

## Crowdsourcing: Newer definition

- Crowdsourcing is a type of **participative online activity** in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the **voluntary undertaking of a task.**
- The undertaking of the task, of variable complexity and modularity, and in which the crowd should participate bringing their work, money, knowledge and/or experience, **always entails mutual benefit.**
- The **user will receive the satisfaction** of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, **while the crowd-source organization** will obtain and utilize to their advantage what the user has brought to the venture, whose form will depend on the type of activity undertaken.

Estellés-Arolas, E., & González-Ladrón-de-Guevara, F. (2012). Towards an integrated crowdsourcing definition. *Journal of Information science*, 38(2), 189-200.

# Crowdsourcing: The typical crowdsourcing process






## The Crowdsourcing Process *In Eight Steps*



Image by Daren C. Brabham | [www.darenbrabham.com](http://www.darenbrabham.com)

# Crowdfunding

- Crowdsourcing is the sourcing of anything from a crowd
- Crowdfunding is the sourcing of funds from a crowd - a specific type of crowdsourcing.

Platform	Total Raised	Supporters	Platform Fee	Payment Fee	Important to Know
 GoFundMe	\$25B	50M	0%	2.9% + \$0.30	<ul style="list-style-type: none"> <li>✓ Can quickly set up withdrawals and deposits take an average of 2-5 business days</li> <li>✓ Coaching and account support throughout the fundraising and donation process</li> <li>✓ Easy to use fundraising tools make setup fast (e.g., mobile app and superior add beneficiary feature)</li> <li>✓ The GoFundMe Giving Guarantee – in the very rare case that something isn't right with a fundraiser, donors may be eligible for a 100% refund of their donation</li> </ul>
 Indiegogo	\$1.5B	10M	5%	3.0% + \$0.30	<ul style="list-style-type: none"> <li>✓ Offers "flexible funding"</li> <li>✓ Specializes in technology and hardware product launches</li> <li>✓ Regular email support hours; marketing and campaign strategy support</li> </ul>
 Kickstarter	\$3B	15M	5%	3.0% + \$0.20	<ul style="list-style-type: none"> <li>✓ Specializes in creative projects with robust reward level feature</li> <li>✗ 14-day wait to withdraw and deposits take 5-7 business days</li> <li>✗ Limited email support hours</li> <li>✗ Requires Kickstarter approval to launch a fundraiser</li> </ul>
 Fundly	\$330M	NA	4.9%	2.9% + \$0.30	<ul style="list-style-type: none"> <li>✓ Can withdraw immediately and deposits take 2-5 business days</li> <li>✗ No donor guarantee policy for fraud protection</li> <li>✗ Limited email support hours</li> </ul>
 JustGiving	NA	22M	Nonprofits: 0-5% Personal: 0%	Nonprofits: 2.9% Personal: 2.9% + \$0.30	<ul style="list-style-type: none"> <li>✓ Supports UK gift aid</li> <li>✗ 14-day wait to withdraw and deposits take 6-10 business days</li> <li>✗ No fraud protection offered</li> <li>✗ Limited email support hours</li> </ul>

<http://www.crowdfunding.com/>

# Why do people engage with crowdsourcing?

Many reasons including:

- “the desire to earn money;
- to develop one’s creative skills;
- to network with other creative professionals;
- to build a portfolio for future employment;
- to challenge oneself to solve a tough problem;
- to socialize and make friends;
- to pass the time when bored;
- to contribute to a large project of common interest;
- to share with others; and
- to have fun.”

Brabham, D. C. (2012). Crowdsourcing: A model for leveraging online communities. In *The participatory cultures handbook* (pp. 120-129). Routledge.

