

The Documentation Process

Tutorial Documentation

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1. Overview

In large projects, it is vital that all participants communicate their ideas, suggestions, and accomplishments. Good communication will ensure a common understanding of the goals and the status of a project, leading to increased synergy and creativity, with the end result being efficient execution of coherent plans. Communication techniques include meetings, discussions, brain storms, work sessions, and written documentation.

Written docs have several advantages over other forms of documentation:

- Overcome ambiguities in spoken language.
- No need to accommodate others' schedules in distributing and reading docs.
- Communicate ideas even after critical participants leave the project.
- Compel critical thinking in composing docs.

As already mentioned, good documentation serve several functions:

- Communicate ideas.
- Align goals and interests.
- Update status.
- Create consensus.
- Highlight accomplishments.

This doc is written in response to the increased documentation effort within the GamesCrafters group.

2. Goals and Non-Goals of this Document

This documentation targets anyone who looks to write docs. It tries to outline tips and approaches that the author and colleagues have found to be effective in putting together docs. The suggestions here are by no means applicable only to documentation within GamesCrafters. The author would greatly appreciate feedback and differing opinions on the material presented.

Readers should walk away with the following:

- High level appreciation of the documentation process.
- Understanding of what the documentation process seeks to accomplish.
- Confidence to compose their own written documentations.

All other issues not listed as goals would be considered non-goals.

In particular, this documentation will not try to do the following:

- Give specific guidelines on documentation format, content, and style.
- Outline definitive approaches to docs.
- Advocate a particular technology to use in composing docs.

Our firm belief is that there are as many successful documentation formats, styles, approaches, and principles as there are successful engineers. Therefore we try to focus on *what* a good doc tries to accomplish, and leave the readers to use their creativity in deciding *how* to make a successful doc.

3. Before Writing a Document

A wise person once said “Think before you speak.” Replace speaking with writing a document, the saying would still apply. “Thinking”, in the sense of written docs, may involve going through several tasks before one even begins to write. All the items below seek to define and narrow down the problem space that the doc is trying to tackle.

3.1. Team discussion – do we need a doc?

Before a doc is written, people need to decide whether a doc is actually needed. This is the classic “go or no go” question. It may be asked as a part of a regular team meeting or through informal consultations with particular team members. If there is any agitation at all for a written documentation, then someone on the project should take the initiative to toss out this question and seek consensus among team members.

3.2. Brainstorm on the project

An ill-defined project would not have a good doc, and a good doc would lead to a well defined project. One may argue that writing a doc is in some sense “brainstorming” on a project. However, for nascent projects, it may be necessary to narrow down the goals and the problem space of the project before thinking about docs.

3.3. Brainstorm on the doc

Before a doc is written, people need to agree on what a doc is trying to accomplish and what the scope of the doc should be. In addition, doc writers may need to solicit from targeted readers any particular items or questions that the readers wish to see addressed. Furthermore, people need to agree on who should write and maintain the doc, and what the review/update process should be. This is usually accomplished through brainstorm sessions in regular team meetings. The focus here is consensus among teammates, thus it is more effective to bring everyone together into a group discussion, and individual consultations may work less well.

4. Document Layout and Organization

A good doc should strive to convey maximum information with minimum effort from doc writer and doc reader. This is usually achieved through clarity, simplicity, and specificity in writing. In addition, detailed below are several techniques that may help communicate critical information effectively and efficiently. The readers are encouraged to browse this section not as rules set in stone, but as tips in documentation layout and organization that may be adapted to fit the particular needs of a project.

4.1. Scannable headings

Having scannable headings are essential because:

- Readers and writers both have limited attention spans.
- Readers and writers both have (usually) unlimited desire to play more and work less.
- Informative headings allow readers to quickly extract information.
- Headings break up large chunks of intimidating text.
- Headings create hierarchy in the doc.
- Headings force the doc writer to organize ideas.
- Headings help the doc writer in wording the doc.

Headings are usually short, bolded, and stand out from other text.

4.2. Common doc formats

We have encouraged creativity in composing docs. However, adhering to some elements of common doc formats may create a sense of familiarity for the readers, allowing the readers to approach the doc with minimum entry efforts. Adhering to common doc formats would also help the doc writers by allowing writers to quickly package information using tested organization and format.

Most docs include the following sections in one form or another.

- Title Page + Table of Contents
- Authors list + Version History/Update History
- Introduction/Overview.
- Goals & Non-Goals/Scope/Targeted Audience.
- Executive Summary/Abstract (not used in this doc).

