COMP3004 Notes

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January 8, 2019

Contents

1 Introduction

1.1 Development Life Cycle

1.1.1 Requirements Analysis

- requirements
  - functional
  - non-functional
- functional model
- dynamic model
- analysis object model

1.1.2 High Level System Design

- subsystem decomposition
- system architecture strategies

1.1.3 Detailed Object Design

- detailed object model
  - class diagrams
- design patterns and contracts

1.1.4 Implementation

- map associations to
  - collections (easy)
  - storage (hard)

1.1.5 Testing

- unit testing
- integration testing
- system testing

1.2 Team Work

- we can't each do a part and put it together
- we have to do it all together

1.3 Tools

- VirtualBox
- VM
  - Qt Framework comes with it
  - Dia comes with it
- C++

1.4 Textbook

- textbook is a good indication of how much detail you need for deliverables
  - follow the arena case study
  - perfect level of detail

2 Software Engineering Overview

2.1 Definitions

- software engineering
  - software
    - code
    - application
  - engineering
    - technical process for achieving a task
    - building something
  - what **is** software engineering
    - requirements analysis
    - building software
  - what is **not** software engineering
    - building tiny little program
- system
  - what is a system in software engineering?
    - a very **large** piece of software
    - so big, we don't call it
      - a program
      - an application
- we need a **reliable process**
  - a *recipe*
  - why?
  - wanted:
    - **reliable** systems
    - **modifiable** systems
      - we don't want to throw away code to add a new feature
  - we need a **plan**

2.1.1 The Plan

- two ingredients
  - technical
  - management

Technical Aspects

- **understand** the problem
  - *how do we do this?*
  - **ask the client**
- figure out an **optimal solution**

Management Aspects

- keep things **on track**
- plan for change
  - *anything can change at any time*

2.2 Technical Aspects

2.2.1 Application Domain

- **relevant to the problem**

- the *client's world*
- airport example
  - planes
  - runways
  - gates
  - passengers
  - luggage
- we are **not** experts here
  - the *client* is

2.2.2 Solution Domain

- the **fix** for the problem
- *our* world
- GUI
- design patterns

2.2.3 Building Models

- what is a model?
- why do we need a model?
- what can go wrong?
- types
  - functional
  - dynamic
  - object

The Point of Models

- look at a small scale version
  - don't necessarily build a small scale version
  - look at some different *views* of it
- figure out
  - *how will it work?*

Modeling the Application Domain

- requirements analysis
  - **describe** problem to be solved
  - **describe** system requirements
  - **identify** objects required

2.3 Management Aspects

- communication tools
- configuration management
- rationale management
- software development process

2.3.1 Dealing With Change

- the earlier the better

2.3.2 The Stakeholders

- client
  - users
  - interacts with
    - project managers
    - requirements team manager
      - QA
- development team
  - project manager
  - architect
  - analyst
  - designers
  - programmers
  - testers
  - operations

2.4 Software Development Phases