

## COLLABORATIVE HOSTING PLATFORMS: A CASE STUDY OF FOSSHUB

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### Abstract

Free and Open Source Software (FOSS) approach in software development depends upon collaboration among the developers. The collaborative development approach allows evolutionary development of software as the requirements may change during the development depending upon developer's own change of interest as well as based on user feedback. The geographic distribution of the volunteer community makes the collaboration aspect difficult. The collaborative project hosting platforms provide a service to the users by providing a common place to be able to locate the software as per their need after due comparison with multiple software of similar type. This paper intends to provide an insight into the various parameters which contribute towards providing informative value regarding software available through collaborative platforms. Case study approach has been used to identify the types of projects available as freeware, the most popular category of software available through collaborative platforms along with the importance of user feedback.

**Keywords:** Free and Open Source, FOSS, Collaborative platform, freeware, FossHub

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## Introduction

Over the last decade and a half, some very successful Free and Open Source Software (FOSS) [1,2] have emerged which has caused the software developers and companies to seriously contemplate this form of collaborative development. FOSS approach in software development depends upon collaboration among the developers. It also takes into consideration the user feedback for betterment of the software. The collaborative development approach allows evolutionary development of software as the software requirements may change during the development process. The geographic distribution of the volunteer community makes the collaboration aspect difficult. As the collaborative development approach has gained acceptance as a viable model, many collaborative project hosting platforms have emerged like GitHub, Sourceforge, Launchpad, FossHub etc. (3-6). Such platforms enable community culture for individual projects as well as knowledge sharing among various projects. Apart from developers, the collaborative project hosting platforms provide a service to the users by providing a common place to be able to locate the software as per their need after due comparison with multiple software of similar type and use it as freeware. This paper intends to provide an insight into the various parameters which contribute towards providing informative value regarding software available through collaborative platforms.

## Methodology

The methodology uses case study approach for research problem under consideration. The study used *FossHub*, a web based platform for hosting and downloading of FOSS projects including certain projects which come under the definition of being freeware despite being closed proprietary software (6). The relevant data was extracted in September 2018. A total of 178 projects were hosted on the day of data extraction. The details for each project including title, type of software category it belongs to, number of downloads, type of operating system, last date of update and number of reviews on *FossHub* have been collected. Subsequently, all the collected data was compiled and computed using a spreadsheet package. Statistical tools such as percentage analysis are used for analysis and interpretations.

## Data Analysis

The data has been analyzed on following parameters:

- Category Count - To analyze the various categories of projects hosted on the platform
- Downloads - To analyze the prolific projects based on their download counts
- Number of Reviews – To analyze the user interest in providing feedback
- Operating System Platform - To analyze the distribution of projects among various operating systems
- Date of Last Update - To analyze the status of the hosted project

Analysis based on the above parameters is detailed as below:

### A. Category-wise Distribution of Hosted Projects

It is clearly observed from Table 1 that a total of 178 projects have been hosted on *FossHub*. The highest number of projects have been hosted under the category of Graphics Apps (14.04%), followed by Utilities Software (12.92%) and Anti Malware (8.43%). In 10 categories, the hosted projects range from 2.81-3.37% in number whereas remaining categories have less than 2.26% projects. A total of 8 categories have single projects hosted under them.

**Table 1: Category-wise Count of Projects and Total Downloads**

S.no.	Category	Number of Projects	Downloads	%Projects	%Downloads
1	Anti Malware	15	12097124	8.43	5.42
2	Audio Editors	5	62456699	2.81	27.981
3	Audio Players	5	237475	2.81	0.106
4	Backup Tools	3	35144	1.69	0.016
5	Browsers	3	27478	1.69	0.012
6	Burning Tools	2	3005360	1.12	1.346
7	Chat Clients	1	7279	0.56	0.003
8	Codec Packs	1	84019	0.56	0.038

