

SOFTWARE PROCESSES

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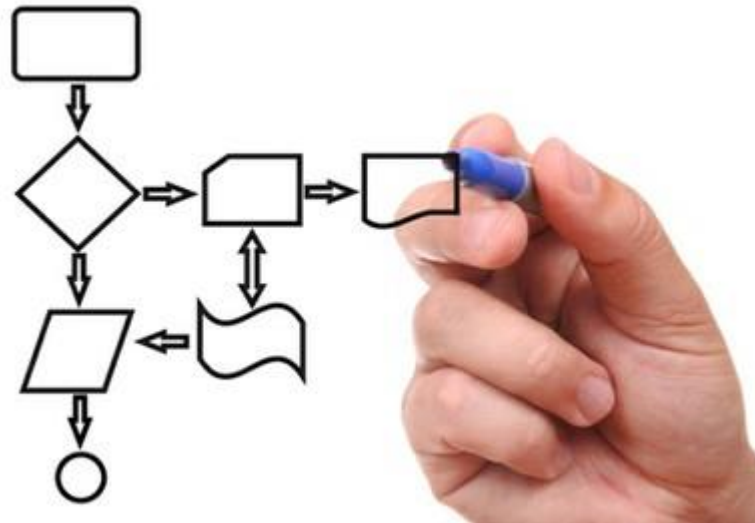
A Software Process: Who is like this?

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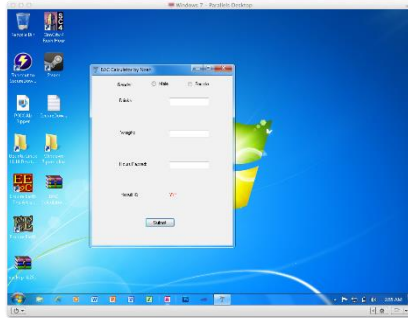
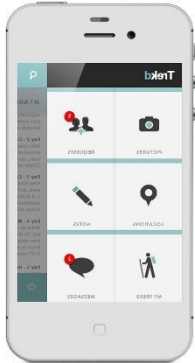
Is there anyone like this?

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Recap: Software Dev. is complex and varied

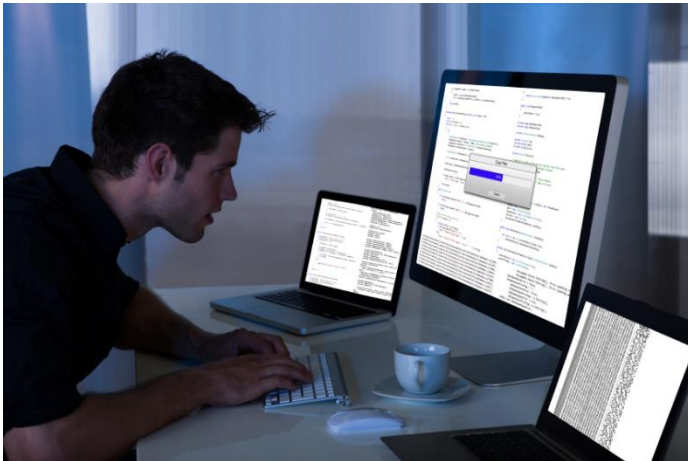
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- Ada
- 3 levels of redundancy
- Different dev teams

Difference between these two?

