

A Systematic Approach to Creating and Maintaining Software Documentation

Allison L. Powell, James C. French, John C. Knight

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PROBLEM AREA



STATE OF THE ART



RESEARCH GOALS

WHY SOFTWARE DOCUMENTATION AS AN APPLICATION AREA?

- Problems with the current paradigm.
 - Difficult to write and hard to use.
 - Inconsistent between project revisions.
 - No assurance that effort will pay off for end users.
 - Not designed to provide high quality responses to queries.

RESOURCE-INTENSIVE, BUT RESULTS ARE OFTEN INADEQUATE OR INAPPROPRIATE

- Document publishing systems:
 - e.g. FrameMaker, Interleaf
 - Make it easier to deal with large sets of documents but aren't geared specifically to software documentation.
- Standards
 - Exist, but are often ambiguous and not universally adopted.
- Experimental Systems:
 - HyperCASE (Cybulski & Reed), Document Integration Facility (Garg & Scacchi), Software Documentation Support Environment (Horowitz & Williamson)
 - Both DIF and SODOS integrated database management systems with the software documentation associated with the software lifecycle and allowed queries on pre-defined keywords.

- Consider Documentation as Information
- Apply Information Retrieval Techniques

- How to organize on-line software documents.
- How to present software documents when browsing.
- How to search software documents.
 - How to present results of searches.
 - fragment size/what to return.
 - search accuracy.
 - How to approach the problem when searching source code.
 - How effective/useful is keyword searching on source code?
 - What's a more effective way?



OUR APPROACH



DESIRED FEATURES



EXPERIMENTAL SYSTEM

- Attack the problem in two ways:
 - focus on retrieval:
 - making the documentation readily available.
 - focus on authoring:
 - authoring and organizing documentation with retrieval in mind.
- Consider multiple views. For example:
 - newcomer needing concepts.
 - software engineer needing detail.
 - manager needing overviews.

- Provide Authoring and Viewing environment.
- Provide both on line and hardcopy versions of documents.
- Effective access to information contained in documents.
 - Organize to enhance IR performance.
 - Full-text searching.
 - Facility to navigate the document collection.
 - Typed hypertext links.

- Documents authored and viewed using FrameMaker.
 - Hypertext capabilities.
 - Navigational features.
 - Flexible.
 - Permits screen and hardcopy versions.
- Interface to WAIS search engine.
- Cross-reference and Hypertext filters.
- Directory-structured index to system and library source code.



EXPERIMENTAL SYSTEM

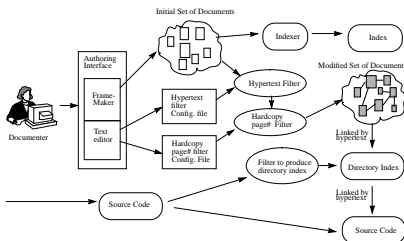


EXPERIMENTAL SYSTEM

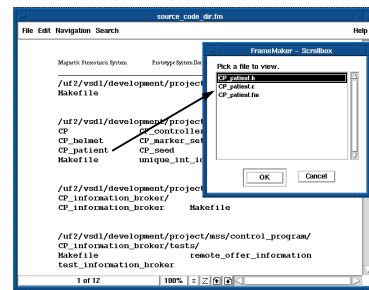
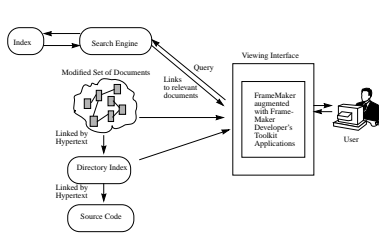


SOURCE CODE INTERFACE

DOCUMENTER'S VIEW OF THE SYSTEM



USER'S VIEW OF THE SYSTEM



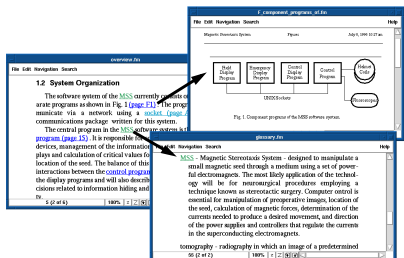
BROWSING INTERFACE



STATUS



FUTURE PLANS



- Prototype system
 - Authoring and viewing environments.
 - Tools
- Magnetic Stereotaxis System document collection
 - 100+ pages of system documents.
 - Glossary
 - Approx. 25 figures and tables.
 - Hypertext links for over 40 words and phrases.

- Expand MSS document collection.
- Gather feedback from software engineers working on the MSS project.
- Begin a document collection for the University of Virginia research reactor project.
- Explore ways to navigate document hierarchy.
- Explore ways to more fully integrate source code.
- Investigate most useful fragment size when responding to query.