



Software Engineering

A Short Overview



The beginning...

IBM
1911

HP
1939

The first **Computer**

????

The **Transistor**
1947

The Turing machine (Alan
Turing, 1936)?

Intel 1968

Moore's Law
1965

The first commercial **Microprocessor**
(intel 4004)

1971

Internet

The beginning

Apple I, 1977



Byggesett, måtte sette sammen komponentene selv

IBM PC with DOS, 1981

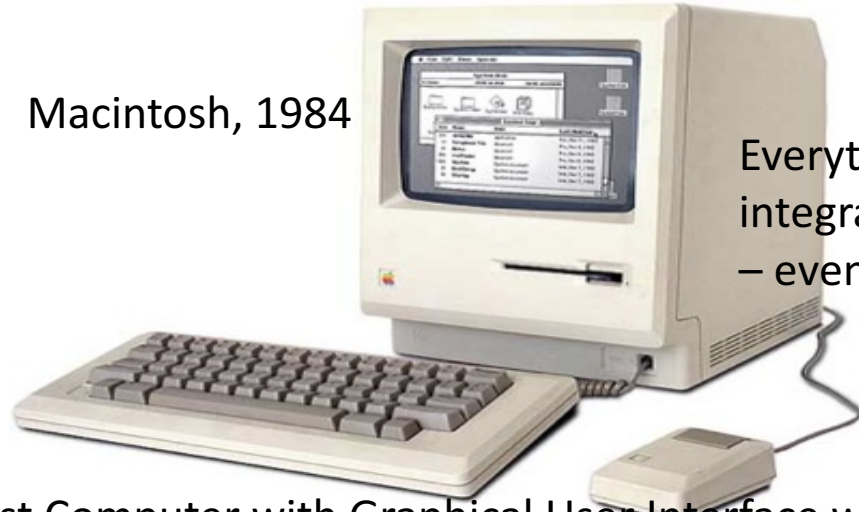


Apple II, 1977



Attach a screen and you are up and running

Macintosh, 1984



Everything is integrated – even the screen

First Computer with Graphical User Interface with Mouse

Mac OS 1.0

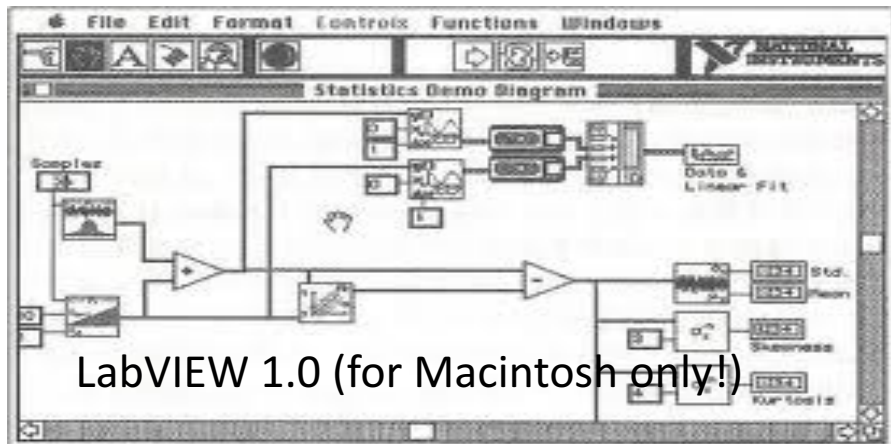
The beginning



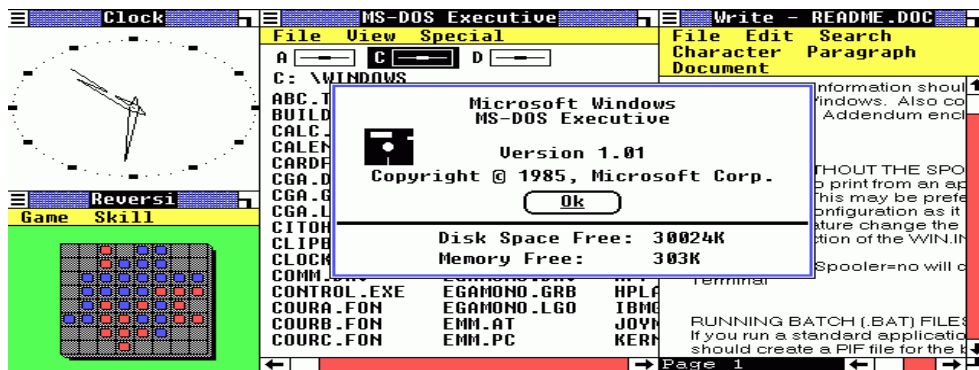
1984: Macintosh



1985: Windows 1.0



LabVIEW 1.0 (for Macintosh only!)



Today

Smartphones



Ultrabooks



Smartwatches

Apps

Web



Smart TVs



Tablets

Muligheter!



Kjenner du disse??



Muligheter!

“Jeg glemmer ikke jobbintervjuet, der jeg skrev kode på tavlen foran dem i to dager i strekk. Svetten rant.”

“De siste syv årene har jeg vært med på det som må være et av tidenes største industrieventyr.”

Hvordan ser en typisk arbeidsdag ut for deg? – “Det kommer an på fasen i et prosjekt. Tidlig i utviklings- eller konseptfasen er det mye møter. Vi jobber i Scrum-prosess med daglige møter. Senere mot leveringstid er det mye utvikling og koding.”

Atle (42) står bak Amazon-skyen

INTERVJUET: Fikk drømmejobben på surfetur i Sør-Afrika.

<http://www.digi.no/919886/atle-42-staar-bak-amazon-skyen>

Du må ta mulighetene når de byr seg – men det kreves hard arbeid!!
Det å være Systemutvikler er ikke en 9-4 jobb!

Telemark University College Weather System

Telemark University College Weather System App gives you current weather data and various weather trends from a weather station located in Telemark University College, Porsgrunn. Features:

- Showing Current Weather and Trends
- Live Updates from Telemark University College Weather Station



DETAILS:

Category: News & Weather / Weather

Size: 3.2 MB

Price: Free

Age rating: 12+

Publisher: Hans-Petter Halvorsen

Supported processors: x86, x64, ARM

Website: [Telemark University College Weather System website](http://telemark-university-college-weather-system.com)

Editor rating: ★★★★★★★★ (8.5 / 10)

Award:

Muligheter!

