

README

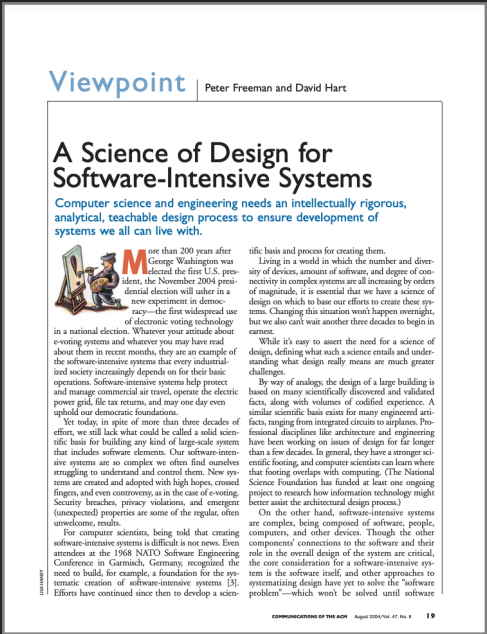
vs. IEEE, RUP, SWEBOK, CMMI

YEGOR BUGAYENKO

Lecture #1 out of 16

90 minutes

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“Design encompasses all the activities involved in conceptualizing, framing, implementing, commissioning, and ultimately modifying complex systems—not just the activity following requirements specification and before programming, as it might be translated from a stylized software engineering process.”

— Peter Freeman and David Hart, *Communications of the ACM*, vol. 47, no. 8, 2004

Software vs. Interiors

SDD at IEEE 1016

SAD at RUP

TS at CMMI

SWEBOK

README

Books, Venues, Call-to-Action

Chapter #1:

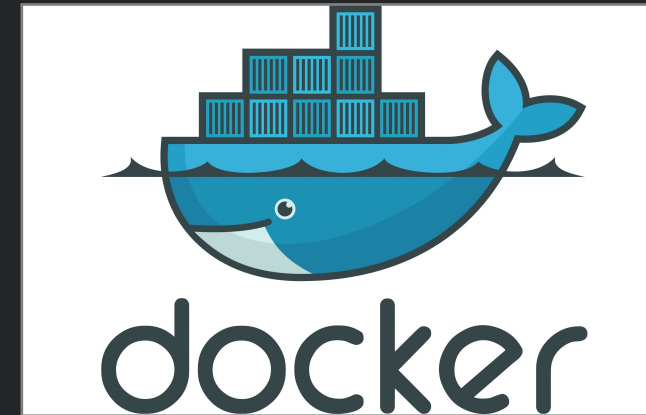
Software vs. Interiors



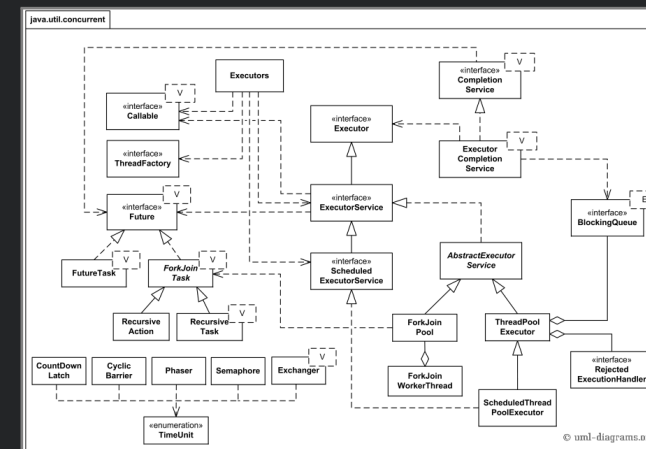
Interior



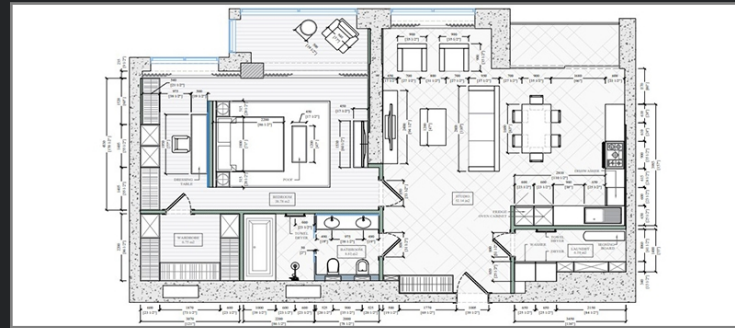
Interior Design



Software




Software Design



How to explain it?
Standards



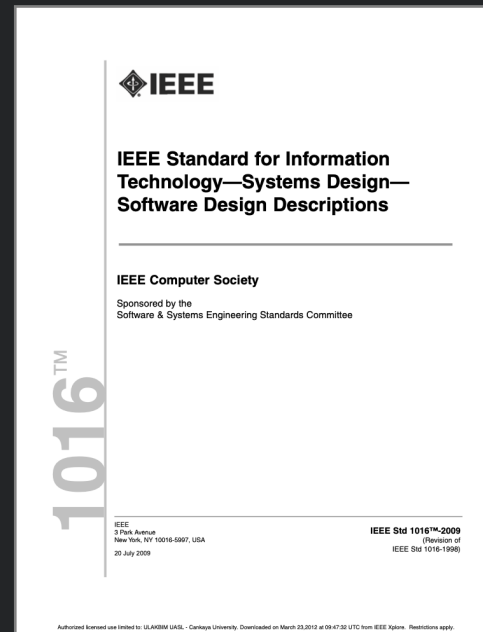
How to design?
Patterns



A good documentation
is a precursor to a good design.

Chapter #2:

SDD at IEEE 1016



“An SDD is a representation of a software design to be used for recording design information and communicating that design information to key design stakeholders. This standard is intended for use in design situations in which an explicit SDD is to be prepared.”

— IEEE 1016-2009

IEEE Standard for Information Technology—Systems Design—Software Design Descriptions

Inactive-Reserved on March 2020


Glossary

A request is data package sent from a client to a server.

A client is a computer with a web browser.

A server is a computer with a software installed.

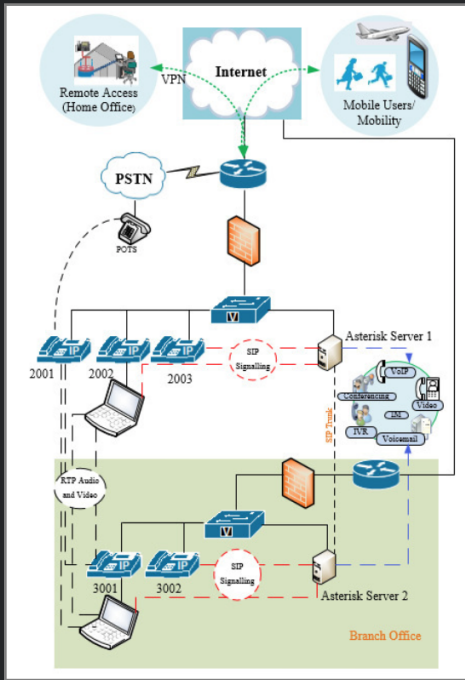




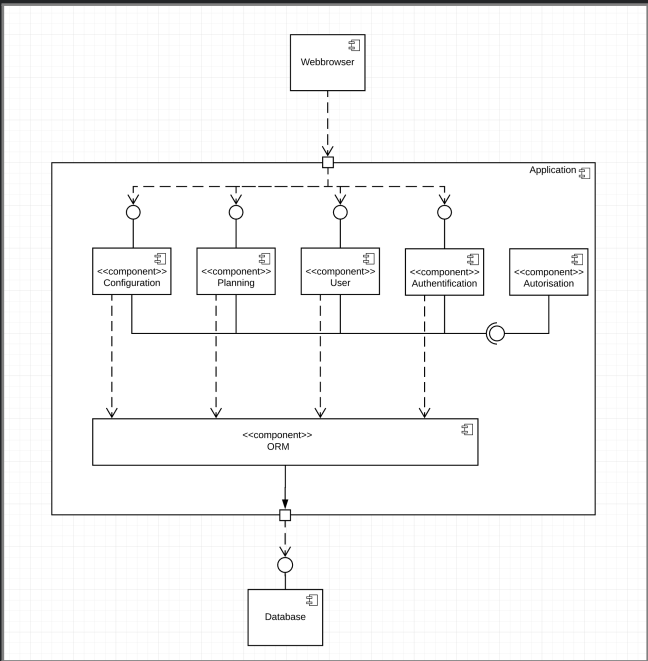
If I don't understand you,
it's your fault!