9	Database	3	1001586	1.69	0.449
10	Developer Tools	6	4237744	3.37	1.899
11	Disk Analysers	3	8573087	1.69	3.841
12	Ebook Apps	1	6842807	0.56	3.066
13	Email Clients	1	4237	0.56	0.002
14	Encryption	5	21595	2.81	0.01
15	File Archivers	2	26119	1.12	0.012
16	File Extractors	1	28145	0.56	0.013
17	File Managers	5	801475	2.81	0.359
18	File Sharing	5	36498669	2.81	<b>16.352</b>
19	Financial Apps	1	8966	0.56	0.004
20	Firewalls	3	10205	1.69	0.005
21	FTP Clients	3	27184	1.69	0.012
22	Game Emulators	1	1656372	0.56	0.742
23	Graphic Apps	<b>25</b>	11494342	<b>14.04</b>	<b>5.15</b>
24	Media Players	5	7712708	2.81	3.455
25	Mobile	2	3443303	1.12	1.543
26	Mount Images	1	9406	0.56	0.004
27	Multimedia	6	17018501	3.37	<b>7.624</b>
28	Network Tools	2	20818	1.12	0.009
29	Office Apps	3	25867	1.69	0.012
30	Operating Systems	4	7977494	2.25	3.574
31	Organisers	6	331351	3.37	0.148
32	Password Managers	2	756763	1.12	0.339
33	Pdf Apps	3	39687	1.69	0.018
34	Pre Release	3	70923	1.69	0.032
35	Security	2	37269	1.12	0.017
36	System Cleaners	3	45443	1.69	0.02
37	System Rescue	2	34213	1.12	0.015
38	Text Editors	5	1872428	2.81	0.839
39	Utilities	<b>23</b>	26667226	<b>12.92</b>	<b>11.947</b>
40	Video Editors	6	7962213	3.37	3.567
	Total	178	223208724		