# Types of Crowdsourcing (Brabham, 2011)

Type	How it Works	Kinds of Problems	Examples
Knowledge Discovery and Management	Organization tasks crowd with <u>finding and collecting information into a common location and format</u>	Ideal for <u>information gathering</u> , organization, and reporting problems, such as the creation of collective resources	Peer-to-Patent <i>peertopatent.org</i>  SeeClickFix <i>seeclickfix.com</i>
Broadcast Search	Organization tasks crowd with <u>solving empirical problems</u>	Ideal for ideation problems with <u>empirically provable solutions</u> , such as <u>scientific problems</u>	InnoCentive <i>innocentive.com</i>  Goldcorp Challenge <i>Defunct</i>
Peer-Vetted Creative Production	Organization tasks crowd with <u>creating and selecting creative ideas</u>	Ideal for ideation problems where solutions are matters of <u>taste or market support</u> , such as <u>design or aesthetic problems</u>	Threadless <i>threadless.com</i>  Doritos Crash the Super Bowl Contest <i>crashthesuperbowl.com</i>  Next Stop Design <i>nextstopdesign.com</i>
Distributed Human Intelligence Tasking	Organization tasks crowd with <u>analyzing large amounts of information</u>	Ideal for large-scale data analysis where <u>human intelligence is more efficient or effective than computer analysis</u>	Amazon Mechanical Turk <i>mturk.com</i>  Subvert and Profit <i>subvertandprofit.com</i>

[SeeClickFix | 311 Request and Work Management Software](#)

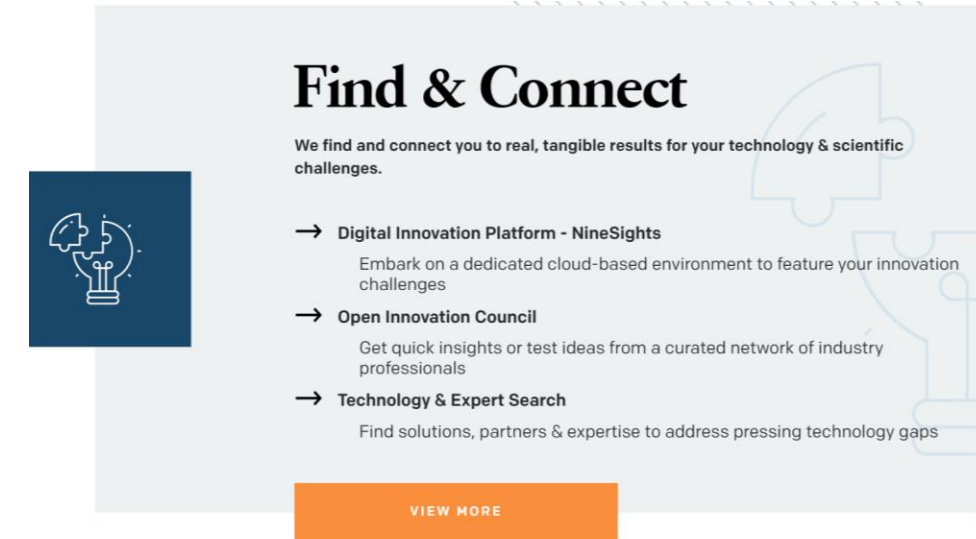
[Challenges – Wazoku](#) (now Wazoku)

[Threadless](#)

[Amazon Mechanical Turk](#)

# Crowdsourcing for innovation: Another typology

- **Intermediary platforms**
  - Research & Development platforms (e.g. Innocentive, NineSigma)
  - Marketing, Design & Idea platforms (e.g. 99designs)
  - Collective intelligence & Prediction platforms (e.g. Kaggle)
  - HR and Freelancers platforms (e.g. TopCoder, Amazon Mechanical Turk)
  - Open innovation software
  - Intermediary open innovation services



[Contribute to open innovation - We make innovation happen | NineSigma](#)

**99designs**  
by vista

[Categories](#) [How it works](#) [Find a designer](#) [Inspiration](#) [Studio](#)

