Google Home Page and Search Result Page Testing Approach

Date: 22.11.2019, Author: Michał Wierzbicki

1. Introduction

This document has been created to communicate general testing approach to the interested parties.

2. Objectives

'Google Home Page' and 'Google Search Result Page' are parts of 'Google Search' web application which provides web searching engine under 'www.google.com' url. 'Google Search' requires Internet connection and supported browser. Main feature is to be able to enter keyword in the Google Home Page Search Box and after clicking 'Google Search' button (for EN version) or 'Enter' keyboard button the correct results for searched text should be displayed on Google Search Result Page.
Application should work on various browsers (FireFox, Chrome, Internet Explorer, Safari, Opera) on PC/tablets/mobile phones. The application has responsive user interface that should be displayed correctly on different devices and different screen resolution.
Application supports localization engine and the pages will be by default displayed in the language corresponding to the localization result.

To access Google Home and Search Results Page UI analysis (list of web elements) please refer to the file **2.GHP_GSRP_UIdoc.pdf** in the repository. The file contains list of web elements on tested pages.

3. Testing approach

GHP - 'Google Home Page'
GSRP - 'Google Search Result Page'

Testing approach depends on many factors.
First question that we should start with - Is there a documentation with requirements?
If there is, then we can write test cases based on documentation. We can perform testing based on analytical approach like risk-based testing or on model that is described in requirements. We are also able to prepare specified checklists. This also gives ability to test non-functional attributes like performance or load testing (if documentation has non-functional requirements).
If there is no documentation, then we should proceed for e.g. with dynamic and heuristic approaches like exploratory testing, testing based on experience with similar applications etc.
In this case we can found some documents that we may use as a documentation (e.g. help instructions). This gives us knowledge on how things that can be found on GHP and GSRP should work, but there are still a lot of features not mentioned there that should be tested.
In this case, where the GHP and GSHP are already working in the production environment we will use Reactive approach (design and coding are completed).
To test the web application various types of tests should be performed, from tests of the UI and responsive design, through search engine and API, ending on non-functional factors like performance testing. We do not have access to the search engine code, black-box testing will be performed.
As 'Google' being one of the biggest search engines used by millions of users on a daily basis I would based my testing strategy on mix of testing based on available documentation (e.g. how links on GHP should work, what should be included in search results etc.), risk-based focused on most important features (like search results engine), experience in testing for similar applications, and dynamic and heuristic approaches like exploratory testing to fast check some critical features that are not mentioned in available documentation, but can be later transformed into documented test cases. Manual testing can be performed at first to verify that features are working as expected, then automated tests can be written as part of the regression testing suite.

In this case I will focus on functional testing including*:
- *verifying if all the links on GHP and GSRP works correctly*
- *verifying if user is redirected to GSRP after entering keywords and performing search on GHP*
- *verifying if GSRP contains correct search results for different inputs*
- *verifying if GSRP search results are displayed correctly*

As well as non-functional testing*:

- verifying if graphical elements are correct size and visible e.g. 'Google' logo
- verifying user interface responsiveness on different devices/resolutions
- verifying if GHP and GSRP works correctly on different browsers
- verifying if GHP and GSRP response time is acceptable (we can discuss what 'acceptable' means if we do not have requirements documented)

*Section 5 contains more specified list of things that can be checked based on approach mentioned above (with sample test cases in separate file **3.GHP_GHRP_SampleTestCases.pdf**).

3.1. Test Environment

Google pages will be tested on production environment.
To fully cover some functionalities various types of browsers and devices should be prepared.
To run automated tests Jenkins job can be set up.

3.2. Testing tools

Some of the tests will be performed manually (e.g. responsive user interface, graphical checks like correct logo etc.)
Automated UI tests will be written using Java, Selenium WebDriver, Cucumber BDD, AssertJ and Maven. Non-functional tests like performance or load tests can be performed with JMeter.

4. Things to be tested.

Below you can find list of exemplary things to be checked based on available documentation, knowledge, experience and other factors mentioned in our approach.

NOTE: Sample test cases in BDD style based on the list below can be found in **GHP_GSRP_SampleTestCases.pdf** file in the repository. Please note that this file also contains tests cases that will be automated.

List of exemplary things to be checked (random order):

Functional tests:

- verifying that links from top-right menu works and redirects user to correct sites
- verifying that links from footer works and redirects user to correct site
- verifying that 'I'm Feeling Lucky' button works and redirects user to correct site
- verifying that Google Search Result Page contains correct bookmarks
- verifying that clicking Search Result Page bookmarks redirects to correct result view
- verifying that search engine request get hit by clicking on 'Google Search' button or Enter button after entering the search item in search box
- verifying then user is redirected to GSRP after clicking 'Google Search' when search box is not empty
  verifying then user is redirected to GSRP after clicking 'Google Search' when search box is empty
- verifying that the response search results fetched for a particular keyword is correct and related to the keyword
- verifying that search result items contains links to the particular webpage
- verifying that the response fetched for a particular keyword is correct and related to the keyword, containing links to the particular webpage
- verifying that the response are sorted by relevancy in descending
- verifying that response for different inputs like multi word keyword or special characters is correct
- verifying that the result contains link title, URL and description have the keyword highlighted in the response
- verifying that clicking the search result will lead to the corresponding web page
- verifying dropdown suggestions in search box e.g. providing input part of the input
- verifying that the time taken to fetch the result is displayed
- verifying that the total number of results for the keyword is displayed

- verifying that misspelled keyword should get corrected and response corresponding to the correct keyword should get displayed
- verifying that the search response should be localised that is response should be more relevant to the country/area from which the search request is initiated
- verifying Google converter service- 10USD in PLN
- verifying that incorrect keywords - keywords not having related result should lead to "did not match any documents" response
- verifying that for number of results more than the limit on a single page, pagination should be present, clicking on which user can navigate to subsequent page's result

Non-functional tests:

- verifying that all graphical elements are present and correctly placed
- verifying if texts are correct and there are no typos
- verifying that 'GHP' and 'GSRP' works correctly on different browsers
- verifying that 'GHP ' and 'GSRP' user interface is displayed correctly on different devices
- verifying that 'GHP' and 'GSRP' user interface is displayed correctly on different resolutions (for the web application resolutions can be also covered with different devices)
- verifying that 'GHP' and 'GSRP' works correct on different localization settings

+ some more non-functional testing. In this case when we do not have non-functional specification so it probably won't be tested

- verifying that 'GHP' and 'GSRP' load time is as per requirements
- verifying that 'GSRP' search result engine response time is as per requirements
- verifying that 'GHP' and 'GSRP' works under stress as per requirements
- all other kinds of non-functional tests