HEURISTIC EVALUATION OF GEOWEB

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1. GeoWeb

In present time there is great demand for geographic information provided by internet. Therefore it comes to large development of internet applications which provide these services. Applications are built by many means however the majority destitute many defects. One of these defects is insufficient usability of new projects.

2. Heuristic Evaluation

Heuristic evaluation is engineering usability method for searching usability problems in design of user interface so they can accompany process of interactive design as its part. Heuristic evaluation includes the small number of estimators examining interface and judging its harmony by known usability principles called „heuristics“ [4]. This method was described for the very first time by Nielsen and Molich in 1990 [6]. Even though heuristic evaluation finds many usability problems that are not found by user testing, it is also the case that it may miss some problems that can be found by user testing [3].

Generally is heuristic evaluation too much complicated for one person because one person is not able to find every interface usability problems. However different people can find different usability problems. Therefore it is possible to significantly improve method efficiency by including more evaluators. It can't be find the best evaluator and it can't be fully rely on one's findings. At first it is not true that the same man will be the best evaluator for all time. Secondly, some problems which can be hardly found can be found by evaluators who don't discover many usability problems. Therefore it is important to involve more evaluators to heuristic evaluation. Generally it is recommended to use 3 - 5 evaluators because it won't bring more information from larger number of evaluators. [2].

Heuristic evaluation is made by group of experts whose get list of points which may contain tested pages. Experts go through interface and try to answer most of points. These points are written by other experts who have sufficient experiences with usability testing. The points are mostly divided into thematic groups as for example users interface standards, help, error protection etc. At the end is made results aggregation and is written final report which contain list of problems and recommendations with solutions of this problems [1] [5].

3. Evaluation Suggestion for GeoWeb

Experts evaluate GeoWebs by following characteristics. These characteristics are separate into seven basic thematic groups. The last, the eighth group is list of maps which is important for selection of map demanded by user.

The separate sections are:

Environment of user interface

System should provide basic navigation items, actual data and present everything in understanding form.

1. Does history of user activity exist?
2. Does button „back“ exist?
3. Does button „forward“ exist?
4. Is selected icon visible in face of other icons?
5. Has every screen a title or headline which describes showed content?
6. Is cursor placed in the field which is the most often needed when user enter the screen or dialog window?
7. Is loading of map adequately quick?
8. Are all texts readable?
9. Are data actual?
10. Is interface the same in all maps?
11. Are used terms commonly known?
12. Is there some item which informs about loading?

Used technology

Does system provide support in different browsers and in different user's settings?

13. Isn't it necessary to have installed plug-ins?
14. Isn't it necessary to have installed other programs (e.g. Java)?
15. Is these any plug-ins provided on pages (this point is completes when isn't necessary to install)?
16. Is Internet Explorer supported?
17. Is Firefox supported?
18. Is Netscape supported?
19. Is Opera supported?
20. Is application well-arranged in resolution 800 x 600?
21. Is application well-arranged in resolution 1024 x 768?
22. Is application well-arranged in resolution 1280 x 1024?

Error dilemma

Users should be informed by application about all errors and possibility of its solving.

23. Is a sound used to signal an error?
24. Are error messages worded so that the system, not the user, takes the blame?
25. Are error messages grammatically correct?
26. Do error messages avoid the use of exclamation points?
27. Do error messages avoid the use of violent or hostile words?
28. Do messages place users in control of the system?
29. If an error is detected in a data entry field, does the system place the cursor in that field or highlight the error?
30. Do error messages inform the user of the error's severity?
31. Do error messages suggest the cause of the problem?

Flexibility, esthetics and design

Distribution of all application's items should be made with accordance with user's requirements. All items should have optimal part of screen. All control elements should be clear and well-arranged. Everything has to be in color accordance and easy for users at first sight.

32. Are icons sorted into thematic groups?
33. Are icons representative in relation to its functions?
34. Aren't icons overly detailed?
35. Are items of the page inserted into application suitable?
36. Are all items of the page comfort in color?
37. Isn't unused space more than 5%?
38. Does a map list occupy at minimal 40%?
39. Don't layers occupy more than 20%?
40. Doesn't minimap occupy more than 20%?
41. Does minimap occupy at least 3%?
42. Do layers occupy minimal 10%?
43. Is place for all items of page relevant to its importance?
44. Is name of page inserted to the upper edge of page?
45. Is enough free space around all text?
46. Is minimap in accordance to the total distribution?
47. Is good contrast, brightness and color harmony between pictures and background?
48. Is the whole application in one color scheme?
49. Are descriptions of all fields familiar, brief, polite and descriptive?

User-friendly application

Application should by easy, functional and intuitive for user.

50. Are icons sorted by its importance?
51. Are all important items of page highlighted?
52. Are layers sorted into thematic groups?
53. Are layers followed with legend?
54. Is there any graphic scale factor?
55. Is there any numbered scale factor?
56. Is there any scale factor also outside of status bar?
57. Are all items of new opened window linked back to window with map list?
58. Is there possibility to choose another map from windows with one concrete map list?
59. Is there link to help section?
60. Is there link to information of used technology?
61. Is there link or information about author of application?
62. Are items inserted into status bar also somewhere else on the page?
63. Are results of searching linked back to the map list?
64. Is searching through all layers automatic?
65. Are there details about object (address etc.)?
66. Is there any print preview?
67. Is map on screen same as print version?
68. Are in the print version associated records?
69. Does search automatically fill text?
70. Are hotkeys reserved?