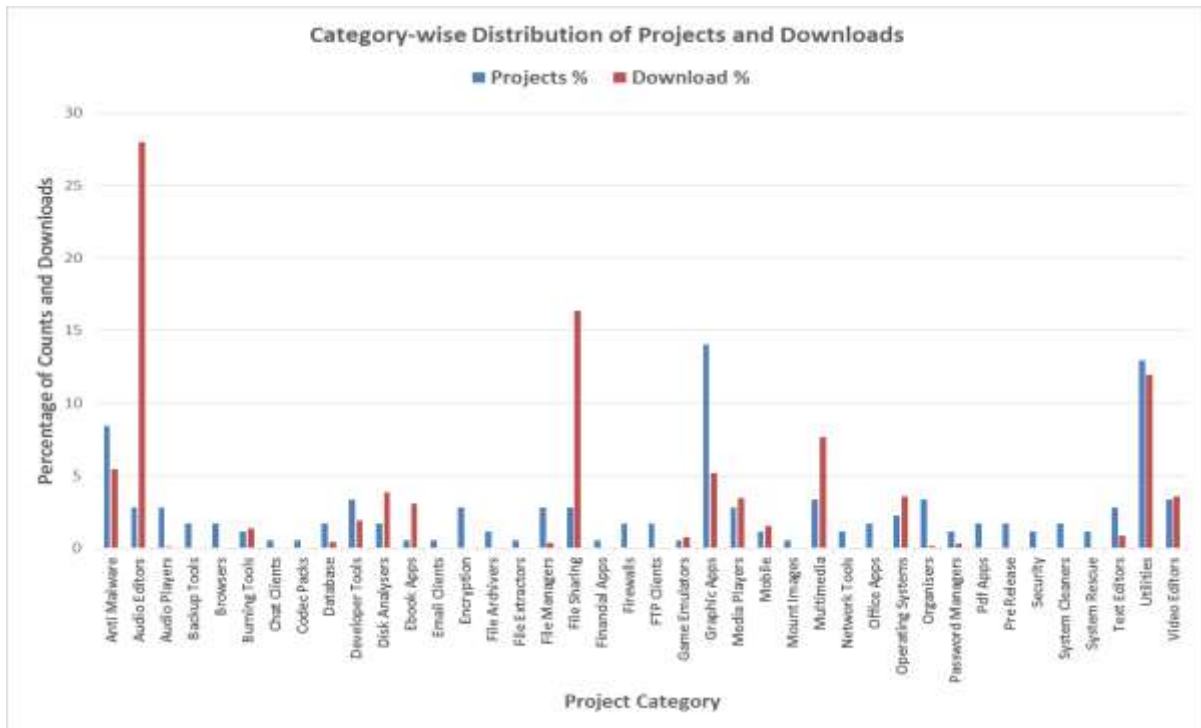


Fig. 1: Category-wise Distribution of Projects and Total Downloads

**B. Download Distribution Based on Type of Project Category**

Fig. 1 shows the distribution of projects based on software category and the corresponding percentage of downloads for each category. It is observed from Fig. 1 that *Audio Editors* are the most downloaded category of projects (27.98%) followed by *File Sharing* projects (16.35%) despite both the categories hosting less than 3% projects each. Projects hosted under *Utilities* category have 11.95% of total downloads.

**C. Project Popularity**

The project popularity can be determined from Number of Downloads. From Table 2, it is observed that Project *Audacity* under Category *Audio Editors* is the most popular project hosted on *FossHub* with highest number of downloads. A File Sharing Project *qBittorrent* is the second highest downloaded project followed by Utilities Project *Classic Shell*. Although Graphics Apps Category has the highest number of projects hosted under it, yet a project under it comes at the fifth position from top in terms of individual popularity. Similarly, Category Anti Malware has the third highest number of projects listed under it, yet a project under it comes at the tenth position in topmost downloaded projects.

**Table 2: Project-wise Number of Downloads (Top 25 Projects)**

S.No.	Project	Category	Downloads
1	Audacity	Audio Editors	61469176
2	qBittorrent	File Sharing	36364883
3	Classic Shell	Utilities	19841854
4	MKVToolNix	Multimedia	14879583
5	IrfanView	Graphic Apps	7376749
6	Avidemux	Video Editors	7152610
7	Calibre	Ebook Apps	6842807
8	WinDirStat	Disk Analysers	6401740
9	HWiNFO	Utilities	6271683
10	Spybot Search and Destroy	Anti Malware	5969993
11	SMPlayer	Media Players	5216882
12	Android-x86	Operating Systems	5138391
13	UsbFix	Anti Malware	4332054
14	MyPhoneExplorer	Mobile	3354336
15	Remix OS	Operating Systems	2751190
16	Light Alloy	Media Players	2430910
17	SpaceSniffer	Disk Analysers	2159823
18	InfraRecorder	Burning Tools	2151004
19	PSPad	Text Editors	1817142
20	Universal Media Server	Multimedia	1766922
21	ZSNES	Game Emulators	1656372
22	Code Blocks	Developer Tools	1519768
23	ConEmu	Developer Tools	1471889
24	RogueKiller	Anti Malware	1333236
25	KiTTY	Developer Tools	1218685

#### ***D. User Interest in Project Improvement***

The user's interest in any project's improvement can be ascertained from Number of Reviews provided for a particular project. From Table 3, it is observed that Project *FotoSketcher* under Category *Graphic Apps* is the project with highest number of reviews hosted on *FossHub* although it is not in the top 25 downloaded projects. It has been observed from Table 2 and Table 3 that 16 of the top downloaded projects also have garnered considerable user interest in terms of reviews.

**Table 3: Project-wise Number of Reviews (Top 25 Projects)**

S.No.	Project	Category	Number of Reviews
1	FotoSketcher	Graphic Apps	480
2	MyPhoneExplorer	Mobile	416
3	UsbFix	Anti Malware	314
4	Light Alloy	Media Players	311
5	MKVToolNix	Multimedia	229
6	Audacity	Audio Editors	227
7	Classic Shell	Utilities	196
8	Spybot Search and Destroy	Anti Malware	189
9	qBittorrent	File Sharing	176
10	WinDirStat	Disk Analysers	153
11	Junkware Removal Tool	Anti Malware	102
12	SpaceSniffer	Disk Analysers	99
13	PSPad	Text Editors	89
14	SMPlayer	Media Players	85
15	Synfig	Graphic Apps	63
16	Calibre	Ebook Apps	56
17	ConEmu	Developer Tools	52
18	VisiPics	Graphic Apps	52
19	ZSNES	Game Emulators	43
20	mp3DirectCut	Audio Editors	41
21	Diagram Designer	Graphic Apps	36
22	Password Safe	Password Managers	35
23	Caesium Image Compressor	Graphic Apps	30
24	IrfanView	Graphic Apps	29
25	TEncoder Video Converter	Multimedia	25