Utviklet av en HiT/TF student

Best Windows 8 App Weather System



Download for free
from Windows Store



Telemark University College Weather System

<http://home.hit.no/~hansha/?page=weather>

<http://bestwindows8apps.net/telemark-university-college-weather-system>

<http://apps.microsoft.com/windows/en-us/app/telemark-university-college/45635f21-4fd0-4452-ad3c-c7a0caa8c402>





”Dr. Mandel fastslår at ingen annen oppfinnelse i historien har hatt større effekt på verdensøkonomien og arbeidsmarkedet på så kort tid som mobiltelefonen, og spesielt kombinasjonen av IOS og App Store.”

APPER: IOS leder an i app-økonomien. (Foto: Apple) <http://www.cw.no/artikkel/app/velkommen-til-app-okonomien>

App-utvikling skaper millioner av jobber

Apple kan melde om App Store-rekord i romjulen, og gjennom app-butikkens livsløp har Apple til nå utbetalt over 350 milliarder kroner til utviklere - også noen i Norge.

Software Developer/Software Engineer

Utviklingsjobb i programvarehus

Vi har for tiden stor etterspørsel etter dyktige .Net utviklere.
Er genuint opptatt av programmering og har relevant erfaring ber vi deg kontakte oss.

Kvalifikasjoner:

Minimum Bachelor med vekt på programvareutvikling

Ønskelig med noen års relevant erfaring - solid relevant praksis og konkret erfaring kan kompensere for utdanning

Det er ønskelig at du har god kjennskap til:

C#, .Net-rammeverk og ASP.Net

Javascript

HTML5,

SQL databaser

Smidige utviklingsprosesser (scrum etc)

Gode ferdigheter i norsk og engelsk skriftlig og muntlig er nødvendig

Søknadsfrist: Snarest

Typical Job Ad

Erfaren og engasjert .NET Systemutvikler

søker etter en systemutvikler med lidenskap og engasjement for teknologi og programmering til vårt utviklingsteam i Bodø. Du bør ha relevant erfaring fra systemutvikling men med de rette personlige egenskapene kan du også være aktuell dersom du er nyutdannet kandidat på master-/ bachelornivå.

Dette er kompetansen vi ønsker:

- Høyere utdanning på høyskole-/universitetsnivå innen IT.
- Erfaring med programmering/utvikling på løsninger på .Net/Java teknologi.
- Erfaring med utvikling/modellering av SQL databaser mot fortrinnsvis MS SQL Server eller andre relasjonsdatabaser.
- Fordel med erfaring fra webutvikling på ASP.NET Webforms/MVC og Visual Studio (C#).
- Kunnskap om web teknologier som XML Web Services.
- Kjennskap til Scrum/Kanban, Testdrevne utvikling (TDD) og utvikling mot mobile enheter er et pluss.
- I tillegg til faglige ambisjoner må du være kreativ, ha evne til nyskaping og kunne jobbe i team.
- Gode norsk- og engelskkunnskaper, både muntlig og skriftlig er en selvfølge.

SYSTEMUTVIKLER .NET

På vegne av kunde søker Academic Work en fremoverlent og nysgjerrig systemutvikler!

OM BEDRIFTEN:

Vår kunde har spesialisert seg innen HR og Lønn. De leverer IT-løsninger og konsulent- og outsourcingtjenester. Selskapet har over 15 000 kunder fordelt på privat og offentlig sektor og over 45 års arbeidserfaring.

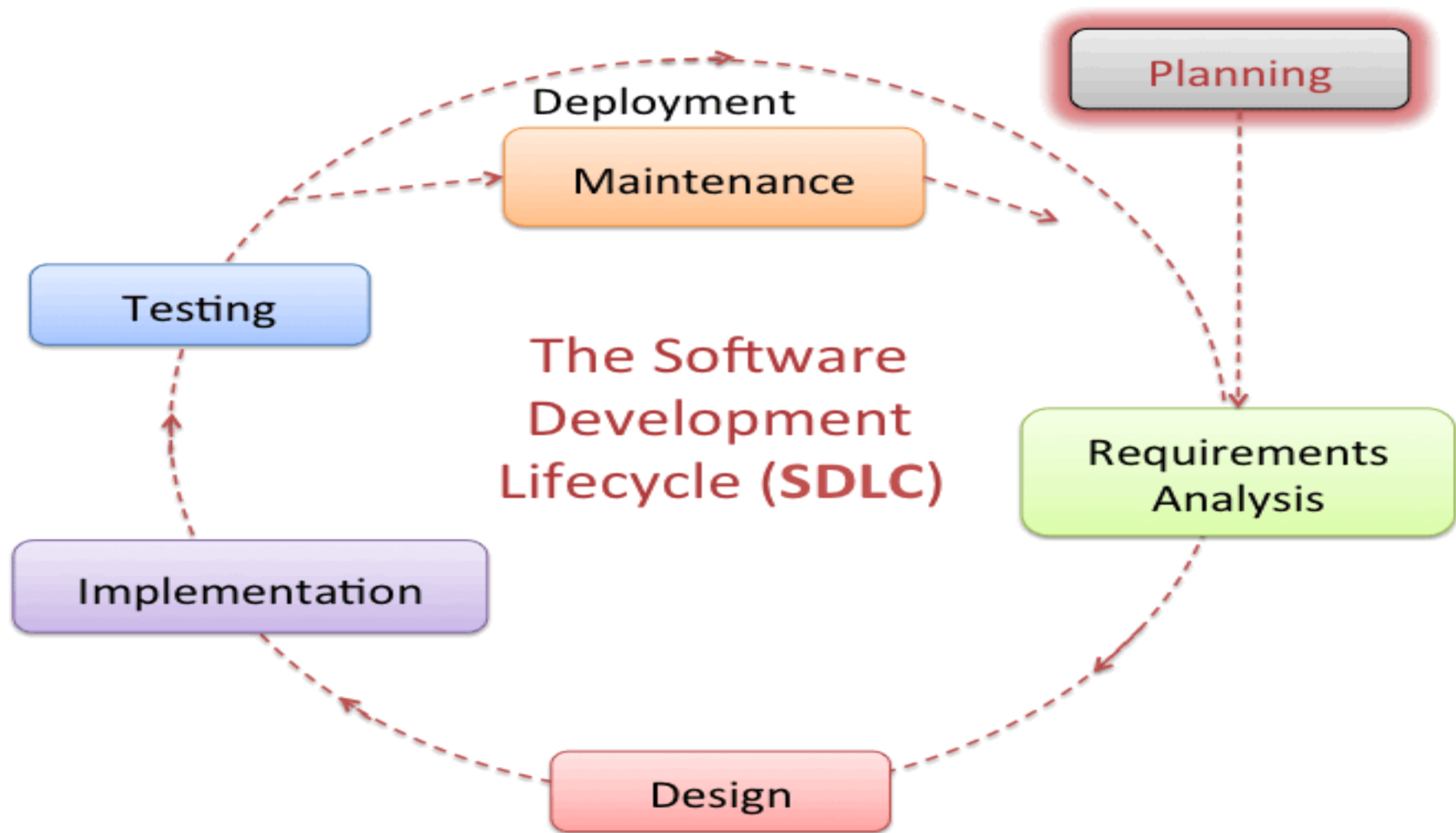
ARBEIDSOPPGAVER OG ANSVAR:

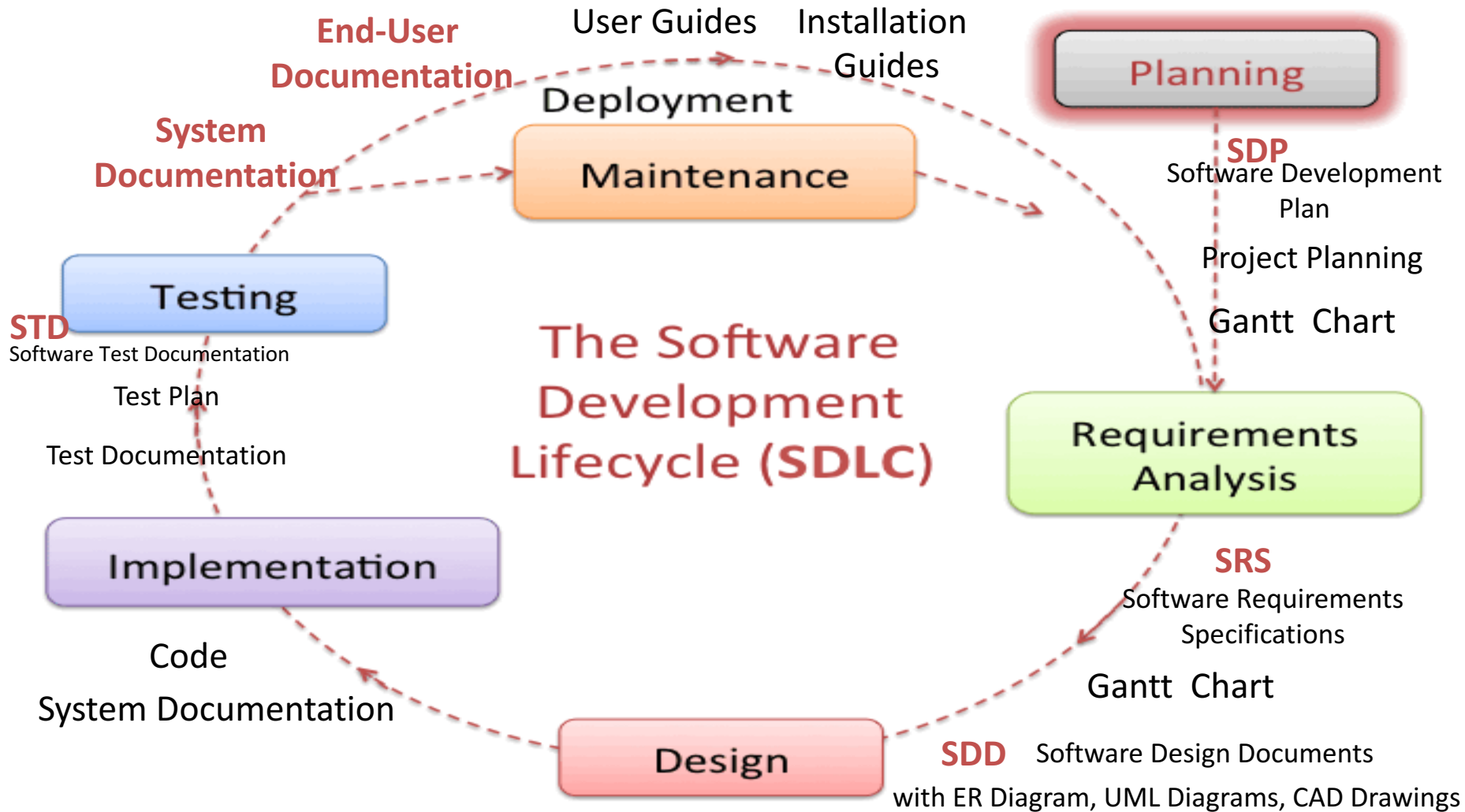
Dine primære arbeidsoppgaver vil bestå av å utvikle selskapets kjerneapplikasjoner (standard lønssystem). Du vil ha muligheten til å inngå i en helhetlig prosess med alt fra å forme, designe, teste og dokumentere data. Teamet du vil inngå i arbeider etter SCRUM modellen. På sikt vil det kunne påregnes noe kundekontakt også.

