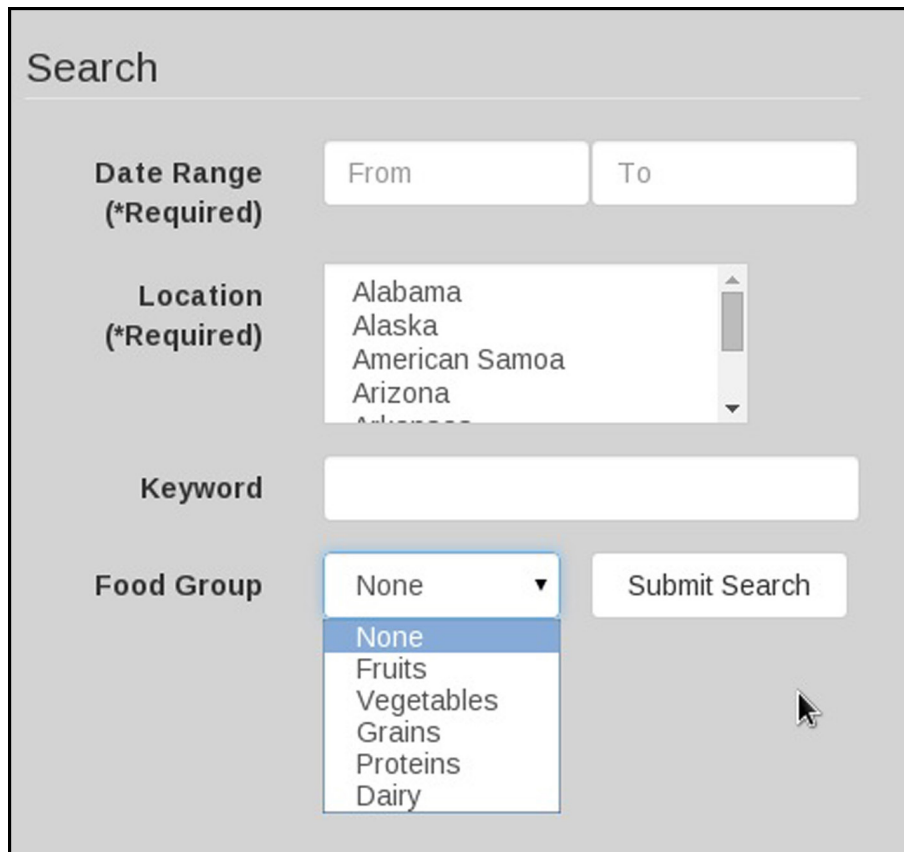


Figure 3: Calendar Pop Up Window



Search Page cont...

For Advanced Search, the user can type a keyword in the keyword search box. The search returns information found in any of the openFDA metadata fields (User ID, product description, Classification, etc.). The final end user selected search field is the Food Group drop down window which is an added feature for search over the FDA database. The end user selection of the Food Group returns results that are aligned to one of five (5) primary food groups—Fruits, Vegetables, Grains, Proteins, and Dairy. While not explicitly called out in the openFDA data, the Wiley data services uses semantic web technology to infer the food group based upon the description in the openFDA data.



The screenshot shows a search interface with the following elements:

- Date Range (*Required):** Two input fields labeled "From" and "To".
- Location (*Required):** A dropdown menu showing a list of US states and territories: Alabama, Alaska, American Samoa, Arizona, and Arkansas.
- Keyword:** A single-line text input field.
- Food Group:** A dropdown menu with the following options: None, Fruits, Vegetables, Grains, Proteins, and Dairy. The "None" option is currently selected.
- Submit Search:** A button to execute the search.

Figure 4: Food Group Selection Criteria

Once the end user has selected the search criteria and selects the “Submit Search button”, the application displays the total number of records (Figure 2 example shows 110) and a list of query results are displayed as index cards in order of the Recall ID with select metadata shown to the end user—product name, recall initiation date and food description. When the user hovers over the index card, a full display of associated metadata is displayed. Finally the location mentioned in each search results are shown in a world map, indicated by a celery icon.