Languages

NOT like this:

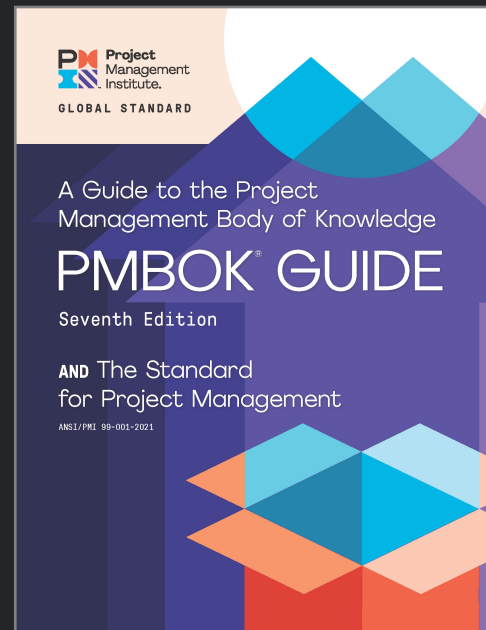


But like this:



UML + visual-paradigm.com

Stakeholders



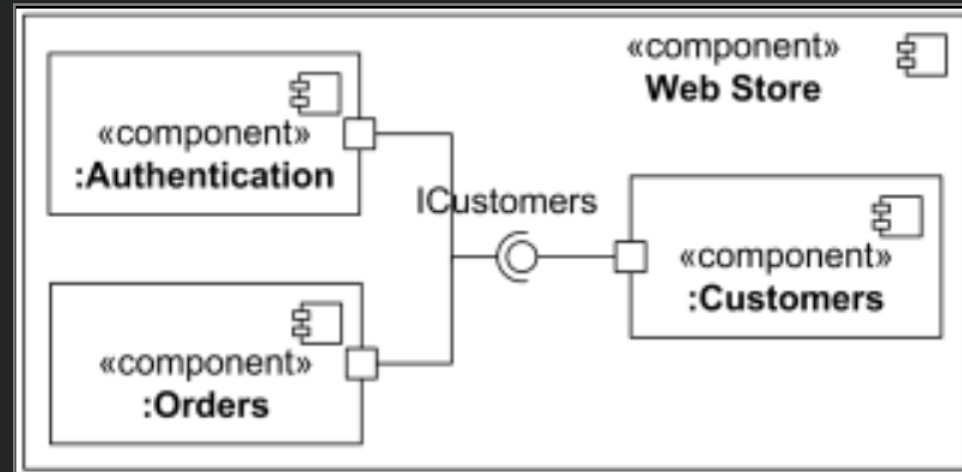
“Identify Stakeholders is the process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project.”

— A Guide to the Project Management Body of Knowledge (PMBOK®Guide), Project Stakeholder Management Knowledge Area

Concerns

Functional
and
Non-Functional Requirements


Elements



Rationale

Why MongoDB, why not MySQL?

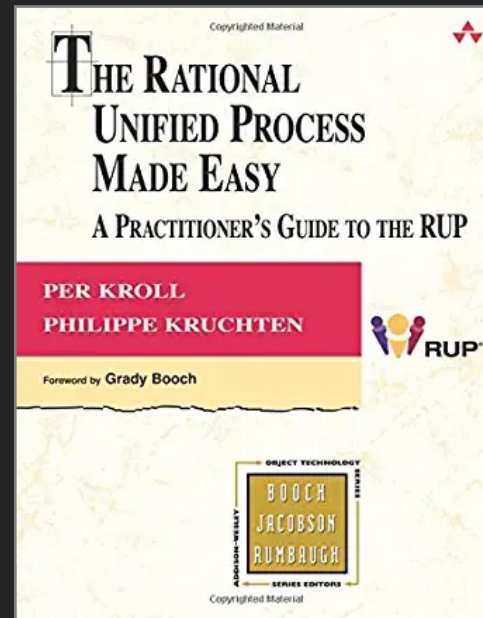
Multi-Criteria Decision Making (MCDM)
Architecture Trade-off Analysis Method (ATAM)
Decision Table
Multi Factor Analysis
Decision Matrix



Don't expect them to trust you,
make them trust your decisions.