VI SØKER DEG SOM

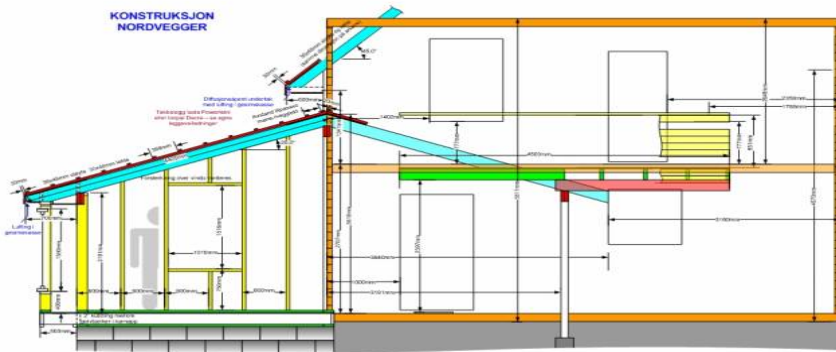
- Er utdannet innen IT, bachelor eller master
- Er svært motivert til å bli en .Net-utvikler
- Gjerne har erfaring med .Net rammeverket og Visual studio
- Har noe kjennskap til WCF/WPF/WF/Javascript/HTML5

Som person er du utadvendt og har god driv! Du er løsningsorientert både teknisk og funksjonelt, og evner å sette deg inn i nye arbeidsmetoder raskt. Du takler å jobbe under tidspress og tar ansvar. Personlige egenskaper vil bli vektlagt.





Requirements/Design



Plans made and approved

Beta



Building structure finished,
Inside work on track

RC



Furniture, Flowers and
small adjustments missing

Alpha



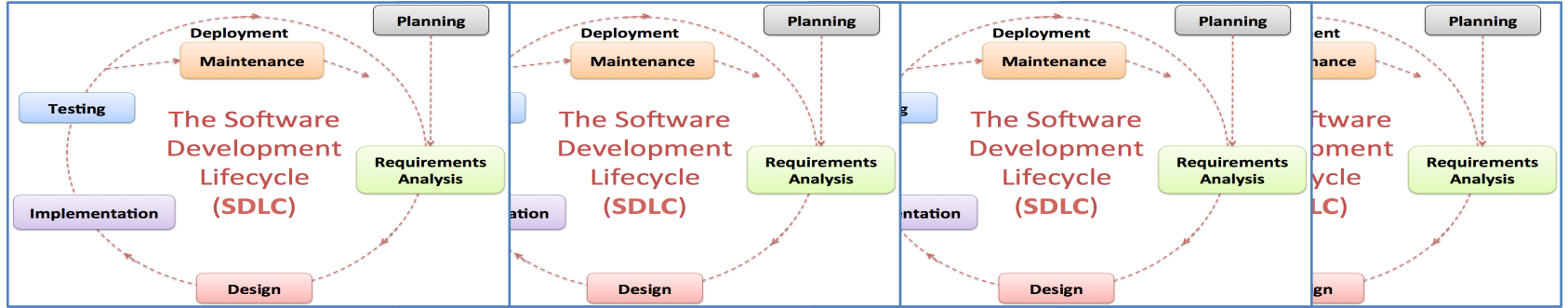
Foundation finished, building structure started
A "proof" that you can do it, PoC (Proof of Concept)

RTM



Ready for Sale or Move in

Real life Software Development



Project Start

Project Finished

... .. Iterations/Sprints

The Software is being tested internally from beginning to the end (every day)

Alpha

Testing/Bug Fixing/
Refactoring/Redesign

Beta
Beta1
Beta 2
Beta 3

Eksternal Testing
Testing/Bug Fixing/
Refactoring/Redesign

RC
RC1
RC2

Eksternal Testing

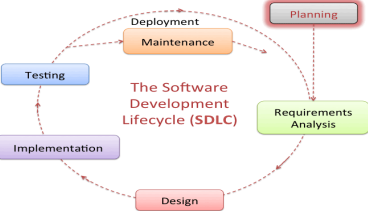
RTM

...

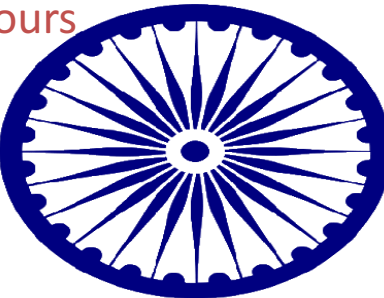
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Software Development

Daily Scrum Meetings

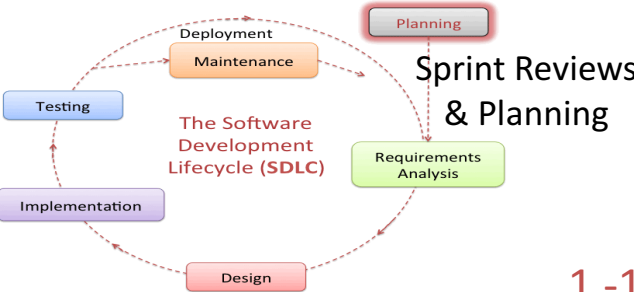


24 hours



Days

Working Software at all times.
Testing every day

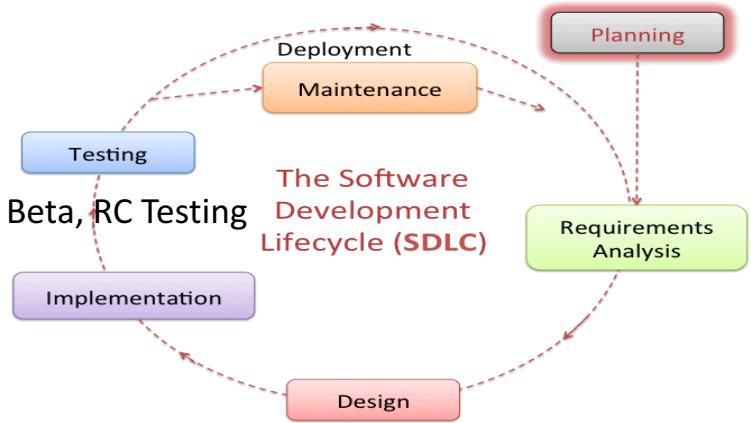


2-4 weeks

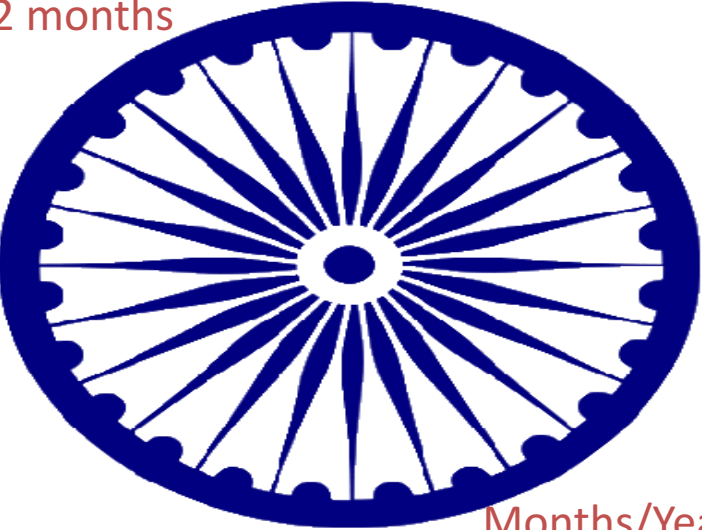


Weeks

Internal Iterations/Sprints



1 -12 months



Months/Years

Public Beta, RC Releases

Why Do Reviews, Quality Control and Testing?

