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Software search and software catalogs survey

Your answers to this survey's questions will help us understand some of the approaches people use to find software today, and some of the facilities that could help people find software more easily in the future.

Your identity will be kept confidential, even when we publish articles about the results of this survey. To proceed, however, we need your explicit consent allowing us to store and use your replies to this survey. Please read the document located at http://goo.gl/q6yN4U and indicate whether you consent below. (Note: the document covers more cases than this survey – you can safely ignore parts dealing with interviews and requesting signatures.)

This survey has up to 5 pages. The number of pages varies based on answers given to the questions.

* Required

Voluntary consent *

By checking the box below, you indicate that (1) you have read the informed consent form document linked above and (2) you consent to us using your responses to this survey in both our research and our future publications.

- [ ] I give my consent

What is your name?

This information will be kept confidential. We ask for your name (1) because the answer to the previous question must be associated with each individual, and (2) so that we know how to address you if we communicate with you via email or other means.

What is your email address?

This information will be kept confidential. We will not release your email address or other identifying information publicly, and we will not put your email address on any mailing list. This information is so that we can contact you if necessary.

What is your primary field of work?

If work in multiple fields or across field boundaries, you may select more than one option from this list.

- [ ] Biology and Biological Engineering
- [ ] Chemistry and Chemical Engineering
- [ ] Cognitive and Brain Sciences
- [ ] Computing and Mathematical Sciences
- [ ] Geological and Planetary Sciences
- [ ] Physical Sciences
- [ ] Social Sciences

☐ Other:

In your work, on a typical day, approximately what fraction of your time involves using or interacting directly with software on a computer or other computing device?

For most people, all work done with a computer or computing device involves interacting with software, because web browsers, editors, etc., are all software systems. However, not all work involves computer work. The purpose of this question is to try to understand how computer-intensive your own work is.

In your work, how much freedom do you have to choose the software you use?

This refers to situations where you use ready-to-run software, rather than when you write software. In other words, it is about the software applications and environments you use. The possibilities range from having no choice (perhaps because you are required to use pre-selected software) to having complete autonomy (perhaps because there are no policies or guidelines, or because it is your responsibility to make the choices for yourself or for others).

- ○ I never get to choose the software I use
- ○ Sometimes I get to choose the software I use
- ○ Half the time, a situation or task requires using preselected software, and other times I get to choose
- ○ More often than not, I choose the software I use
- ○ I always choose the software I use

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Questions for software users

When you need to find ready-to-run software for a particular task, how do you go about finding software?

Note that this is about using software rather than developing software, so searching for software here does not necessarily imply searching for source code. Please select all that apply.

- [ ] Use whatever is determined by my organization or work group's guidelines or practices
- [ ] Ask colleagues for opinions
- [ ] Ask or search mailing lists or discussion groups within your organization
- [ ] Ask or search public mailing lists or discussion groups
- [ ] Look in the scientific literature to find what authors use in similar contexts
- [ ] Ask or search social media (e.g., Twitter, Facebook, LinkedIn, etc.)
- [ ] Ask or search social help sites (e.g., StackOverflow, Quora, etc.)
- [ ] Search the web using general-purpose search systems (e.g., Google, Yahoo, Bing, DuckDuckGo)
- [ ] Search in topical software indexes/catalogs (e.g., ASCL.net, BioPortal, Alternative.to, etc.)
- [ ] Search in public software project repositories (SourceForge, GitHub, BitBucket, etc.)
- [ ] Other:

Please describe one past scenario when you looked for ready-to-run software for some task.

Please address details such as: What were you trying to find? What information sources did you use to find the source code? How did you formulate your questions or queries? What criteria did you use to decide on the best match? Were you successful in finding the software you were looking for?

In general, how important are the following characteristics when you are searching for ready-to-run software for a task?

Please rank the following according to the importance of each to you. If the criteria change depending on the occasion, please indicate the criteria that represent what you most often use.

