From The Industry: Software Engineering & Project Management

Rohit Jha

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Fr. C.R.I.T.
B.E. in Computer Engineering (2009-13)

Tata Consultancy Services (TCS)
Software Developer (2013-15)

University of California, San Diego (UCSD)
M.S. in Computer Science (2015-present)
Specialization: Software Engineering, Programming Languages and Compilers

Software Development in the industry

1. Customer   Customer is NOT always right
2. Communication   Learn effective communication
3. Quality   Learn Quality Assurance
4. Risks   Learn to be scared
5. Documentation   Learn what to write & how to write well
6. Competition   Learn to keep improving

6.4%

of software projects succeeded in the 1990s

39%

of software projects succeeded between 2003-12

-- CHAOS Report (2012)

Trends

Mobile

Cloud

Big Data

Visualizations

IoT

Agile Development

Iterative & incremental

Risk-oriented

Adaptive

Continuous evolution

Parallel development

Common Methodologies: Scrum, TDD, BDD, XP

7 Steps to Highly Effective Software

Step 1 - Vision

Describe your product - attractive in the marketplace and affordable to build

Identify users, partners and competitors

Identify risks that may lead to failure

Plan to resolve most serious risks first

End Product: The Vision Statement

Step 2 - Requirements

Interview users

Ethnography - Watch users in their "habitat"

Textual notes, pictures, audio and video recordings

Scenarios

End Product: Software Requirements Specification (SRS)

Step 3 - Estimation

Effort and cost estimation

Risk assessment

Projects funded according to time

End Product: Estimation Document

Step 4 - Software Architecture

Define how users interact with product

Design by Contract

Design Patterns

UML

End Product: High-Level Software Design Document

Step 5 - Software Design

Define the product's internals

All class members, DB schema

Given these details, any team should be able to build the product

End Product: Low-Level Software Design Document

Step 6 - Testing

Test cases for all scenarios

>1,000 for large and complex product

Build Tests

Unit → Integration → System → User Acceptance → Final Release

Release Candidates (RC) → Alpha → Beta → Final Release

End Product: Test Plan

Step 7 - Development

Involves developing, testing and integration

Version Control - Git, Microsoft Team Foundation Server, Subversion

In case of issues, loop to Step X

End Product: Working Software Product

Product Delivery

Deploy product, train users
...and hope everything works!

"There are two ways of constructing a software (design): One way is to make it so simple that there are obviously no deficiencies, and the other way is to make it so complicated that there are no obvious deficiencies. The first method is far more difficult."

C.A.R. Hoare

Questions?

"Curiosity is the wick in the candle of learning."
William Arthur Ward

Thanks!

Rohit Jha

Email: rohit305jha@gmail.com

Web: cseweb.ucsd.edu/~r1jha

Slides: cseweb.ucsd.edu/~r1jha/industry.pdf