

A Minimalist Approach to Framework Documentation

Ademar Aguiar

Faculdade de Engenharia da Universidade do Porto

Rua dos Bragas, 4050-123 Porto, Portugal

+351-22-2041600

ademar.aguiar@fe.up.pt

ABSTRACT

Good documentation is crucial for the success of frameworks. In this research, a new documenting approach is proposed combining existing document styles in a kind of "minimalist" framework manual with a special emphasis on framework understandability and usability, rather than on describing framework design. Benefits and drawbacks are evaluated from frameworks of different domains and complexity.

Keywords

Software documentation, object-oriented application frameworks, "minimalist" manuals

1. PROBLEM

This research addresses the problem of producing understandable framework documentation in an economical way as a means of increasing framework reuse effectiveness.

1.1 The Importance of Framework Documentation

Frameworks are widely known as a powerful technique for reuse [7]. Without appropriate documentation, frameworks are, however, particularly hard to understand by first-time users, requiring large learning curves and negating major reuse advantages.

Good documentation can substantially help on the understanding of a new framework, by guiding users on the customization process, and making explicit their design principles and details.

Framework documentation usually provides multiple views and encompasses distinct styles of documents, such as: framework overviews, application examples, cookbooks, recipes, patterns and contracts. To fulfill all the audiences and requirements of a framework, a lot of documentation must be produced and maintained consistently in an elegant and economic way [1].

1.2 Documenting Purpose and Use

Much of the work on framework documentation has focused on documenting the design and architecture of frameworks [1], and less effort has been dedicated on exploring effective ways of describing the purpose and intended use of a framework.

1.3 "Minimalist" Documentation

The idea of "minimalist" documentation is based on the theory of minimalist instruction [2]. In this approach, the reader is offered with the minimal amount of information needed to get the task done. Among other characteristics, a "minimalist" manual motivate people to train on real tasks and get-started fast, present topics very briefly in the order that seems best for the reader, support error recognition and recovery, and tries to explore readers' prior knowledge. Among the experiments reported using these ideas to document frameworks are [3] and [6].

1.4 Research Questions

This research focus on the following questions:

- How can framework documentation be organized and presented in order to improve the understandability and usability of frameworks, especially by first-time users?
- How economical can be a "minimalist" framework manual, both to build and to understand?

2. GOAL

Although several approaches to framework documentation have proven to be effective, the best mix of document types, writing techniques and presentation styles, depends strongly on the specific objectives, context and economics of the project at hands.

The first goal of this research is the definition of a methodology, encompassing a generic model and process for producing framework documentation – in the form of a "minimalist" manual, and the definition of a set of tools to help automate parts of the documentation process. Th results will enable the development of "minimalist" manuals for a small set of frameworks specially selected for this work, and the evaluation of how economical is to build such manuals.

The other equally important goal is to evaluate the impact that "minimalist" framework manuals have on the understandability and usability of frameworks.

From the point of view of "minimalist" manuals [2], the ideas of "minimalism" will be leveraged to large and complex software systems, and its adequacy will be evaluated for these new situations.

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From the perspective of framework documentation, the main result will be the identification and structuring of all blocks of information and transformations needed to properly document a framework, with a special emphasis on its purpose and use.

3. APPROACH

The research will be structured in four major parts:

- the development of a documenting methodology;
- the application of the methodology on existing frameworks;
- the application of the methodology on frameworks under development;
- the evaluation of the resulting framework documentation.

Each of these parts is briefly explained and related in the next subsections.

3.1 Methodology Development

The first part of this research consists on developing a lightweight methodology for producing framework documentation in the form of a "minimalist" manual. This methodology should be flexible enough so that it can be adapted to the specificity of existing framework development processes.

3.1.1 Model Definition

The model will enumerate, describe and relate all blocks of information considered important for documenting a framework in a "minimalist" way. When instantiating the model to a particular framework development project it should be possible to decide to use all or only a part of the blocks identified.

3.1.2 Process Definition

The process will define the roles, techniques, and activities needed to produce the intended documentation. This documenting process should be intertwined with the framework development process in order to gather, transform and manage the blocks of information described in the model. The documenting process will be based mostly on the ideas of literate programming [4] [5].

3.1.3 Tools Identification and Development

Ideally, the process should be as automated as possible, but definitely there are blocks of information that cannot be automatically produced and, thus, dedicated writers or developers must write them. In this part of the research, tools will be identified to help automate the documenting process, and developed whenever possible.

3.2 Documentation of Existing Frameworks

To evaluate and fine-tune the methodology, two small existing object-oriented frameworks will be documented: *FormManager*, for the construction of user interface forms; *RecordManager*, for the retrieving and management of records from relational database tables, in an object-oriented application.

3.3 Documentation of Frameworks Under Development

After having successfully applied the methodology and tools for the two small frameworks, the approach will be then applied to one framework under development, to evaluate the adequacy of the approach in a typical development environment.

3.4 Evaluation

To evaluate if the "minimalist" framework manuals produced are better than traditional documentation, an empirical study will be conducted on two groups of academic students that will serve as first-users of the framework.

4. SUMMARY

Frameworks are a powerful technique for reuse whose success depends strongly on the quality of the accompanying documentation. Framework documentation helps users to understand their purpose, to learn how to customize it and to know its design details.

A lot of work already exists on ways of documenting the design and architecture of frameworks. In this research, it is proposed an approach to produce, in an effective way, framework documentation with a strong emphasis on describing its purpose and intended use.

Following the theory of "minimalist" manuals, the goals of the research are, first, the definition of a methodology (model, process and tools) to economically produce "minimalist" framework manuals; and, second, the evaluation of the methodology on frameworks of different domains and complexity.

5. REFERENCES

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