We will do Reviews, Quality Control and Testing at different levels through the whole software lifecycle

Cost per defects

SDLC (Software Development Life Cycle)

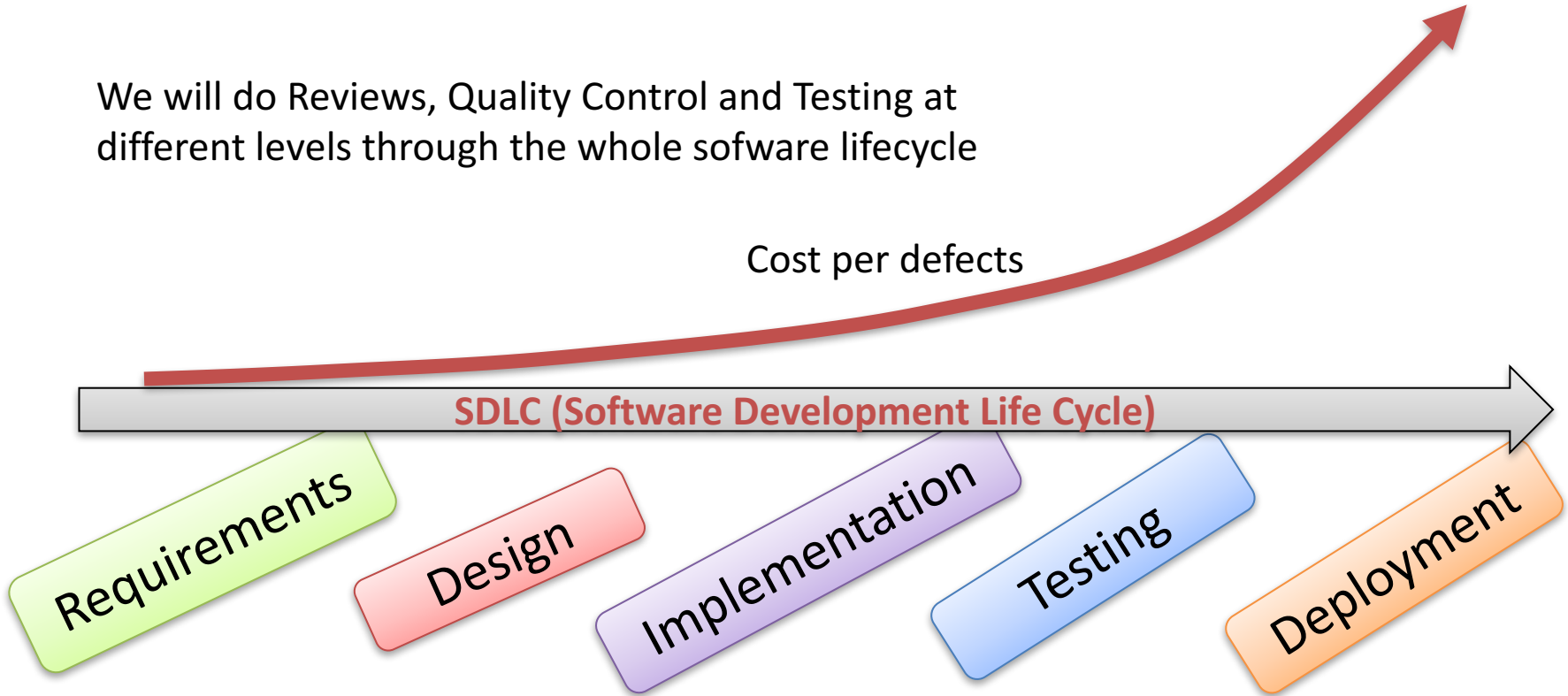
Requirements

Design

Implementation

Testing

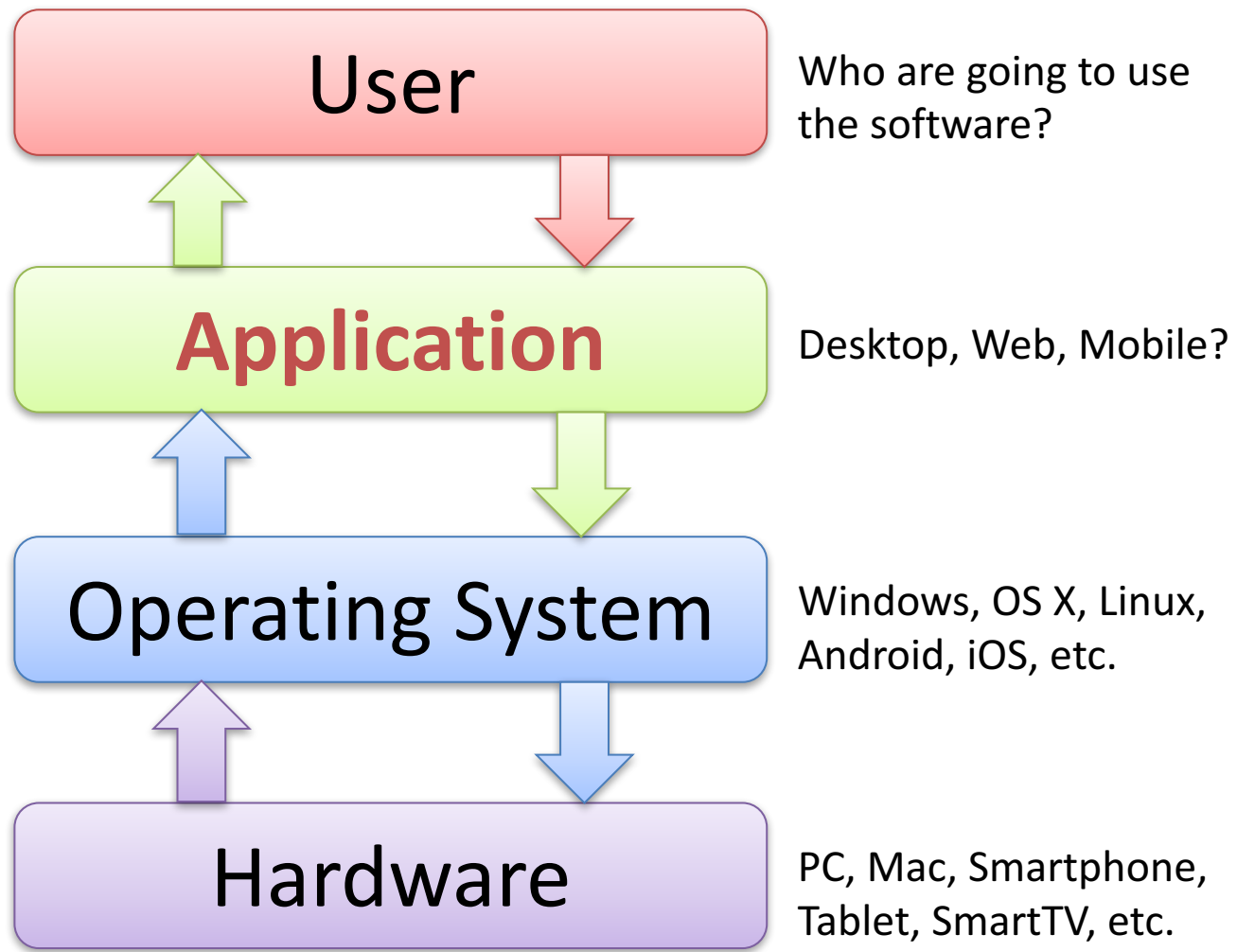
Deployment



Software

Development

Planning, Requirements, Design, Implementation, Testing, Deployment, Maintenance, etc.