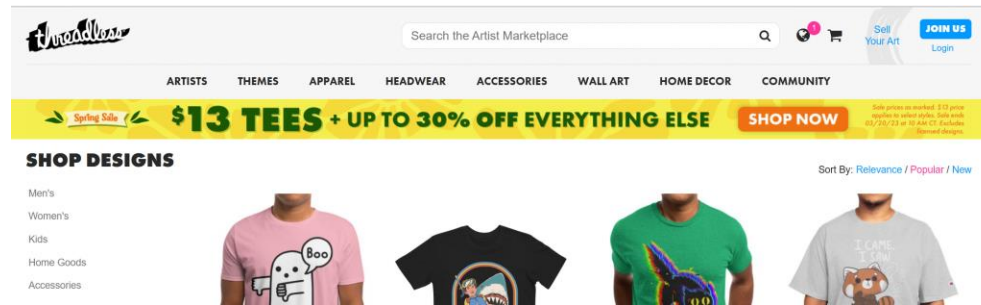
<https://99designs.com.au/>



# Crowdsourcing for innovation: Another typology (Cont.)

- **Creative co-creation**

- E.g. **Threadless**, [Custom Tattoo Design Contests & Tattoo Ideas | CreateMyTattoo.com](#)



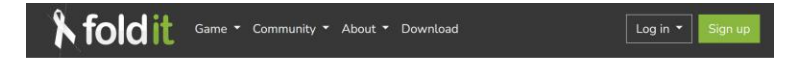
[Browse Designs | Threadless](#)

- **Corporate initiatives**

- Product ideas crowdsourcing (e.g. IBM InnovationJam [IBM InnovationJam® - Overview | IBM](#))
    - *What began as an internal experiment in 2001... is now a proven management tool for driving innovation and collaboration. IBM's InnovationJam® offering is ideal for companies and enterprises looking to kick-start a transformation or change program through a transparent 'conversation'.*
  - Branding and Design crowdsourcing (e.g. Fluevog)

# Crowdsourcing for innovation: Another typology (Cont.)

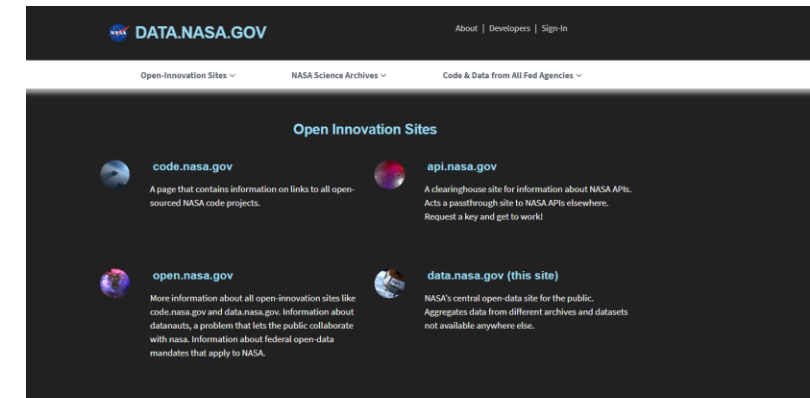
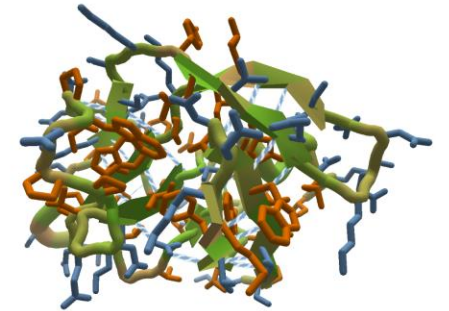
- **Peer production**
  - E.g. Linux, Wikipedia
- **Public crowdsourcing**
  - E.g.
  - Fold it - a revolutionary crowdsourcing computer game enabling you to contribute to scientific research. Learn the science behind Foldit and how your playing can help.
- Nasa Open Innovation



Foldit is a revolutionary crowdsourcing computer game enabling you to contribute to scientific research. Learn the science behind Foldit and how your playing can help.

[About Foldit](#) [Start Playing](#)

<https://fold.it/>



Other NASA Data Sites and Science Archives

Additionally, NASA has a number of data archives, often geared around providing the public with datasets from a particular domain, field of science, or mission. Lastly, there are also open-data and open-code aggregator sites that collect open-data and open-code from across all federal government agencies; code.gov and data.gov. Both of these have some APIs for working with their datasets that make them worth checking out even if you're strictly interested in NASA data.

