

# C++ Package Managers

This research concerns the use of package managers and factors that may influence their adoption in C++ open source projects.

Your participation is voluntary, welcomed, and you may be assured of complete confidentiality, no kind of identification will be obtained without your knowledge (name, ip address, etc.). Answers to objective questions (numerical or multiple choice) data will be reported only in the aggregate. Open-ended answers may be anonymously disclosed in scientific documents.

Entering your e-mail is optional and will be requested only: if you want to enter the giveaway of three \$10 Amazon vouchers; or if you are willing to be contacted to answer additional questions.

**In any case no individual will be identified in eventual publications of the research results.**

The estimated answering time for this questionnaire is 10 minutes. This research is conducted by Andre Miranda (graduate researcher) and Prof. Ph.D. Joao Pimentel. In case of doubts and suggestions please contact Andre at [aldm@ecomp.poli.br](mailto:aldm@ecomp.poli.br).

There are 29 questions in this questionnaire.

**Thank you for your contribution!**

There are 35 questions in this survey

## About you and the project

Page 1 of 2

### [1] - How old are you? \*

Please choose **only one** of the following:

- ☐ 24 years old or less
- ☐ 25 - 34 years old
- ☐ 35 - 44 years old
- ☐ 45 - 54 years old
- ☐ 55 years old or more
- ☐ I prefer to keep it a secret

### [2] - Does your current main job require coding skills? \*

Please choose **only one** of the following:

- ☐ Yes
- ☐ No, but I used to code in a previous work
- ☐ No and I never had to code in work

### [3] - How many years of experience do you have as a programmer (any language)? \*

Please choose **only one** of the following:

- ☐ 1 year or less
- ☐ 1 ~ 3 years
- ☐ 3 ~ 5 years
- ☐ 5 ~ 10 years
- ☐ 10 ~ 15 years
- ☐ 15 years or more

**[]4 - How many years of experience do you have as a C++ programmer? \***

Please choose **only one** of the following:

- ☐ 1 year or less
- ☐ 1 ~ 3 years
- ☐ 3 ~ 5 years
- ☐ 5 ~ 10 years
- ☐ 10 ~ 15 years
- ☐ 15 years or more

**[]5 - Which of the following projects do you contribute to? \***

Please choose **only one** of the following:

- ☐ Aseprite
- ☐ Audacity
- ☐ Bosen
- ☐ cegui
- ☐ Ceph
- ☐ Chromium
- ☐ Clementine
- ☐ CuteMarkEd
- ☐ DeepDetect
- ☐ EventQL
- ☐ Firefox
- ☐ FreeCAD
- ☐ goldendict
- ☐ GParted
- ☐ Hydrogen
- ☐ Kiwix
- ☐ Kodi

- ☐ LibreOffice
- ☐ LiveCode
- ☐ Inav
- ☐ Lyx
- ☐ Mapnik
- ☐ Minetest
- ☐ Miranda NG
- ☐ Mixxx DJ
- ☐ MongoDB
- ☐ Nanogui
- ☐ Natron
- ☐ Newsbeuter
- ☐ OpenCV
- ☐ OpenImageIO
- ☐ OpenSCAD
- ☐ PSI
- ☐ RedisDesktopManager
- ☐ RethinkDB
- ☐ Scylla
- ☐ Simultrans
- ☐ SolveSpace
- ☐ stepmania
- ☐ SuperTuxKart
- ☐ Synfig
- ☐ Tesseract
- ☐ Tomahawk
- ☐ Torque2D
- ☐ TortoiseGit
- ☐ Warzone2100

If you contribute to more than one project, please answer this survey only for the project you have contributed more in the last year.

**[]6 - Describe your participation in this project: \***

Please choose **only one** of the following:

- ☐ It is part of my job
- ☐ It is a hobby

☐ Other

**[]7 - How would you describe your roles in this project? \***

Please choose **all** that apply:

- ☐ Lead Developer
- ☐ Core Developer
- ☐ Occasional Developer
- ☐ QA/Tester
- ☐ Release Manager
- ☐ DevOps
- ☐ Evangelist
- ☐ Documentation Writer
- ☐ Translator
- ☐ Other:

**[]8 - When was your first contribution to this project? \***

Please choose **only one** of the following:

- ☐ 3 months ago or less
- ☐ 3 ~ 12 months ago
- ☐ 1 ~ 3 years ago
- ☐ 3 years ago or more

**[]9 - How would you rate the steps to set up this project and start coding?  
Consider things such as installing tools, libraries, compiler settings, etc. \***

Please choose **only one** of the following:

- ☐ Very Easy
- ☐ Easy
- ☐ Somewhat Easy
- ☐ Somewhat Difficult
- ☐ Difficult
- ☐ Very Difficult