Software Development

Windows Server 2016

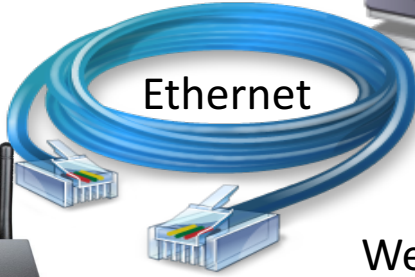


Clients



Server

Wi-Fi



Ethernet



LAN

Router

OPC Server



Web Server

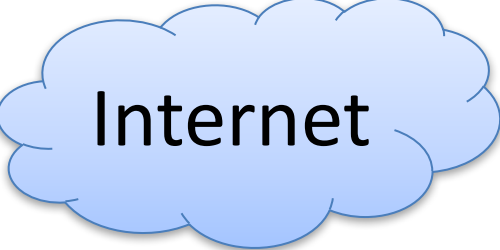


IIS

Database Server



SQL Server



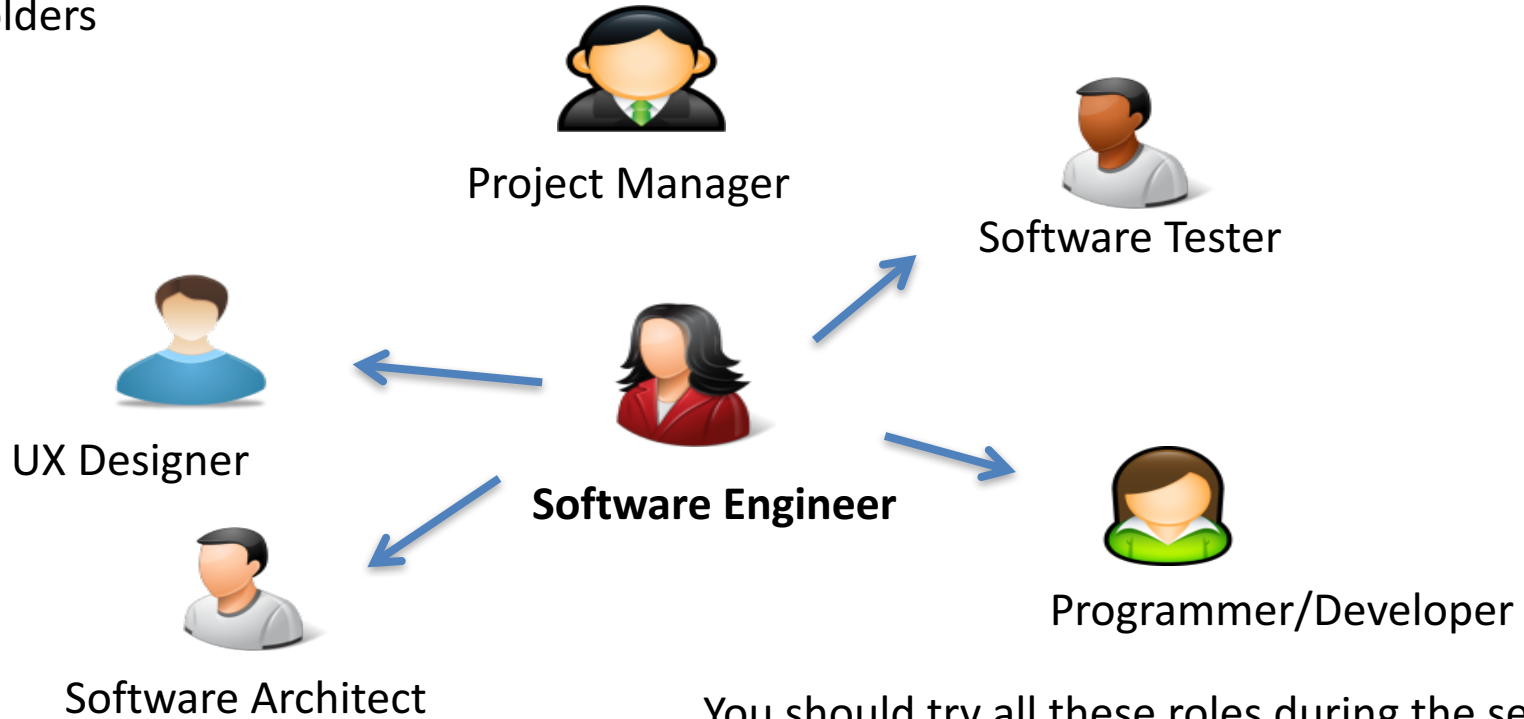
Internet

Typical Network & Infrastructure



Stakeholders

Software Team



You should try all these roles during the semester

A System Engineer is a general person that could be a Programmer, Architect, Designer, Tester in different phases in the project, or he could be a tester in one project and a programmer in another project – all in one person. That is usually the case in small companies, while in larger companies these roles (designer, tester, programmer) could be a full-time job.

Scrum

A Framework for Software Development

Working
Software at
all times!



