Browsing Information Tags Space

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Software systems process information whose amount is growing exponentially thanks to the advent of the Internet. We have found out recently, that it is no longer enough for us to store the data, but we need something more. To be able to organize and effectively browse stored information, we use metadata (data about data), which can provide information describing what data are about, describe their structure, or give us additional information about the user who created them and how they were created. Information tags, an example of metadata types, contain structured information associated with a particular piece of content, such as the number of clicks on the link in a page, keyword characterizing paragraph in the article or the number of lines of method's source code.

Adding metadata to our content has various advantages. Their importance lies in ability to store, organize and provide information about the data whom they are assigned to. This gives us simpler and faster searches in metadata. Metadata can also allow a better understanding of the data and display the data change over the time.

Metadata are usually generated and processed by machine, and their amount makes it difficult for people to effectively read and understand them. There are various problems with users' comprehension of data. However, since the metadata can contain valuable information about the content, as well as the users working with it, it is important to enable users to understand and analyze this information. To ensure readability and understandability we can use navigation of user through the data with the help of their visualization. Visualization helps us to understand the huge amount of data and allows us to navigate within them more easily. Research methods are therefore dealing with how to handle metadata and how to navigate users through them.

Our work is focused on information tags connected to source code, which give us additional information about the code, for example rating of method, or bug in a class. These tags represent characteristics of source code, which they are assigned to. Main disadvantage is that characteristics are scattered around the project and so far there is no option of their easy browsing besides text search. For user, that can be for example

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Spring 2014 PeWe Workshop, March 21, 2014, pp. 79–80.

student of the subject Team project, these data are really valuable. They can be used to revise his source code, or to check the work of other team members.

Therefore we propose a method to support browsing information tags that are assigned to the source code. The proposed method combines the visualization of source code using fisheye view, visualization of information tags and filtering of shown space of tags using faceted browser. Through combination of these tools we are creating system for user navigation that enables easier searching of source code with selected characteristics.

Amount of information tags in system depends on the size of the project and the willingness of users to enter them manually. Growth of project increases the number of these tags and at some point, visualization of these tags become unusable. Faceted browser allows user to search in information tags that are connected to source code and filter space of these tags and therefore filter space of source code. Different values of facets represent possible values of information tags or ranges of these values. Using faceted browser, user can define search queries by selecting different values of facets. Facets and their possible values are defined in system fixedly, and they depend on type of tags that can be found in the system.

Information tags can be connected to a line or several lines of source code. Source code is divided into projects, packages, classes and methods that create tree of nodes, with relationships between them. We visualize this source tree using fisheye view, which scales the space and enlarges the nodes that are interesting for user. We enlarge nodes that meet the search query, defined by user in faceted browser. Other nodes of tree are shown to the user to preserve context and overview of project.

We visualize the information tags on multiple levels - not only at the place, they were created, but also at individual nodes, by aggregating values of tags of the same type in subnodes. This offers better overview not only about information tags, but also about their values throughout the project.

Acknowledgement. This contribution is the partial result of the Research & Development Operational Programme for the project Research of methods for acquisition, analysis and personalized conveying of information and knowledge, ITMS 26240220039, co-funded by the ERDF.

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