71. Is user more initiator of actions then only respond to the system?
72. Are labels in Czech language?
73. Are labels grammatically correct?
74. Are used generally known abbreviations for all terms?
75. Does list of maps in map field correspond with list of maps in web pages?
76. Are used abbreviations clear?
77. Isn't search case-sensitive?

Privacy

Application should protect privacy map before opening by unauthorized persons.

78. Are privacy maps available through web interface?
79. Are privacy maps completely protected?
80. Is there any possibility to got into privacy area after registration?

Help and documentation

Also it would be better to work with application without any help it is recommended to have user--friendly and high quality help for user. It will make higher comfort of usability.

81. Is easy to go into help and back to the application?
82. Are information relevant?
83. Is information goal oriented (what can I do with this program)?
84. Are information descriptive (what is this thing for)?
85. Are information procedural (how do I do this task)?
86. Are information interpretive (why did that happen)?
87. Are information navigational (where am I)?
88. Are icons followed with context help?

Skills, user control and freedom

System should contain basic functions known by user and other function components which provide easy control of system.

89. Is it possible to set restrictive scale to show layers?
90. Is it possible to choose layers?
91. Is it possible to set automatic actualization of map field?
92. Is it possible to switch off automatic actualization of map field?
93. Is it possible to move by mouse in map?
94. Is it possible to move by keyboard in map?
95. Is it possible to move by arrows in map field?
96. Is it possible to choose quality of map?
97. Is it possible to zoom in by double-clicking?
98. Is it possible to zoom in by selection of area?
99. Is it possible to measure distance in a beeline?
100. Is it possible to measure distance of lines?
101. Is it easy to cancel selection?
102. Is it possible to switch to full screen?
103. Is it possible to center to selected item?
104. Is it possible to show whole map?
105. Is it possible to use tool which show information about object?
106. Is there „hotlink"?
107. Are there more databases from which „hotlink" getting information?
108. Is it possible to set exact scale?
109. Is a searching easy?
110. Is it possible to save map as image?
111. Is there possibility of additional selections for print formatting?
112. Does searching provide possibilities?
113. Is it possible to print map?
114. Is it possible to make more complex query?
115. Is it possible to search in menus by first letter?

List of maps

Provider should have easy accessible and well-arranged list of maps and have to provide sufficient number of map.

116. Is there any link to GIS maps from main page?
117. Is the map list accessible quick and easy?
118. Isn't necessary to use searching?
119. Are the maps divided by topics?
120. Are the maps divided into secured and unsecured ones?
121. Is there possibility to download some geodata?
122. Is provided web mapping server?
123. Is there online reference?
124. Is there description of layers?
125. Is there environmental map?
126. Is there geological map?
127. Is there bicycle road map?
128. Is there administrative map?
129. Is it possible to download offline manual?
130. Is it possible to send recommendation to administrator?
131. Is there possibility to send feedback from user for improving application?

4. How to Evaluate

The GIS and usability experts are going through single points. They can choose Yes, No or N/A. We can imagine how usable GeoWeb is from these results. Variants No and N/A are rated by usability relevance scale by experts [1].

0 = disagree that this is a usability problem at all
1 = cosmetic problem only: need not be fixed unless extra time is available on project
2 = minor usability problem: fixing this should be given low priority
3 = major usability problem: important to fix, so should be given high priority
4 = usability catastrophe: imperative to fix this before product can be released

Group of experts make final report which contain list of all discovered problems with rating and commentary with description of possible corrections. Institution can decide which problems will correct for better usability. In this case it is recommended to correct problems rated 3 and 4. After correction of all problems from these two categories is GeoWeb ready to use without any critical usability problems.

Final report must contain description of tested object, all usability problems with rate evaluation and suggested solutions. There should be also prediction about usability improvement after correction for each group of faults.

5. Conclusion

In usability testing this can be used instead of usability testing with evaluators. This article was about heuristic evaluation for usability testing of Geoweb. There is written 131 heuristics that have to be taken into account for intuitive, well-arranged and easy for using application. It is necessary to note these heuristics arise from our previous work and from our experiences. We hope our recommendation can be useful for someone who is solving a similar problem.

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Doručeno redakci: 10. 1. 2007
Recenzováno: 15. 2. 2007
Schváleno k publikování: 7. 4. 2008

ABSTRACT

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In present time there is great demand for geographic information provided by internet. Therefore it comes to large development of internet applications which provide these services. Applications are built by many means however the majority destitute many defects. One of these defects is insufficient usability of new projects.

This article describes methods of usability testing of GEOWEB through heuristic evaluation. This method was described by Nielsen and Molich in 1990 yet. It is testing with experts whose go through all heuristics and evaluate them.

In usability testing this can be used instead of usability testing with evaluators. There is written eight groups of heuristics. First group is about environment of user interface, that describe duty of using basic function, actual data etc. The other group is about used technology that is supported. Next group examine errors. The system must inform user about errors, contain of errors and how to repair. Flexibility, esthetics and design describe all items of application. User-friendly chapter describes intuitive and functional control of application. Privacy section is about restriction in provided maps. Help and documentation tests if is everything uncertain is explained there. Skills and usability control and freedom mean easy using of application.

The last group is about list of maps. This list must be very easy for use to find all necessary maps. In the end of article is how to evaluate and write final report.

Key Words: *GeoWeb, usability testing, heuristic evaluation, heuristic*

JEL Classification: *H83*