[Open Innovation | NASA](#)



## What is ‘Open Data’?

“Open means anyone can **freely access, use, modify, and share** for **any purpose** (subject, at most, to requirements that preserve provenance and openness).”

Put most concisely:

“Open data and content can be freely used, modified, and shared by anyone for any purpose”

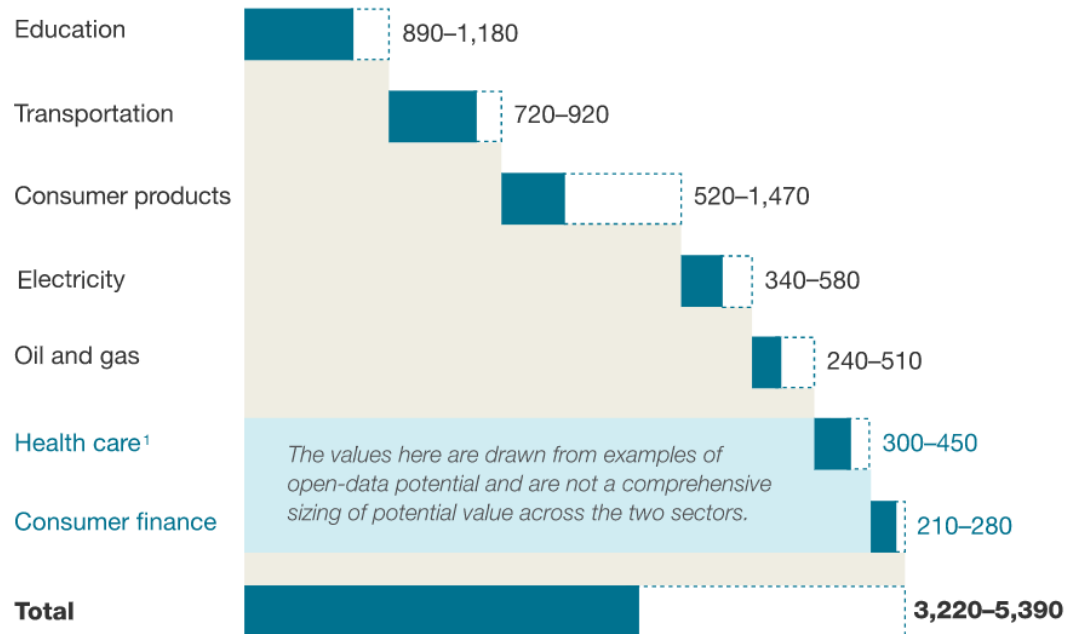
<https://opendefinition.org/>

# Value in Open Data

Exhibit

**Open data can help unlock \$3 trillion to \$5 trillion in economic value annually across seven sectors.**

Potential value in open data, \$ billion



<sup>1</sup>Includes US values only.

Source: McKinsey Global Institute analysis

- **Economic value** e.g. increased efficiency, new products and services, and a consumer surplus (cost savings, convenience, better products)
- **Big data's impact** e.g., replacing or supporting human decision making
- **Business opportunities** e.g., new products and services
- **Governments to play a central role**

<https://opendatatoolkit.worldbank.org/en/data/opendatatoolkit/starting> (Mar'25)

## Value in Open Data – Self-reinforcing cycle

- The benefits of open data can be **self-reinforcing**: they will increase as **individuals perceive the advantages and help to improve the accuracy and detail of the information available.**
- However, this cycle can gather momentum only if **private industries and public agencies cultivate a vibrant open-data ecosystem** and implement policies to protect stakeholders.
- For companies, that means putting in place the **technologies and talent to collect and analyze data.**
- For individuals—as both consumers and citizens – it means **being vigilant, savvy providers and users of open data.**

# What is Free Software?

## (using Free Software Foundation definition)

- “Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it means that the program's users have the four essential freedoms:
  - The freedom to run the program, for any purpose (freedom 0).
  - The freedom to study how the program works, and change it to make it do what you wish (freedom 1). Access to the source code is a precondition for this.
  - The freedom to redistribute copies so you can help your neighbour (freedom 2).
  - The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this. “

Source: <http://www.gnu.org/philosophy/free-sw.html>

## “Copyleft”

- Play on word “copyright”
- “Copyleft is a general method for making a program (or other work) free, and requiring all modified and extended versions of the program to be free as well.” (Free Software Foundation)
- Example of a copyleft licence is the GNU Public License (GPL)
  - More in later lectures

<http://www.gnu.org/copyleft/>

Copyright is a legal concept that provides exclusive rights to creators, while Copyleft is a licensing method that encourages the unrestricted sharing, modification, and utilisation of creative works.