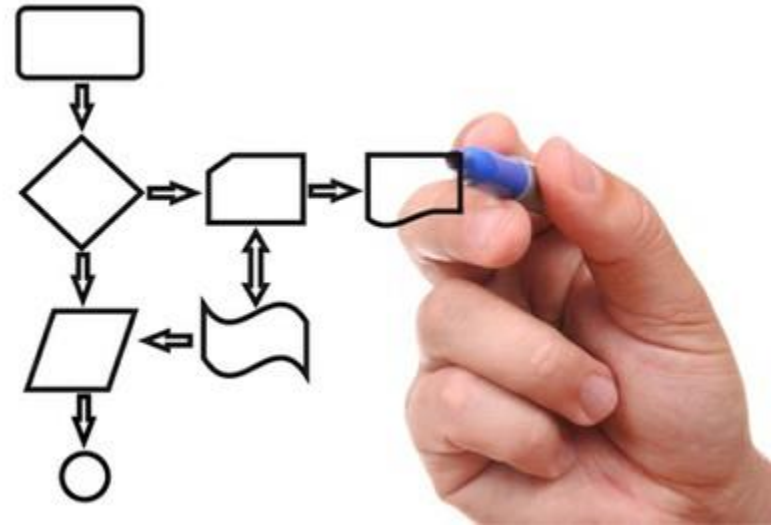
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Bad Process

Bad Engineer

VS



Good Process

Good Engineer

Building a house

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□ Plan

- ▣ Sketch the layout/structure
- ▣ Determine how the components will fit



□ Construction

- ▣ Laying foundations/block laying/engineer testing

□ Deployment

- ▣ Delivered to the customer who provides feedback list



The software process

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- A structured set of activities required to develop a software system
- Four fundamental process activities
 - ▣ Specification
 - ▣ Development
 - ▣ Validation
 - ▣ Evolution
- The foundation of software engineering is in the **process**
- **Goal:** To efficiently and predictably deliver a product that meets the requirements

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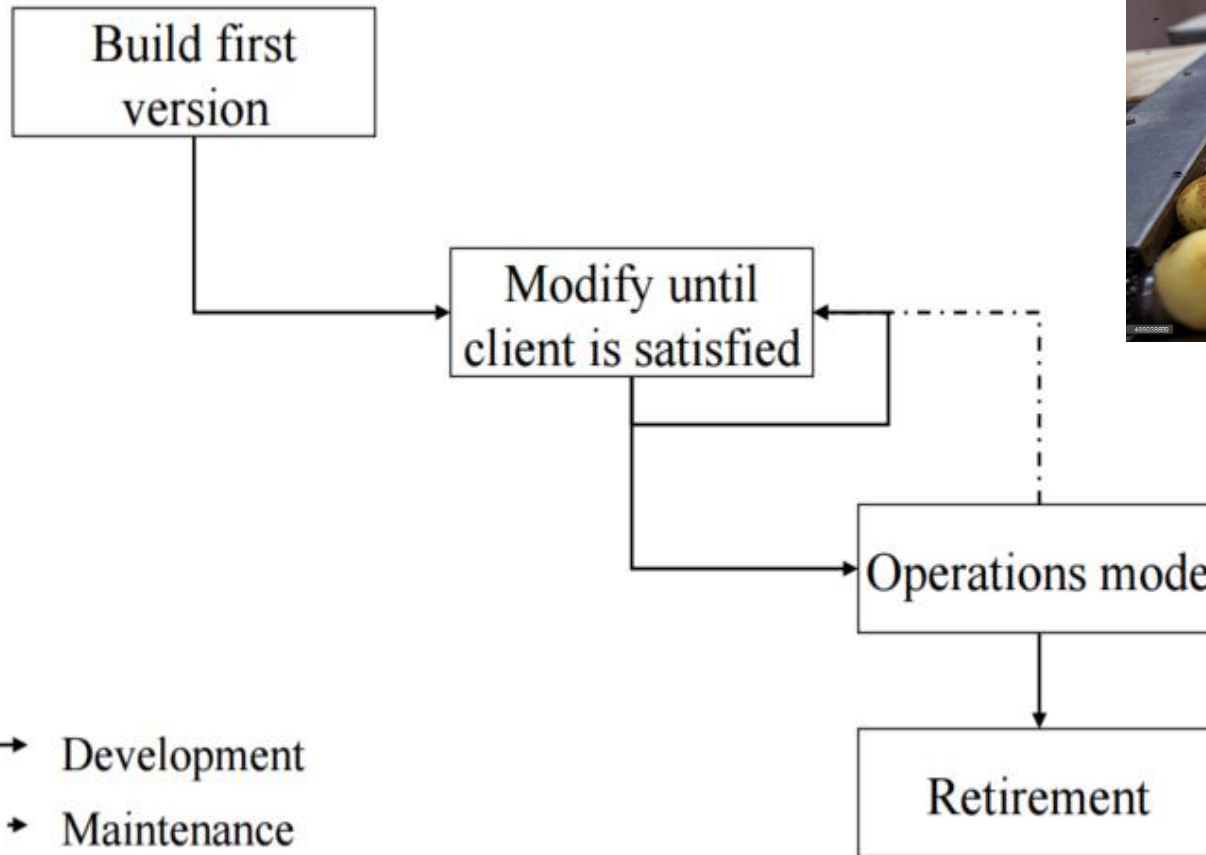
Motivating case