	Rarely or never important	Somewhat or occasionally important	Average importance	Usually of above-average importance	Essential

Availability of specific features	○	○	○	○	○
Availability of source code	○	○	○	○	○
Support for specific data standards and file formats	○	○	○	○	○
How easy the software is to learn	○	○	○	○	○
How easy the software is to extend	○	○	○	○	○
Apparent quality of the software	○	○	○	○	○
Reputation of the developers	○	○	○	○	○
Quality of support for the software	○	○	○	○	○
Quality of documentation	○	○	○	○	○
Other people's opinions	○	○	○	○	○
Speed/performance of the software	○	○	○	○	○
Operating system requirements	○	○	○	○	○
Hardware compatibility and requirements	○	○	○	○	○
Similarity to other software you used	○	○	○	○	○
Programming language(s) used in implementation	○	○	○	○	○
Software architecture	○	○	○	○	○
Size of software	○	○	○	○	○
Price	○	○	○	○	○
License terms for usage	○	○	○	○	○
License terms for source code	○	○	○	○	○

Suppose that it were possible to create a public, searchable catalog or index of software, one that would record information about software of all kinds found anywhere. What kind of information would you find most useful to include for each entry in such a catalog or index?

Please check all that apply. If you think of others, please write them in the "Other" slot.

- ☐ Name of software

- [ ] Domain of application
- [ ] Purpose of software
- [ ] Data formats supported
- [ ] License terms of software
- [ ] Operating system(s) supported
- [ ] Software libraries needed
- [ ] Programming language(s) software is written in
- [ ] How recently has the software been updated
- [ ] How active development appears to have been over time
- [ ] Availability of support or help
- [ ] Availability of public issue/bug tracker
- [ ] Availability of discussion lists/forums
- [ ] Code base includes test cases
- [ ] Code base is well commented
- [ ] Programmable API is available
- [ ] Workflow environments supported
- [ ] Type(s) of user interfaces (e.g., GUI)
- [ ] Whether source code is available
- [ ] Whether a publication is associated with the software
- [ ] Software quality metrics
- [ ] URL for software's home page
- [ ] Other:

Are you involved in software development?

For the purposes of this question, it does not matter whether you do it alone or as part of a team or group.

- ( ) Yes
- ( ) No

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Questions for software developers

For how many years have you been developing software?

For the purposes of this question, please count all your lifelong software experiences, whether for your work or for personal projects.

In your current (or most recent) software development project, what is (or was) your primary responsibility?

People often have more than one role on a project, but here we are asking about what would be considered your main role on the project. If you equally committed to two or more roles, please pick the one for which you feel the greatest affinity.

- ○ Project management
- ○ Requirements analysis
- ○ Software architecture
- ○ Software development
- ○ Testing/quality assurance
- ○ Technical writing
- ○ Deployment
- ○ Training
- ○ Other:

What is the typical team size of projects that you are involved with?

Here are are interested in all efforts you have been involved with, whether open-source or proprietary, and whether related to your current work or not.

- ○ Small (1–5 people)
- ○ Medium (6–25 people)
- ○ Large (more than 25 peple)
- ○ Other:

Which programming and/or scripting language(s) have you had the most experience with?

Please select up to 3 languages with which you are most experienced.

- ☐ C
- ☐ C++

- [ ] C#
- [ ] Delphi/Pascal/Object Pascal
- [ ] F#
- [ ] Fortran
- [ ] IDL
- [ ] Java
- [ ] JavaScript
- [ ] Lisp
- [ ] Mathematica
- [ ] MATLAB/Octave
- [ ] Objective-C
- [ ] Perl
- [ ] PHP
- [ ] Python
- [ ] R
- [ ] Ruby
- [ ] SQL
- [ ] Shell scripting (Unix/Linux/MacOS)
- [ ] Visual Basic
- [ ] Windows batch file scripting
- [ ] Other:

How often do you search online for software source code?

