

How to release software periodically

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Adult rating: not safe for work (NSFW)

1 ABSTRACT

We explain the perils and hiccups of existing software development both professionally and in amateur circles with regards to software releases. Software releases can be tamed and we propose a method which can be applied to most software. We demonstrate how different projects stored in GitHub⁸ compare and how they can improve. We dislike Bitbucket⁹ and therefore don't say much about them. We also talk in plural form despite us being a single being, hopefully not because we suffer from schizophrenia or delusions of grandeur; also we use semicolons whenever we feel like it and try to concatenate word after word to create long enough sentences that not even a professional Opera singer could say out loud in a single breath despite not saying much at all; maybe.

1.1 Keywords

9muses Nimrod alcohol babel bike dvcs github kpop nsfw pdf politics rant rst shedding software swearing wiki

2 INTRODUCTION

Releasing software once is simple; even an underage monkey trained in Ruby¹⁰ or Python¹¹ can access GitHub and upload anything, therefore giving the impression of being hipster, but the question is how to follow the initial release. In particular, there are many trained monkeys uploading software to repositories seemingly at random and then leaving them to wither without subsequent changes. Individual talks¹² with a non significant statistically group of developers suggested the main reasons for the halting of the development was a lack of defined guidelines for software releases, troubles handling distributed version control systems, missing leadership, insufficient contact information for potential contributors and feature creep among others. We leave other bus related¹³ arguments out of the equation as we are interested only in the situations where the will is there, but it is obstructed by something else.

2.1 Troubles handling distributed version control systems

Bitbucket sucks¹⁴, so we will ignore it and talk only about GitHub which is super cool. As many of the world's developers woke up from the prehistory of zip files and maybe CVS¹⁵ or Subversion¹⁶ directly into the bright and sparkling world of git¹⁷, the transition was less than ideal and we have found many of the cro-magnon developers kept using their methodologies (or rather lack of any formal methodology) for... ever. Despite git being a distributed version control system allowing individuals to create peer to peer micro networks, the social nature of humans forces them to stick all together like a pile of excrement to a single known server, because God forbid anybody have a different opinion. Hence GitHub⁸.

Branches are a much appreciated feature of git and other distributed version control systems, but developers mostly talk about branches in future tense without ever using them because, fuck it, why should they bother in the first place when you can put everything in *master*.

As such, the best practice of creating a branch per feature of the software is usually neglected and the *master* branch of git used as a recycle bin, with software stability hopefully drawing a sinusoidal function between official release versions (but no guarantees on that). There is no exit from this pit of despair, and we understand that developers who fall through it actually reach one of the Circles of Hell in life¹⁸.

A little education of the tools you use every day can go a long way. Even learning to read is hard, but you are reading this; can't you see how much you have already won? So go ahead and try reading some git documentation¹⁹, it can only help.

2.2 Poor or wrong contact information

Open source projects tout themselves as having the potential of attracting anybody and allowing them to contribute. But every software project is different and requires a different approach to contributions. Some projects require contributors to create issues or follow a coding style²⁰ while others require their users to write documents and publish them²¹, which both informs and serves as a roadmap.

Potential contributors find the lack of instructions or guidelines for contribution as a hurdle. There is always the fear that Murphy²² will make your contribution, no matter how useful, linger in a special developer limbo because you forgot to tag the issue correctly or didn't explicitly address one of the developers with commit

rights to the repository.

2.3 Missing leadership

There are many repositories²³ which at some point *stall* development because its authors don't accept pull requests and Google still points to their fork despite others being more advanced. Sometimes a note like "sorry, went out for coffee, will never be back" could give ideas to the contributors that the selected fork is a dead end, but people don't want to be nice to each other, and therefore we can't have nice things²⁴. In a few rare cases the community can pick up dead projects and fork²⁵ them successfully, but this requires a lot of mass to succeed, something which starts to be feasible when the number of active and maintained forks is greater than four²⁶.

A variant of this phenomena is the Ivory Tower Developer who once every two moons graces the mortal population with a visit, saying few words to some selected developers and leaving the rest wondering what have they done in this, or their previous life, to not be worthy. According to our measurements²⁷ most thin skinned contributors are effectively dissuaded from the project and never come back, since they happen to fall somewhere in the middle between full moons and see no activity.

Even active projects with several developers with commit rights are not safe if there is no strict guideline on who does what. As such, if a pull request or issue falls *between boundaries* of these developers, the time to address the pull request or issue grows exponentially with the number of overlapping developers (see Figure 1).

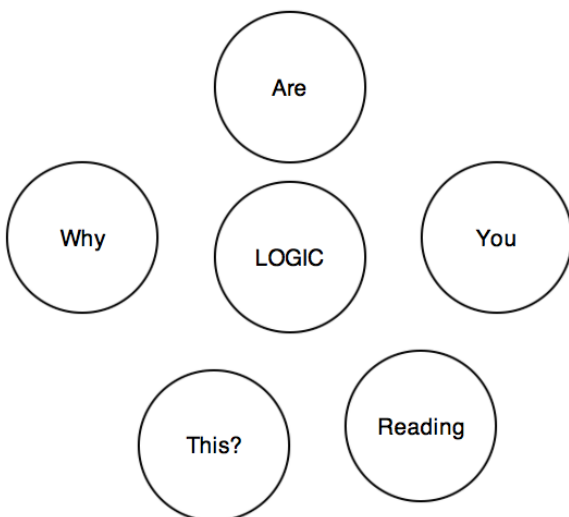


Figure 1. Venn diagram. We don't understand either.