Copyleft symbol

# What is Open Source Software (OSS)?

## (using Open Source Initiative definition)

- To be classified as OSS, the software must be (according to its licence):
  - Freely redistributable
  - Source code must be available for free or at reasonable reproduction cost
  - Modifications and derived works must be allowed and be distributable under same terms
  - Can protect integrity of author's source code as long as allow source code patches
  - No discrimination against people/groups
  - No discrimination against fields of endeavour
  - Must not be restricted to use with a specific product
  - Must not place restrictions on other software distributed with it
  - Must be technology-neutral



# Difference between Free Software and Open Source Software

- According to Stallman, "Open source is a development methodology; free software is a social movement."
- Open Source covers a wider range of licence types
- More ability to mix Open Source software with proprietary software than is the case for free software
- The Open Source concept was developed to bring major software businesses and other high-tech industries into the mix.
- When avoiding distinguishing between these, people use the terms:
  - FOSS (Free and Open Source Software); or
  - FLOSS (Free/Libre and Open Source Software)

Source: <http://www.gnu.org/philosophy/open-source-misses-the-point.html>

# Free software and open source software: Examples



- **OSS and copyleft** (changes to the source must be made available to others)
  - The Linux kernel
  - MariaDB (database software based on MySQL codebase)
  - Eucalyptus (for building private clouds – company bought by HP)

- **OSS and not copyleft** (changes to the source do not need to be made available to others)
  - Apache web server
  - OpenCV (Computer Vision library originally by Intel)
  - Chromium (the core of Google Chrome web browser)

*Note: It's a bit more complicated than this as some of this software is available under multiple licences. More later on OSS licences.*

# Importance of FOSS in R&D and startups

- Most infrastructure used in R&D and startups uses FOSS:
  - Operating systems (e.g. Linux)
  - Containers (e.g. Docker)
  - System configuration management (e.g. Puppet, Chef)
- Most new software is built using FOSS:
  - Software platforms (e.g. Java, Scala, Python, Ruby on Rails, node.js)
  - Software libraries/frameworks (e.g. Spring framework, glibc)
  - Software build and test automation (e.g. Jenkins, Cucumber)
- Most new software contains FOSS:
  - To reduce the time and cost of development
  - To reduce testing and maintenance costs (assuming using stable FOSS)
  - To provide compatibility with other software
  - To focus on the core differentiator of your own software

## Some open source business models

- Sell support and services
  - Example: Canonical (with Ubuntu)
- Sell certified version (with support and services)
  - Example: Cloudera (with Hadoop)
- Sell “enterprise edition” (effectively proprietary software)
  - Example: MySQL “standard edition” (not “community edition”)
- Dual licensing (copyleft so need commercial license if modify source)
  - Example: Digia (with Qt)
- Other advantages to the company
  - Example: Google (with Android)

# Challenges in using FOSS in products and services

- Meeting obligations of software licenses (ensuring appropriate notices, etc.)
- Possibility of accidentally “contaminating code”
  - E.g. a programmer introduces some GPL (General Public Licence) code from the Internet into some proprietary product code and then the product is released
    - legally, the company should release the proprietary source code
- Ensuring adequate quality of the final product if it includes some open source software of unknown quality
- Avoiding security vulnerabilities in underlying code (that may already be known to hackers)

# Obligations when using open source software

- The obligations depend on the actual software licence used by the software
- Your obligations may include:
  - Nothing (i.e. no special obligations); or
  - If you redistribute the open source software in your software:
    - Mentioning that you have used it; or
    - Redistributing any changes you made to it; or
    - Not suing other companies in relation to patents you may hold related to the features of the open source software; etc