### ***E. Cross Platform Compatibility***

The data showed that the projects may run on multiple platforms i.e. they are compatible with more than one operating systems. All the hosted programs run on Windows operating system although the version of operating system may vary from project to project. In addition to Windows, some projects are able to run on Linux, Mac OSx, BSD/FreeBSD, Solaris etc. Of the 178 projects, 63 (35.39%) could run additionally on Linux, 60 projects (33.71%) supported Mac OS followed by 23 (12.92%) supporting BSD or FreeBSD. Table 4 shows the percentage distribution of projects in various cross-platform combinations.

**Table 4. Distribution of Projects across Platforms (Operating Systems)**

S.No.	Operating System	No. of Projects	% Distribution
1	Windows	178	100
2	Windows + Linux	63	35.39
3	Windows + Mac OS	60	33.71
4	Windows + BSD or FreeBSD	23	12.92
5	Windows + Solaris	6	3.37
6	Windows + Others	6	3.37
7	Windows + Linux + Mac OS	54	30.34
8	Windows + Linux + Mac OS + BSD	22	12.36
9	Windows + Linux + Mac OS + BSD+ Solaris	5	2.81
10	Windows + Linux + Mac OS + BSD + Solaris + Others	2	1.12
11	Windows + Linux + BSD	1	0.56
12	Windows + Linux + Solaris	1	0.56

The data shows that all the projects hosted on *FossHub* run on Windows which makes it possible for users of Windows operating system to download and use free software.

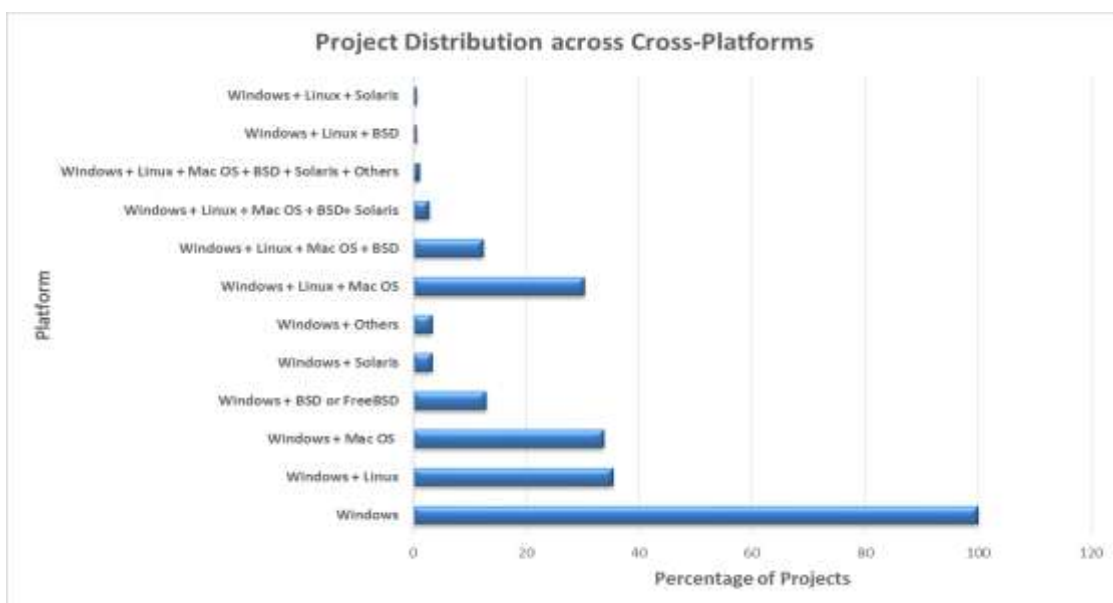


Fig. 2: Distribution of Projects across Cross-Platforms



### F. Project Status

The Fig. 3 shows that the number of projects with reference to their date of last update. The date of last update is a representative of the status of the project in terms of it being stable or active under progress or inactive. It has been observed that 87 projects hosted on *FossHub* are active as they have been last updated in the year 2018. The last date of update of 2 projects was not available.