- ( ) Never
- ( ) Rarely – once every few months
- ( ) Once per month
- ( ) Once per week
- ( ) Every day
- ( ) Many times per day

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Questions for developers who search for source code

What are some reasons why you look for source code (when you do look)?

Please check all that apply.

- [ ] To reuse code as-is
- [ ] To find code examples of how specific APIs are used
- [ ] To find examples of how to implement a particular algorithm, data structure or approach
- [ ] To find a more efficient approach to something you have already written
- [ ] To remember syntactic details or infrequently used functionality
- [ ] To discover new algorithms or data structures
- [ ] To learn unfamiliar concepts
- [ ] To confirm or refute that some given software has a defect/bug
- [ ] Other:

What are some approaches you have used to look for source code in the past?

Please select all that apply.

- [ ] Ask colleagues for suggestions
- [ ] Ask or search mailing lists or discussion groups within to your organization
- [ ] Ask or search public mailing lists or discussion groups
- [ ] Look in the scientific literature to find what authors use in similar contexts
- [ ] Ask or search social media (e.g., Twitter, Facebook, LinkedIn, etc.)
- [ ] Ask or search social help sites (e.g., StackOverflow, Quora, etc.)
- [ ] Search the web using specialized code search engines (e.g., OpenHUB, Krugle, Snipplr, Smipple, etc.)
- [ ] Search the web using general-purpose search systems (e.g., Google, Yahoo, Bing, DuckDuckGo)
- [ ] Search in public software project repositories (SourceForge, GitHub, BitBucket, etc.)
- [ ] Search in specialized software indexes/catalogs (e.g., ASCL.net, BioPortal, Alternative.to, etc.)
- [ ] Search in my organization's code collection or repository (if any)
- [ ] Other:

Please describe one scenario when you were looking for source code.

Please address details such as: What were you trying to find? How did you formulate your queries? What information sources did you use to find the source code? Which implementation language were you working with? What criteria did you use to decide on the best match?

What are some factors that have hindered your ability to FIND source code in the past?

Please check all that apply.

- [ ] Lack of time to do a proper search and/or evaluate the results
- [ ] Unable to locate any suitable or working software source code for my purposes
- [ ] Concerns about intellectual property issues
- [ ] Lack of trust in the options found
- [ ] My specific requirements were too unique
- [ ] Using 3rd-party source code is prevented by policies
- [ ] Other:

If you searched and found source code in the past, what are some factors that may have prevented you from REUSING the source code you found?

You may have searched for source code in the past but not ended up being able to use what you found. What were some of the reasons? Please check all that apply.

- [ ] Incompatible licensing terms
- [ ] Incompatible implementation language
- [ ] Incompatible API
- [ ] Incompatible operating system or other requirements
- [ ] Inability to compile source code
- [ ] Poor code quality
- [ ] Poor code modularity
- [ ] Poor documentation or lack of documentation
- [ ] Poor software performance
- [ ] Lack of support for desired standards
- [ ] Lack of needed functionality
- [ ] Incomprehensible algorithm
- [ ] Inadequate verification and/or testing of code
- [ ] Insufficient developer or vendor support
- [ ] Unsuitable cost/price
- [ ] Source code too large
- [ ] Other:

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* Required

Thank you!

Thank you very much for taking the time to complete this survey.

May we contact you again to ask other questions in the future? *

For the purposes of this project only, we may want to ask further questions or even interview some respondents. You are under no obligation to accept, and even if you respond "yes" here, you can decline in the future.

- ◯ Yes
- ◯ No

We welcome your opinion about this survey – please let us know what you thought of it.

If you have any feedback (for example, you liked it, or you thought of some additional points to make, or were confused by some questions, or hated some part of it, or thought the whole thing was stupid, or whatever), please don't hesitate to write it here. We really want to know, and you can be completely honest here. We want to know!

Contact

If you have any questions, feedback, or other communications, please don't hesitate to email us at the following addresses:

Michael Hucka – mhucka@caltech.edu
Matthew Graham – mjg@caltech.edu

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