A. INFORMATIVENESS

Determined by the question: *Did you find the content you were looking for?*

Potential causes for bad informativeness:

    I.   bad index quality (desired result[s] not present on page)
   II.   bad ranking quality (desired result[s] not present or ranked too low)
  III.   desired result not clearly identifiable:
         A. inappropriate title and/or abstract
         B. too many other results
         C. too much content other than results
  IV.   Mislead by advertisement entry*

Corresponding countermeasures:

    1. improve index quality:
        a. include more results in index*
        b. remove duplicates, pages without information etc.*
    2. provide search suggestions / related search terms
    3. improve ranking quality (e.g., by using models to better predict relevance)
    4. improve title/abstract quality
    5. filter results where abstract text does not / no longer appear in content*
    6. clarify layout:
        a. clearly mark different types of results (text, images, products etc.)
        b. clearly separate results from other content such as ads (or remove the latter)*
        c. reduce amount of content other than results
        d. find optimal length for result abstract
        e. clearly separate title from abstract*
        f. improve information architecture (e.g., inverted pyramid [http://www.nngroup.com/articles/inverted-pyramids-in-cyberspace/])*
    7. provide semantic results (e.g., info boxes that answer queries directly on the page)
    8. provide contextual results (e.g., based on location, previous searches, user profile etc.)*
    9. improve scannability by appropriately highlighting title/abstract*

B. UNDERSTANDABILITY

Determined by the question: *Could you easily understand the provided content?*

Potential causes for bad understandability:

   I.   results presented in wrong language and/or poor translation*
   II.   poor title/abstract quality
  III.   use of ambiguous language
  IV.   use of ambiguous icons without textual explanation
   V.   use of counterintuitive interactions (e.g., missing affordances of non-underlined links)*
  VI.   content is too complex/complicated (for certain groups of users, e.g., kids or educationally handicapped people)*

Corresponding countermeasures:

1. provide option to choose and restrict language/region*
2. provide translation option
3. prefer results that are in same language as query*
4. improve title/abstract quality
5. improve understandability based on corresponding heuristics (e.g., avoid use of ambiguous language)*
6. provide alternative texts (e.g., tooltips) along icons
7. follow web conventions (e.g., common color codes, standard icons) for SERPs; ideally following the user's previous experience*
8. take characteristics of user into account, e.g., based on previous search queries*
9. filter dummy pages that include the query in their content only to receive clicks*

C. CONFUSION

Determined by the question: *Were you confused while using the webpage?*

Potential causes for confusion:

    I.   (types of) results not clearly identifiable
    II.   too many irrelevant results*
   III.   too much content other than results
   IV.   too many advertisements which are poorly marked as such; no clear separation between advertisements / sponsored results and real results*
    V.   use of ambiguous language
   VI.   use of ambiguous icons*
  VII.   important settings not easily reachable / hidden from user
 VIII.   too many options (e.g., for filtering results)
  IX.   current settings are not visible (e.g., only showing results in one language)*

Corresponding countermeasures:

1. improve index quality*
2. clearly highlight results and mark other content as such
3. clearly mark advertisements / sponsored results*
4. clearly mark different types of results
5. reduce amount of content other than results
6. avoid use of ambiguous language
7. provide alternative texts (e.g., tooltips) along icons
8. make important settings/options visible; make them reachable in as few clicks as possible*
9. provide help; make it reachable in as few clicks as possible
10. provide search suggestions / related search terms
11. show current main settings (if relevant to search result quality)*

D. DISTRACTION

Determined by the question: *Were you distracted by elements of the webpage?*

Potential causes for distraction:

I. too much content other than results
II. animated content
III. too many images
IV. non-results more salient than results*
V. overloaded results (e.g., displaying secondary information, social media buttons etc.)
VI. bad / too strong contrasts (e.g., green/red, green/blue, ...)*

Corresponding countermeasures:

1. reduce amount of content other than results
2. reduce amount of animated content
3. reduce amount of images
4. ensure that results are more salient than other content*
5. clarify presentation of results:
   a. reduce to: title, URL, abstract
   b. make additional, secondary information available through "more" link (or similar, e.g., hover state)*
   c. make the title a hyperlink to the full information*
6. use adequate/good-for-reading contrasts*

E. READABILITY

Determined by the question: *Did typography and layout add to readability?*

Potential causes for bad readability:

 I. wrong font size or character spacing (too small / too large)*
 II. wrong line height (too small / too large)*
 III. too short/long lines*
 IV. font does not suit overall layout / font is not optimal for chosen font size, line height and line length (e.g., a sans-serif font where a serif font would add to readability)*
 V. text not properly grouped (e.g., via white space or separation lines)*
 VI. bad contrast
 VII. inconsistent alignment of results and/or other elements of the page

Corresponding countermeasures:

1. adjust font size or character spacing (or offer according option to reader)*
2. adjust line height*
3. adjust lines to appropriate length (recommendation: ~66 characters per line)*
4. try different fonts
5. add white space:
    a. between title, URL and abstract of result
    b. between results
    c. between results and other content
    d. increase margin left of results (particularly on large screens)*
6. use better contrast (very dark grey on very light grey is best for reading)
7. align results and other elements of the page consistently

F. INFORMATION DENSITY

Determined by the question: *Was there too much information presented on too little space?*

Potential causes for high information density:

 I. too many results per page
 II. too long result abstracts
 III. too much content other than results; content that is not related to results*
 IV. too little white space
 V. missing visual hierarchy with salient results*
 VI. overloaded results (e.g., displaying secondary information, social media buttons etc.)
 VII. too many icons/abbreviations encapsulating information*

Corresponding countermeasures:

1. reduce number of results per page
2. find optimal length for result abstract

3. reduce amount of content other than results
4. add white space:
    a. between title, URL and abstract of result
    b. between results
    c. between results and other content
5. introduce contrast and visual hierarchy to separate results from content other than results*
6. avoid infinite scrolling
7. provide browsing experience for long result list (e.g., jump to different dates)*
8. enable customization of search results page by users, e.g., number of results, (contextual) information to results, social features*
9. provide filter mechanism to reduce list of results without touching the search quality*
10. clarify presentation of results:
    a. reduce to: title, URL, abstract
    b. make additional, secondary information available through "more" link (or similar, e.g., hover state)*
11. remove unnecessary icons/abbreviations or add explaining tooltips*

G. REACHABILITY

Determined by the question: *Was your desired content easily and quickly reachable (concerning time and distance)?*

Potential causes for bad reachability:

I. too much scrolling effort for user:
    A. too much content other than results, especially above results
    B. too many results per page
    C. too long result abstracts
    D. bad ranking quality (desired result[s] not present or ranked too low)
    E. no additional browsing possibilities (e.g., jump navigation)*
II. desired result(s) not immediately identifiable:
    A. non-optimal title and/or abstract
    B. missing visual hierarchy*
    C. missing contrast between results and other content*

Corresponding countermeasures:

1. reduce scrolling effort:
    a. reduce amount of content other than results, especially above results
    b. reduce number of results per page
    c. provide browsing functionality*

  d. provide customizable number of results per page (e.g., from 10 to infinite scrolling)*

  e. find optimal length for result abstract

  f. improve ranking quality (e.g., by using models to better predict relevance)

2. better highlight results / improve result presentation:

  a. improve title/abstract quality

  b. introduce contrast and visual hierarchy to separate results from content other than results*

  c. ensure that results stand out against other content

  d. clearly mark content other than results

3. use Ajax technology to reduce navigation efforts