Chapter #3:

SAD at RUP

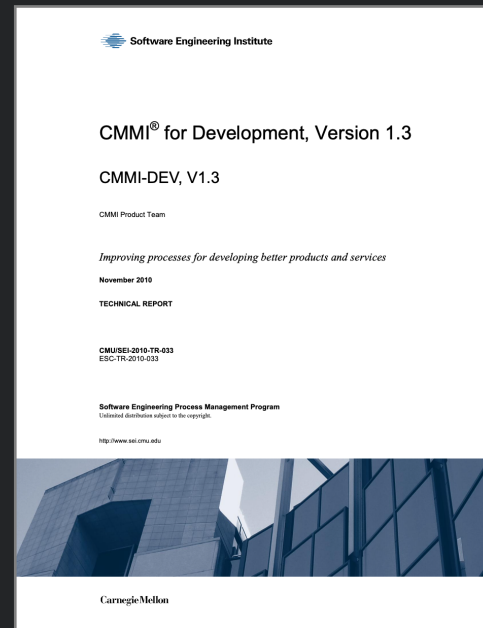


“The main responsibility of the architect is to describe the architecture of the system in a major artifact of the RUP product, called the Software Architecture Document (SAD). For many projects, this may be the only part of the design that is described in an actual document, as most design aspects can be documented in UML models and in the code itself.”

— The Rational Unified Process Made Easy:
A Practitioner's Guide to the RUP
Per Kroll et al.

Chapter #4:

TS at CMMI



“Detailed design is focused on software product component development. The internal structure of product components is defined, data schemes are generated, algorithms are developed, and heuristics are established to provide product component capabilities that satisfy allocated requirements.”


— CMMI for Development
Capability Maturity Model Integration (CMMI®)
Technical Solution (TS) Process Area

Chapter #5: **SWEBOK**



“Viewed as a process, software design is the software engineering life cycle activity in which software requirements are analyzed in order to produce a description of the software’s internal structure that will serve as the basis for its construction”

— Guide to the Software Engineering Body of Knowledge (SWEBOK), IEEE Computer Society, Chapter 2: Software Design



Stay away from *MS Word*,
instead, use \LaTeX with Git.

Chapter #6: **README**

```
# Sample Markdown

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod.

## Text basics

This is italic and this is bold. Another italic and another bold.

__Here is some quotation__. Lorem ipsum dolor sit amet, consectetur
adipiscing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation.

## Links

This is an [example inline link](http://example.com/) and [another one with a
title](http://example.com/ "Hello, world"). And [another][someref] one.

## Code |

This is inline code: `some code here`.

<script>
  document.location = 'http://example.com/?q=markdown+cheat+sheet';
</script>

```java
public class HelloWorld {
 public static void main(String[] args) {
 System.out.println("Hello, world!");
 }
}
...

[someref]: http://example.com "rich web apps"
[MarkdownREF]: http://daringfireball.net/projects/markdown/basics
[gfm]: http://github.github.com/github-flavored-markdown/
```




GitHub

Markdown  
by John Gruber  
since 2004



## UI mockups

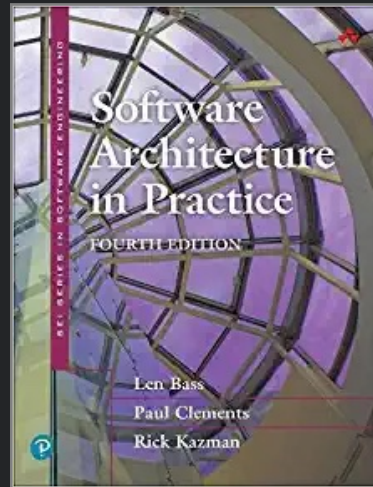
[mockups.com](#), [balsamiq.com](#), [sketch.com](#), [dribbble.com](#), etc.



Brevity is a virtue,  
redundancy is a sin.

Chapter #7:

## Books, Venues, Call-to-Action



“Software Architecture in Practice”  
by LEN BASS ET AL.



“Documenting Software Architectures: Views and Beyond”  
by PAUL CLEMENTS ET AL.

## Where to publish:

IEEE International Conference on Software Architecture (ICSA)



## Call to Action:

Create and explain the design of a QR-code generator app in the README.md file in a new GitHub repository. Sample: [www.4qrcode.com](http://www.4qrcode.com)

## Still unresolved issues:

- How to synchronize an SDD with the source code?
- How to generate the code from an SDD?
- How to embed diagrams into the source code?
- How to validate source code vs. the SDD?