**[]10 - Which operating systems did you use while working on this project? \***

Please choose **all** that apply:

- ☐ BSD

- ☐ Linux
- ☐ OS X / macOS
- ☐ Windows
- ☐ Other:

**[11 - While working on this project, did you need to use a package manager in order to install dependencies (libraries)? \***

Please choose **only one** of the following:

- ☐ Yes, the system package manager (apt-get, yum, macports...)
- ☐ Yes, a language-specific package manager (PIP, NPM, Conan...)
- ☐ Yes, both kinds of package managers
- ☐ No

**[12 - How satisfied are you with the current way dependencies are handled in this project? \***

Please choose **only one** of the following:

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

**[13 - Regarding difficulties you may have faced when building the project, to what extent do you agree or disagree with each of the following statements? \***

Please choose the appropriate response for each item:

	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
There were problems related to the operating system I used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There were problems related to the build system settings (CMake, Autotools...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The project build configuration was/is a burden to maintain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Setting up the project and building was/is complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The build system is not compatible with my preferred IDE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**[]14 - Based on your personal experience with the project, to what extent do you agree or disagree with each of the following statements? \***

Please choose the appropriate response for each item:

	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Finding out what are the necessary libraries was complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Retrieving or building the necessary libraries was complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Library version conflicts were/are recurrent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Linking problems were/are recurrent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adding and/or maintaining dependencies was/is troublesome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to have added/add more libraries but the effort was/is not worthwhile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People working on the project avoid to add new dependencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Package Managers

Page 2 of 2

### [15 - Besides C++, which other language(s) do you use often? \*

Please choose **all** that apply:

- ☐ I don't use any language besides C++
- ☐ C
- ☐ Objective-C
- ☐ D
- ☐ C#
- ☐ Elixir
- ☐ Haskell
  
- ☐ Java
- ☐ JavaScript
- ☐ Python
- ☐ Ruby
- ☐ Rust
- ☐ Go
- ☐ PHP
  
- ☐ Visual Basic / Visual Basic .NET
- ☐ Perl
- ☐ Delphi / Pascal
- ☐ Swift
- ☐ Scala
- ☐ Groovy
- ☐ Other:

### [16 - In the last 3 months, how often did you use language-specific package managers (NPM, RubyGems, PIP...) while developing in other languages besides C++ such as JavaScript, Ruby, Python, etc? \*

**Only answer this question if the following conditions are met:**

Answer was at question '15 [B1]' (15 - Besides C++, which other language(s) do you use often?)

Please choose **only one** of the following:

- ☐ Always
- ☐ Very often

- ☐ Fairly often
- ☐ Sometimes
- ☐ Almost never
- ☐ Never
- ☐ I don't know what is a package manager

**[]17 - In the last 3 months, which of the following package managers did you use regularly? \***

Please choose **all** that apply:

- ☐ I don't use any package manager regularly
- ☐ Bower
- ☐ Cabal/cabal-install
- ☐ Cargo
- ☐ CocoaPods
- ☐ Composer
- ☐ CPAN
- ☐ CRAN
- ☐ CTAN
- ☐ EasyInstall
- ☐ goget
- ☐ Gradle
- ☐ Ivy
- ☐ Leiningen
- ☐ LuaRocks
- ☐ Maven
- ☐ npm
- ☐ NuGet
- ☐ PIP
- ☐ RubyGems
- ☐ sbt
- ☐ Other:

**[]18 - What is your stance regarding language-specific package managers (NPM, PIP, RubyGems)? \***

Please choose **only one** of the following:



- ☐ Pro
- ☐ Against
- ☐ I don't know

**[19 - Please explain the stance you selected in the previous question: \***

Please write your answer here:

**[20 - Please choose the FIVE most important features that could POSITIVELY influence your use of a package manager tool. \***

Please select 5 answers

Please choose **all** that apply:

- ☐ Manage multiple versions of a dependency (library)
- ☐ Good documentation
- ☐ Central repository
- ☐ Easy to install the tool
- ☐ Handle transitive dependencies
- ☐ Good availability of libraries
- ☐ Open source license
- ☐ Handle dependency conflicts
- ☐ Easy to set up and to maintain its configuration
- ☐ Broad adoption on many other projects
- ☐ Easy to integrate with current build configuration
- ☐ Decentralized repository
- ☐ Easy to publish packages
- ☐ Easy and Hassle-free install/update of libraries
- ☐ Free of cost (not necessarily open source)
- ☐ Commercial support

☐ Other:

**[]21 - Please choose the FIVE most important features that could NEGATIVELY influence your use of a package manager tool. \***

Please select 5 answers

Please choose **all** that apply:

- ☐ Bugs compromise its use
- ☐ Low adoption on other projects
- ☐ It builds the project instead of just handling dependencies
- ☐ One more configuration to maintain
- ☐ The tool is written in a language that requires a runtime
- ☐ Insufficient documentation
- ☐ Too much opinionated / Lack of flexibility
- ☐ Difficult to publish packages
- ☐ Low availability of libraries
- ☐ Configuration is too complicated
- ☐ It only handle dependencies, it doesn't build
- ☐ The tool is not written in C/C++
- ☐ The tool requires me to change the current build system
- ☐ It's not compatible with my preferred IDE
- ☐ Closed/commercial software
- ☐ Other:

**[]22 - What do you think about starting a new project (any language) without the support of a language-specific package manager (e.g. NPM, Maven, RubyGems)? \***

Please choose **only one** of the following:

- ☐ I would not start the project, dependency management is essential for me
- ☐ I would not feel comfortable, but I would not hold back the project's start
- ☐ It is not a problem, I could make use of a tool later
- ☐ It is not a problem, this can be handled without a tool

**[]**

## **C++ Dependency Management**

The following questions are specific for dependency management in C++ projects.

**[]23 - What is your current preferred way to add a new library (dependency) to a C++ project? \***

Please choose **only one** of the following:

- ☐ Header-only libraries
- ☐ Amalgamation libraries
- ☐ Library sources in the repository
- ☐ Git submodules
- ☐ System package manager
- ☐ C++ package manager
- ☐ Manually compile and install libraries
- ☐ Custom script to fetch and install libraries
- ☐ Use precompiled packages

Hover the mouse cursor over the options to see a description.

**[]24 - What are your preferred build systems for C++ projects? \***

Please choose **all** that apply:

- ☐ Autotools
- ☐ Bazel
- ☐ CMake
- ☐ GN
- ☐ Gradle
- ☐ GYP
- ☐ make
- ☐ Meson
- ☐ ninja
- ☐ IDE-based build (Visual Studio, XCode...)
- ☐ Premake
- ☐ qmake
- ☐ SCons
- ☐ WAF
- ☐ Other:

**[]25 - How often have you used C++ package managers (e.g. Conan, Hunter, Biicode...)? \***

Please choose **only one** of the following:

- ☐ I don't know what is a package manager  
☐ Never  
☐ Rarely (in less than 10% of the chances when I could have)  
☐ Occasionally (in about 30% of the chances when I could have)  
☐ Sometimes (in about 50% of the chances when I could have)  
☐ Frequently (in about 70% of the chances when I could have)  
☐ Usually (in about 90% of the chances I could have)  
☐ Every time

**[26 - Overall, how satisfied are you with the tools below? \***

Please choose the appropriate response for each item:

	I don't know this tool	I know but never used this tool	Completely Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Completely Satisfied
Biicode	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Build2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CPM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hunter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meson	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pacm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yotta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**[27 - If you have used another C++ package manager that is not listed above please let us know its name.**

Please write your answer here:

**[28 - Regarding the use of C++ package managers, to what extent do you agree or disagree with each of the following statements? \***

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I would like to use a C++ package manager in {INSERTANS:1X9X284}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could give up my preferred build system if the use of a C++ package manager required so	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I could give up my preferred IDE if the use of a C++ package manager required so	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to split the source code into modules and integrate them by using a C++ package manager	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would use C++ package managers if they were as mature as are the ones for other languages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**[]29 - Would you like to use a C++ package manager for {INSERTANS:1X9X284}? What about your C++ your personal projects? Would you like to use a package manager for C++ just as it is possible with other languages? If you have already tried a C++ package manager, what are the aspects that you liked and what do you think should be improved? Please share your thoughts.**

Please write your answer here:

[ ]

## Thank you

**[]Would you like to receive a copy of the results of this study after its publication? \***

Please choose **only one** of the following:

- ☐ Yes
- ☐ No

**[]Would you be available for a follow-up interview (only a fraction of the participants will be interviewed)? \***

Please choose **only one** of the following:

- ☐ Yes  
☐ No

**[]Would you like to participate in the giveaway of three \$10 Amazon vouchers?**  
**\***

Please choose **only one** of the following:

- ☐ Yes  
☐ No

**[]Please enter your e-mail.**

**We will not use your e-mail to vinculate to answers and certainly we will not disclose this information to third parties.**

**Your views and opinions will be fully anonymized once this study becomes published.**

**\***

**Only answer this question if the following conditions are met:**

**((C1.NAOK == "Y") or (C2.NAOK == "Y") or (C3.NAOK == "Y"))**

Please check the format of your answer.

Please write your answer here:

09-29-2016 – 03:15

Submit your survey.  
Thank you for completing this survey.