2.4 Feature creep

Enough is enough. But people sometimes forget how much of enough is enough, and keep adding without consideration. Instead of finishing fixing minor bugs, new incomplete features are added to a project preventing it from ever reaching a *stable* state. Combined with the lack of branches of most projects even newcomers to a project will check out a repository and never get it working, most of them leaving at that point to watch pictures of cats that look like Hitler²⁸ being posted on the internet.

Feature creep is usually attributed to lack of focus. Lack of an updated task list (aka vague TODO last updated two years ago), hundreds of issues piling up, or mentions of heavy use of alcohol in forums or IRC channels are indicators of this. You are a moth and get distracted by shiny new things; we understand.

3 GIT-FLOW, SAVIOUR OF THE WORLD

Git-flow²⁹ is a software solution which can help with some of the enumerated problems. It is essentially gratuitous bureaucracy applied to software development. At the mere mention of bureaucracy most developers flee leaving a trail of screams and pulled out hair. However, git-flow automates that bureaucracy to the bare minimum, enforcing a practical guideline³⁰ to develop. Nothing from the points described below actually require git-flow; it is just a bunch of scripts to deal with the bureaucracy.

Git-flow has a good base documentation and plenty of fans have extended it³¹. This paper only highlights *why* it works, and how it solves the problems software developers have.

3.1 Master is not the master any more?

The first big change of how git-flow works is that by default it considers the *master* branch to be stable. And rightly so: a newcomer to a project may want to clone the repository and compile it. Since the default branch is *master*, it is best if it is stable and compiles without issues. Hence, a secondary branch named *develop* is created, where the actual commit and merge orgy happens.

When the developers consider that the contents of *develop* should be made public, they can merge that branch with *master*. Git-flow will also tag the source tree at that point with a version number and a message. Tags are automatically understood by hosts like GitHub as software release points³², and it is very easy to create software releases from them.

Through this simple change an easy pattern is established: any branch merged with master means a *public* change is done. During normal development these public changes will mean normal bug free development.

3.2 Hotfixes

Things go south. You know this if you are a developer. And to fix them, *hotfixes*³³ are issued. Sometimes a bug might be too embarrassing to leave out there, or it involves the pride of your employer's son. Whatever the reason, your normal development cycle is not fast enough and you have to stop whatever you were happily doing in *develop* and fix *master* instead.

For these situations you start with git-flow a *hotfix* branch based on *master*. In this branch you commit everything needed to make the software work again and save countless puppies. Once the hotfix is finished, git-flow will merge it against *master*, but it will also merge it against *develop*. This is very handy in the case where the fix involves new code; the scripts make sure it is applied in both places.

In the case of the hotfix involving applying code already found in the *develop* branch because the political nature of the bug escalated (eg. known crash which somebody figures how to obtain Scarlett Johansson private pictures³⁴) you can simply cherry pick changes from the *develop* branch. Those will be merged into *master*, and the automatic merge into *develop* again will make sure that when your normal development cycle reaches the release state git won't complain about duplicate stuff.

3.3 Sub develop branches

The same process created around the master and develop branches can be reused recursively for the purpose of clearly limiting feature creep for each release. Moving development to a *develop* branch doesn't magically avoid feature creep. If the next software release has to have features A, B, C and you can't wait to implement D, simply create another branch, maybe *develop-future* where you add these changes. This split avoids that A, B, and C are eventually solved, but the *develop* branch can't be merged into *master* because it contains an incomplete D, or worse, is left unstable. If you can't be arsed to finish the tasks required for the stable release, at least don't get in the way of others implementing then.

This goes well also with periodical public releases. The old Vulcan³⁵ saying "*Release early, release often*" is usually ignored in its second part, because most people try to avoid planning. Every three months in your development, decide what features are enough to make

a stable release and keep *develop* only for them. Wow, we just rediscovered Debian's stable, testing and unstable distributions³⁶ but using branches. Aren't we clever? This has been demonstrated to work for ages. Any of your arguments against this subdivision is invalid unless you prove that your software is more complex than an operative system with thousands of interdependent packages who has lived for longer than two decades³⁷.

4 NON TECHNOLOGICAL SOLUTIONS

Git-flow is a technical aid to the bureaucracy problem. Some of the problems we have mentioned don't have a clear software solution. We ask the community for feedback on how to deal with them and propose our own.

4.1 Necessary documentation

The disadvantage of using git-flow (or just about anything else other than piling commits recklessly on *master*) is that it requires documentation. The number of bureaucratic developers is still outweighed by the hordes of senseless commit-happy hackers. As such, these hackers will clash with the process unless it is clearly documented.