Iterative approach

Scrum at Microsoft:



<http://www.youtube.com/watch?v=YR84qH6d7QE&feature=youtu.be>

Working Software at all times!

Scrum

Scrum Members:



Stakeholders



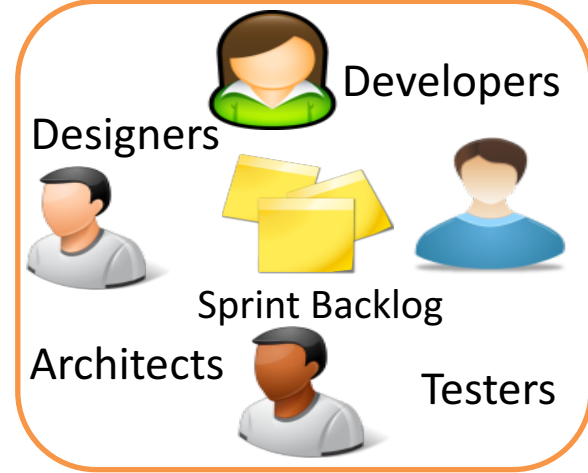
Product Backlog



Product Owner



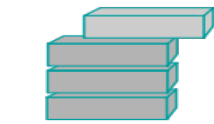
Scrum Master



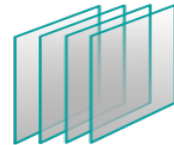
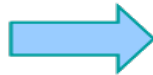
Development Team

3-9 persons

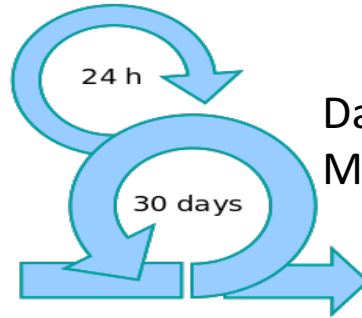
Scrum Process:



Product Backlog



Sprint Backlog



Sprint

Daily Scrum Meetings
Max 15 min.



Working increment
of the software

Sprint Review

Software Requirements & Design

Requirements (WHAT):

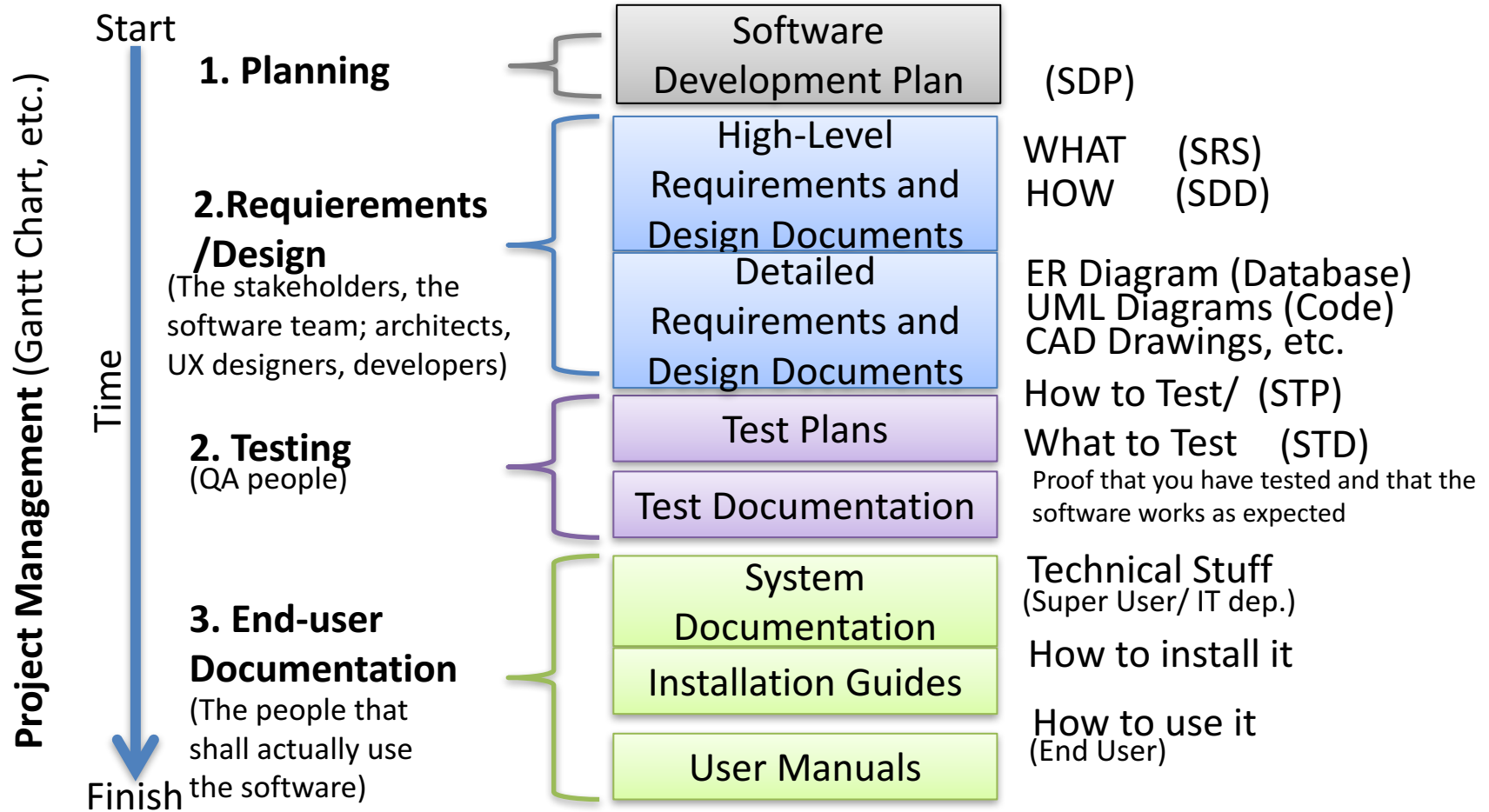
- **WHAT** the system should do
- Describe what the system should do with Words and Figures, etc.
- **SRS** – Software Requirements Specification