Monitor Page

The Monitor Page, shown in Figure 5, provides continuous monitoring of queries to return a collection of profiles that are the result of monitoring end users. Specifically, the Total queries since June 2015 and the corresponding Query time (ms), Year-to-date queries, and Average queries per day. A line graph displays a list of queries over time. Finally, a tabular view shows the Top Ten Queries which includes the Query number, Product Name and User ID.

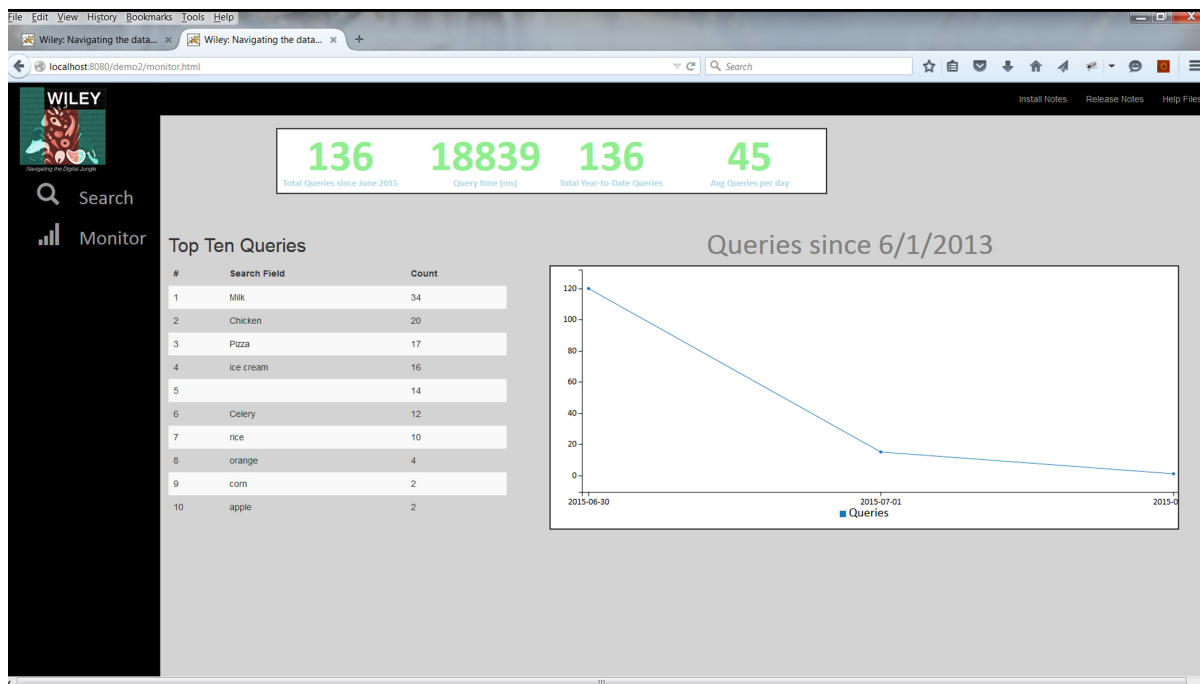
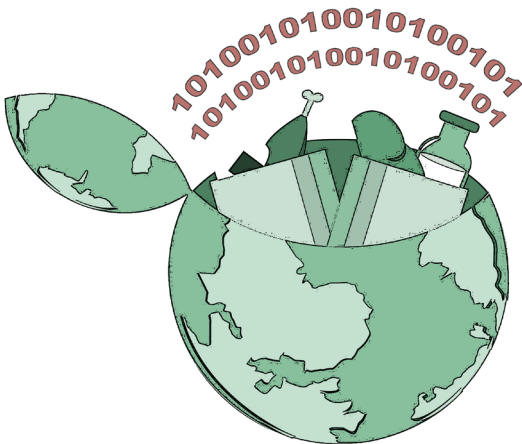


Figure 5: Monitor Page



GLOSSARY

Metadata—a set of data that describes and gives information about other data.

Web-based applications—An application in which all or some parts of the software are downloaded from the Web each time it is run. It may refer to browser-based apps that run within the user's Web browser, or to “rich client” desktop apps that do not use a browser to mobile apps that access the Web for additional information.

Web-service—a method of communication between two electronic devices over a network. It is a software function provided at a network address over the web with the service always on as in the concept of utility computing.