# Summary of Main open source licences

Permissive licences:  
Changes need not be made available

Restrictive (copyleft) licences:  
Changes must be made available

Public  
domain

MIT

BSD

Apache  
Software  
License

GPLv2

GPLv3

AGPL

SleepyCat



- More restrictions/conditions on users
- More assurances of software staying free

## Public domain

- Work in the public domain does not have intellectual property rights
  - (eg the right has expired or has been deliberately placed in the public domain)
- Examples: the English language, Shakespeare's works, Beethoven's music, many old photos for which copyright has expired
- Not commonly used for software because:
  - As software development is a recent activity, copyright hasn't expired yet
  - Author can't make disclaimer (unlike open source licences)

# Massachusetts Institute of Technology Licence (MIT License)

- User can do anything with the software...
- But they must make sure that the copyright of the original author is maintained
- No warranty

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Removed  
in simplified  
version

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# GNU General Public Licence (GPL)



- More restrictive than MIT and BSD – it is copyleft
- You can use the code and change it, but you must release all modified code under the same licence and any other code of yours that touches it
- 2 main versions - GPL v2 and GPL v3
- <http://www.gnu.org/licenses/gpl.html>
- Clause 5 of GPL v3:
  - You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:
    - a) The work must carry prominent notices stating that you modified it, and giving a relevant date.
    - b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to “keep intact all notices”.
    - c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.
    - d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.
  - A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an “aggregate” if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

# When creating open source software:

## How do you know what licence to use?

- Or use “Dual-licensing” – this is now very common
- Build up the market first and then provide services
- Eg:
  - Software can be licensed as GPL or proprietary licence
  - If a company doesn’t want to make their changes available, they can come to you to negotiate a proprietary licence



# When creating open source software: How do you know what licence to use?

Permissive licences:

Changes need not be made available

Restrictive (copyleft) licences:

Changes must be made available

Public  
domain

MIT

BSD

Apache  
Software  
License

GPLv2

GPLv3

AGPL

SleepyCat



If:

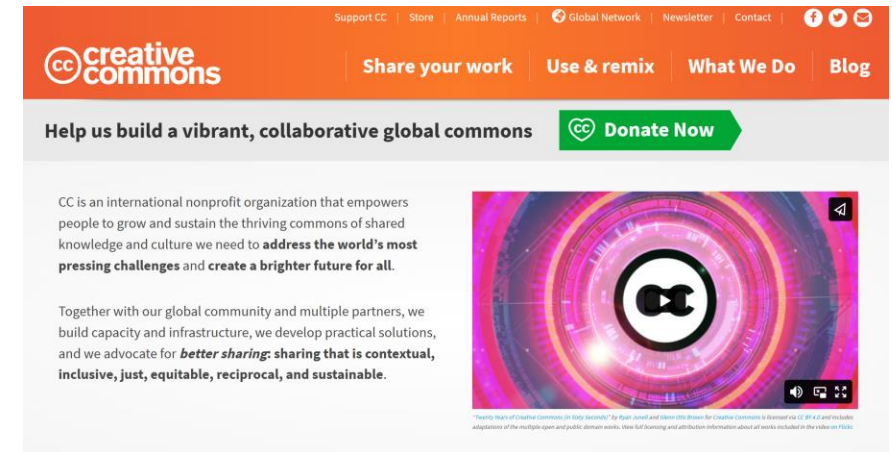
- You want a lot of companies to adopt your software in their products/services, and
  - You don't care if they make their changes available (eg as you just want the code to be used or you have deep enough knowledge & expertise that they will come back to you):
- => use a permissive licence (eg BSD, Apache)

If:







- You want to ensure that companies (using your software in their products) make their changes available (so you and others can get them):
- =>use a restrictive licence (eg GPLv3)

# Creative Commons

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- Creative Commons licenses give everyone from individual creators to large institutions a standardized way to grant the public permission to use their creative work under copyright law. From the reuser's perspective, the presence of a Creative Commons license on a copyrighted work answers the question, "What can I do with this work?"



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