- You've been hired by a local independent retailer to build their potato peeling system

gettyimages®
Bloomberg

Build and fix model...worst approach

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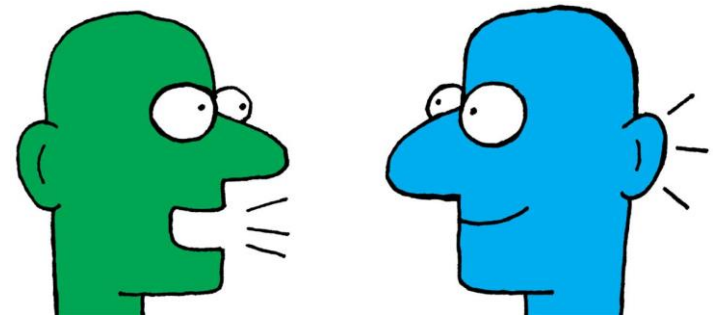


Software Process Model

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□ 1) Software Specification

- Talk to the customer
- Understand the problems
- Talk to any relevant stakeholders



□ 2) Software Development

- Map out the tasks
- Design the software
- Develop the solution

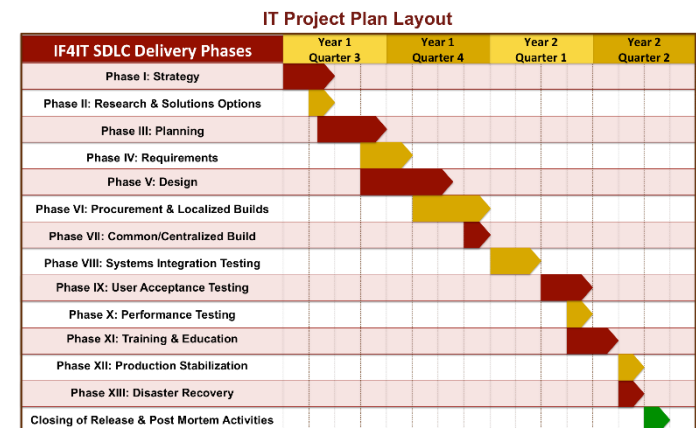


Figure: Example Layout of SDLC Phases as Key IT Project Milestones

Software Process Model...

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- 3) Software validation
 - ▣ Does it meet requirements
 - ▣ Is it what the customer wanted

- 4) Software evolution (maintenance)
 - ▣ Modified to adapt
 - ▣ Changes in requirements
 - ▣ Customer & Market conditions



Software Engineering Practice

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- 1) **Understand the problem** (*Communication and analysis*)
 - ▣ Who are the stakeholders?
 - ▣ What are the unknowns?
- 2) **Plan the solution** (*Modelling and software design*)
 - ▣ Have we seen this problem before?
 - ▣ Has a similar problem been already solved? Plagiarism
 - ▣ Can sub problems be found?
- 3) **Carry out the plan** (*Write the code*)
 - ▣ Does the solution conform to the plan?
 - ▣ Has the code been reviewed for correctness?
- 4) **Examine the result** (*Test it*)
 - ▣ Is each component testable?
 - ▣ Does the solution produce results as defined originally?