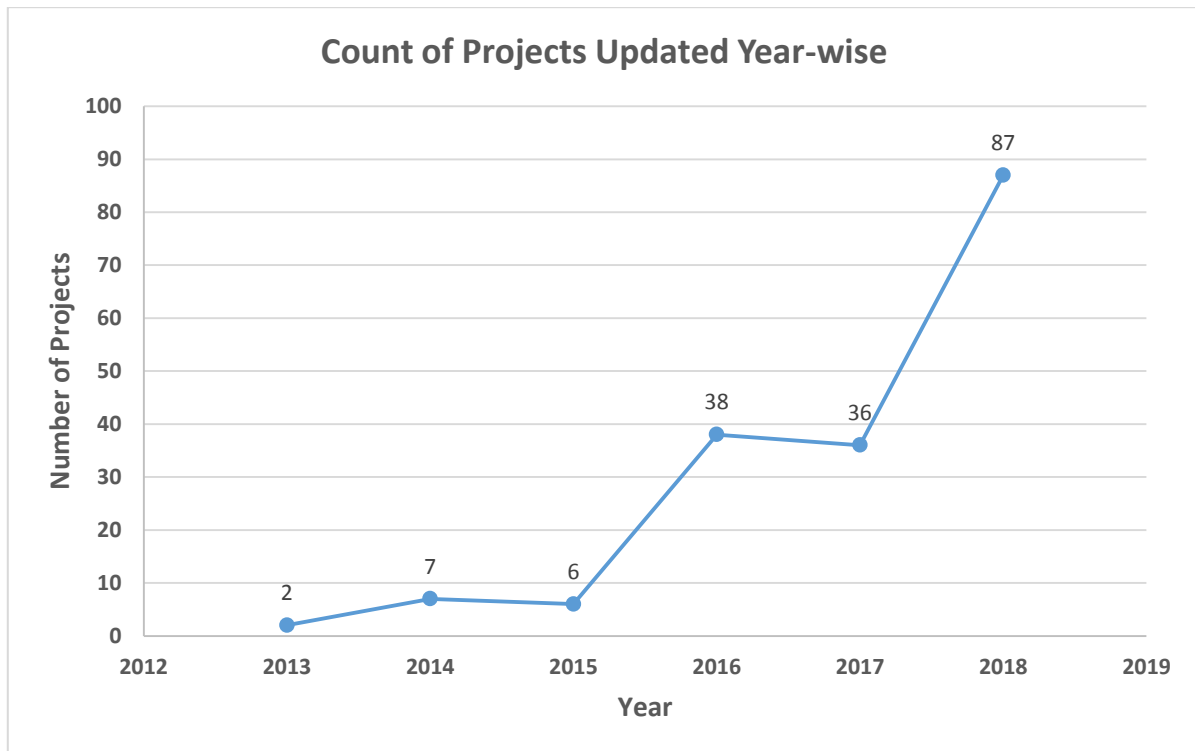


Fig. 3: Count of Projects updated Year-wise

### Findings

The study was conducted using the *FossHub*, a project hosting platform. The major findings of the study are:

- There are 178 projects hosted on *FossHub* till September 09, 2018.
- The highest number of projects have been hosted under the category of Graphics Apps (14.04%), followed by Utilities Software (12.92%) and Anti Malware (8.43%).
- The top most downloaded categories are Audio Editors, File Sharing and Utilities.
- The Project *Audacity* (Audio Editor), *qBittorrent* (File Sharing) and *Classic Shell* (Utilities) are the top three most downloaded projects.

- Most projects which are among the most downloaded projects also have been the ones which have been provided user reviews.
- All the projects hosted on *FossHub* run on Windows operating system. In addition to Windows, cross-compatible operating systems favored by projects on *FossHub* include Linux, Mac OS, BSD.
- 87 projects i.e. 48.88% projects are active in terms of software updations.

## **Conclusion**

With various project hosting platforms having come up over last decade, an in-depth information on types of projects being hosted and corresponding user interest in terms of use and improvement is required. The study conducted on *FossHub* has provided useful insight into various parameters of project hosting platforms.

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