The bare minimum is mentioning that you use a specific kind of process for software development. Mentioning git-flow and linking to it may be enough, but try to clearly mention that contributions are to be made from a specific branch (*develop*); it can be frustrating for a contributor to have his work rejected because he based it on the wrong branch.

4.2 Clear task domain division

The solution to the missing leadership in the case of multiple developers with commit rights can be solved through a simple wiki page modified by all of them. Initially this wiki page can start with the repository owner, and from then on each new member can be listed there. The project needs to subdivide itself in manageable tasks, for instance: documentation, online support (forums, IRC, twitter, issues, etc. further subdivided if necessary), web design and updates, software quality (also known as continuous integration), core development, additional tools, etc.

These subdivisions can start small: if a project features just three people it may be unnecessary to subdivide the domain in more than three chunks if each people's task overlap. Then as people are added, the list can be refined.

As people enter a team, they should be placed on a task with an explicit *supervisor*. This would be a person who

verifies the work of the supervised. Initially the changes done by the new members should all be approved by the supervisor. Once the supervisor considers enough training has been done, the supervisor is still assigned but allows the new member to work directly. The assignment serves for the purpose of resolving strange conflicts, and the new member still knows whom to ask for help if needed.

Communication is an important factor to help this succeed. When a new member is in the early learning stage, he should always *ping* the supervisor when the task is meant to be reviewed. As such, if a GitHub issue is seen by the new member and marked as ready, the supervisor can directly apply the changes. Also, a *dispatcher* can be assigned to decide who does what, which is usually best left to the original developer or whoever has the most know-how of the project.

4.3 Locked feature lists

Nobody knows better when a release needs to be made than the project's developers. However, there is always the temptation to add *just a little bit more* to the next release, and so, never finish.

In a similar fashion to the clear task domain division, another wiki page can hold the list of tasks that need to be done for a specific release. But rather than being modifiable by anybody, this page should be touched only by the person in charge of the project. Changes to the list should be discussed as a group and weighted over: how does this new task impact the release schedule? Is the new schedule delayed by how much? Should we delay some tasks from the feature list to compensate?

Note again that this doesn't *prevent* developers from working on future developments since they can use many other branches other than *master* or *develop* (branches are free). The main goal here is making sure everybody knows **when** the software is going to be released, and **what** has to be done to do so. When both of these are known, even random occasional contributors can step in and help with the release. But when the next release is *whenever it is ready* or long overdue, how are contributors meant to help with that?

4.3.1 Traceability

Every time you look at the `CHANGES` file of a project and it says "*And many bugfixes*", the author(s) of that package are sending to you a big **FUCK YOU** with big bold colorful letters and a smirk on their faces. Why should you know if a potential security issue was fixed? Everybody has different levels for what *important* means, and hiding a group of changes under the *many bugfixes* label prevents your users to clearly address the advantages and disadvantages of investing their own time to migrate to the new release.

Related to locked feature lists, if you are already doing the work of accounting which tasks go where for releases, you might as well remove them from the `TODO` list and put them in the `CHANGES` file. Basically, every branch merged with *develop* should modify those *meta* files too. And nowadays it is very common to use the syntax `Refs #xx or Fixes #xx`³⁸ in commits. Which increases the traceability, because you can now hyper link changes done to your project, and if your users are curious, they can find out³⁹ what exactly changed in the source code. Of course, if the project is big, post a pterodactyl view of the changes on your website and make the text *And many bugfixes* a hyper link to the detailed log with further hyper links.

Just like version numbers, hyper links are cheap, you know...

4.4 Limit the lifetime of public issues

Having unresolved issues for longer than a year sends a foul smell to users, and services like GitHub provide search options⁴⁰ to detect them. Some issues may have good reason to be kept open, as maybe they are future feature requests. First, the developers should address if the feature is accepted or not. If it is accepted, the project's *TODO* or *roadmap* list can be updated to describe the feature, and the issue can be closed indicating that it has been moved to the *TODO* or *roadmap* of the project.

If the old issue happens to be a bug which can't be fixed, the list of *known bugs* for the project can be updated to include a description of the problem. The issue can also be scheduled for a future version in the *TODO* or *roadmap* files. With little documentation the project officially acknowledges the bug, and gives back feedback as to when it may be fixed. Much better than leaving the issue open to gather dust.

5 LIMITATIONS

The usage of git-flow may not be perfect⁴¹ for a specific project. And that's perfectly fine. The conventions used by git-flow improve immediately the quality of many projects; where they don't fit, you simply change the rules. A fork of git-flow could be used, or manually just about any other policy.

6 CONCLUSION

1. Use git-flow²⁹. It may feel like a corset in the beginning, slightly constraining, but corsets can be good too⁴².
2. Don't watch too many YouTube videos⁴³.
3. Program in Nimrod⁴⁴ FTW.

6.1 ACKNOWLEDGEMENTS

Thanks to Andreas Rumpf for making Nimrod⁴⁴.

Thanks to 9muses for endless inspiration⁴⁵.

Thanks to BitPuffin for creating a Nimrod User Group for Varriount.

Thanks to GitHub for hosting this paper and allowing deranged subjects to express their ideas formally.

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