General Software Engineering Questions

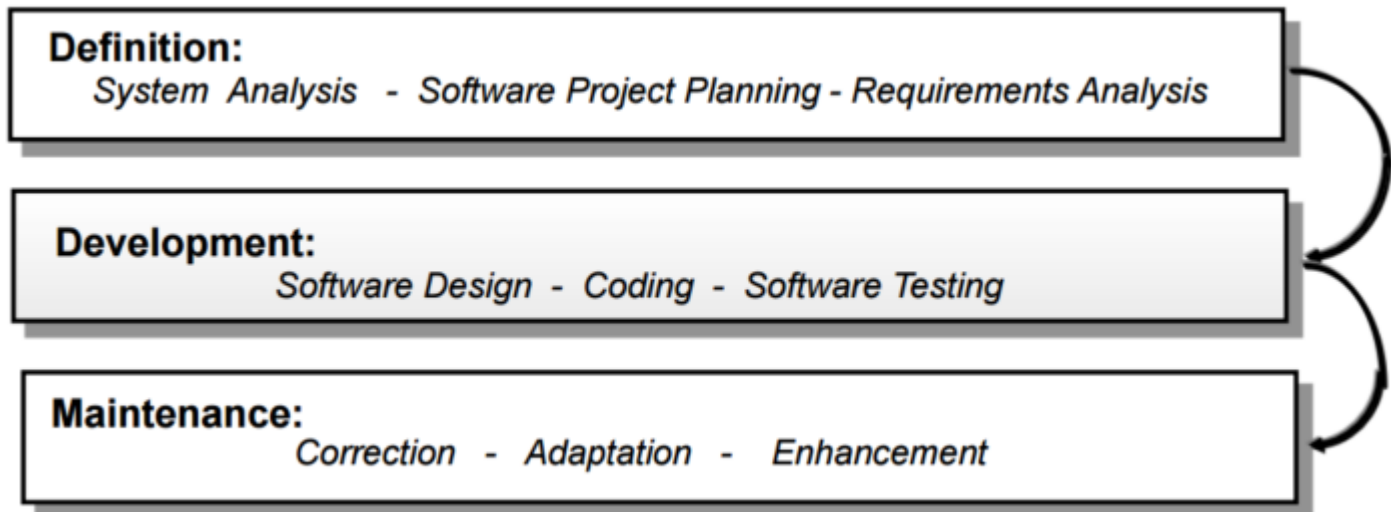
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- **What** is the problem to be solved?
 - ▣ Requirements definition
- **What** are the characteristics of the software (system) used to solve the problem?
 - ▣ Analysis
- **How** will the system be realised/constructed?
 - ▣ Design
- **How** will design and construction errors be uncovered and dealt with?
 - ▣ Test
- **How** will the system be supported long-term?
 - ▣ Maintenance

Overview of Software Engineering

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- There are three generic phases, regardless of paradigm:
 - Definition, a focus on the *What*.
 - Development, a focus on the *How*.
 - Maintenance, focuses on *Change*



Software Engineering should...

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- ❑ Provide a clear statement of the project mandate & objectives;
- ❑ Create effective means of communication;
- ❑ Increase user involvement & ownership;
- ❑ Provide an effective management framework to support productivity & pragmatism;
- ❑ Establish quality assurance procedures;
- ❑ Provide sound resource estimation and allocation procedures;
- ❑ Ensure the effectiveness and durability of systems produced;
- ❑ Encourage the re-usability of code and/or solutions;
- ❑ Reduce the organisation's vulnerability to the loss of software development personnel (MJ);
- ❑ Reduce and support post implementation maintenance of systems;