Other sections often vary greatly between documents and document conventions. We emphasize again that the reader should adopt a format that is effective for the project involved.

4.3. Logical organization

Needless to say, good logical organization is a key characteristic of effective docs. Common approaches to organize and present information include

- Chronological order
- Priority order

- Hierarchical order
- Breakdown by concepts
- Breakdown by tasks
- Breakdown by personnel involved

Again, the reader should fit these common approaches to the particular project involved.

4.4. Lists, tables, and figures

Often, information is most effectively presented in styles other than discursive text. Lists, tables, and figures are often essential because

- They distill and condense critical information.
- Thus they allow readers to quickly extract information.
- They help doc writers in organizing information.
- They can replace chunky text, leading to less tedium for writers and readers.
- Some information is presentable only in lists, tables, and figures.
- Figures may be especially instructive in conveying complex concepts.

We encourage the reader to strive to make true the saying “a picture is worth a thousand words.” If a concept can indeed be effectively conveyed with clarity and simplicity in a diagram, then using a thousand words instead is a poor joke on the creativity of engineers who write and read docs.

4.5. Visual aesthetics

An effective doc should look presentable and pleasing to the eye. Otherwise, a Frankenstein-look-alike doc may discourage readers even if the information contained is well thought out. Pleasing visual aesthetics may be achieved by

- Consistency in headings format
- Consistency in text format
- Consistency in section numbering
- Consistency in numbering of lists/tables/figures
- Consistency in indentation
- Consistency in language used to describe similar concepts
- Consistency in lengths of uninterrupted text

This document has tried to provide an example of such visual consistency, even if it involves repeating the words “Consistency in” several times.

4.6. Having necessary redundant information

This contradicts the coding style that dictates redundant code is often bad. In writing docs, often it is effective to have some redundancy and reproduction of information, because in scanning a document, the reader is likely to hone-in to a section or heading that is most pertinent to his or her task, and ignore the other unrelated parts of the document. Consequently, doc writers should consider reproducing the same information in several

sections in order to make each section truly modular and stand alone. It is arguably better to have readers grapple with a slightly longer doc than to have readers miss out on critical information.

5. Document Reviews

Document reviews is another key part of the documentation process. Its key function is to let everyone examine and interrogate the same document. Often, new ideas and new disagreements will arise on previously developed ideas and previously established consensus. This is both the limitation of unintentionally ambiguous spoken language (often used to gain consensus in team meetings), and the result of additional time for everyone to think about the project since consensus was previously built. Incorporating new ideas and removing lingering ambiguities may go a long way towards building a good project and a harmonious team.

Doc reviews are usually driven by doc writers. To facilitate productive doc reviews, doc writers may consider doing the following:

5.1. Before the doc review

- Announce the review with some advance notice.
- Invite key participants to bring in questions.
- Prepare list of issues and questions that the doc writer would like to see addressed.
- Prepare any necessary slide shows, demos, or black board diagrams.

5.2. During the doc review

- Be conscious of time allocated for the review and take topics “offline” if needed.
- Periodically encourage questions and check for audience understanding.
- Package and summarize information for the audience, instead of forcing the audience to read the doc in detail.
- Despite the above, drill down on ambiguous wording if needed.
- Occasionally highlight the relevance to others work, to give everyone a sense of having a stake in the success of the document.

5.3. After the doc review

- Follow up on “offline” topics if needed.
- Check with key participants for additional comments if possible.
- Revise and restart the document process cycle, if needed.
- Solicit feedback on document style/approach and doc review performance.

Like an effective doc, productive doc reviews should be well prepared, clear, short, and simple to understand.

6. Living Documentations

The documentation process does not end with the doc review. For ongoing projects, the accompanying documentation need to be living documents, evolving as the project and the needs of the team change. As a side note, the pinnacle example of a “living document” may be the U.S. Constitution, continuously amended for over two hundred years as the American national project develops. While many engineering endeavors carry much less complexity than the American national endeavor, the spirit of having living documents remain valid.

Several things may facilitate living documents:

- Clear identification of who wrote and who maintains a particular doc.
- Clear feedback channel from doc readers and users to those who maintain docs.
- Initiative from doc maintenance to update doc and restart doc cycle if needed.
- Provide all necessary docs in accessible and organized manner.

The above is by no means an exhaustive list.

Living documentations would draw from the creativity of generations of engineers who pass through the project, allowing the project to accumulate strength from more and more engineering experience. Every effort should be made to ensure that no doc ever gets lost, and that no one needs to “reinvent the wheel” or rewrite docs because the living documentations withered from neglect.