Software Design (HOW):

- **HOW** it should do it
- Examples: GUI Design, UML, ER diagram, CAD, etc.
- **SDD** – Software Design Document

Many dont separate SRS and SDD documents, but include everything in a Requirements document. **In practice, requirements and design are inseparable.**

Typical Software Documentation





Learned in
previous courses

Your Toolbox

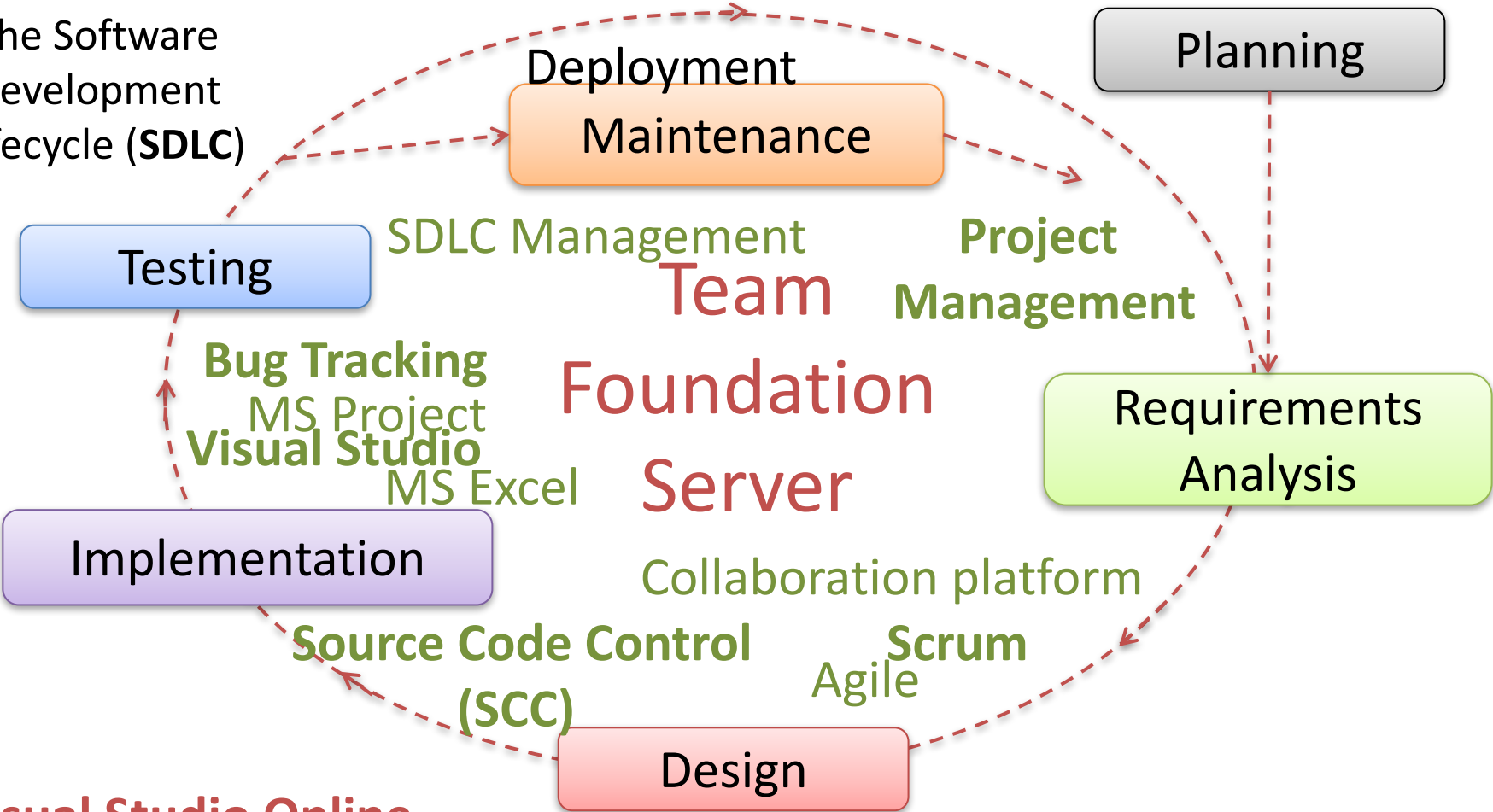
- PC
- Programming and Programming Languages (e.g., C#)
- IDE (Integrated Development Environment) (e.g., Visual Studio)
- Software Frameworks (e.g., .NET)
- **SCC** Tool (Source Code Control) (e.g., Team Foundation Server, TFS)
- **ALM** Tool (Application Lifecycle Management) (e.g., Team Foundation Server, TFS)
- Knowledge about basic **Software Engineering** (Requirements, Planning, Testing, and Development Processes like Agile, Scrum, etc.)

Focus in this Course

You cannot do a good job as a software developer without some proper tools!

Team Foundation Server (TFS) is an Application Lifecycle Management (ALM) system

The Software Development Lifecycle (SDLC)



Visual Studio Online

Team Foundation Server (TFS)

Server

Clients

Others

TFS

Services

Repository

SQL Server Git
(TFVC)

Team Foundation Server (TFS) is an Application Lifecycle Management (**ALM**) system

LabVIEW

MSSCCI Provider

Eclipse

Web Access

MS Excel

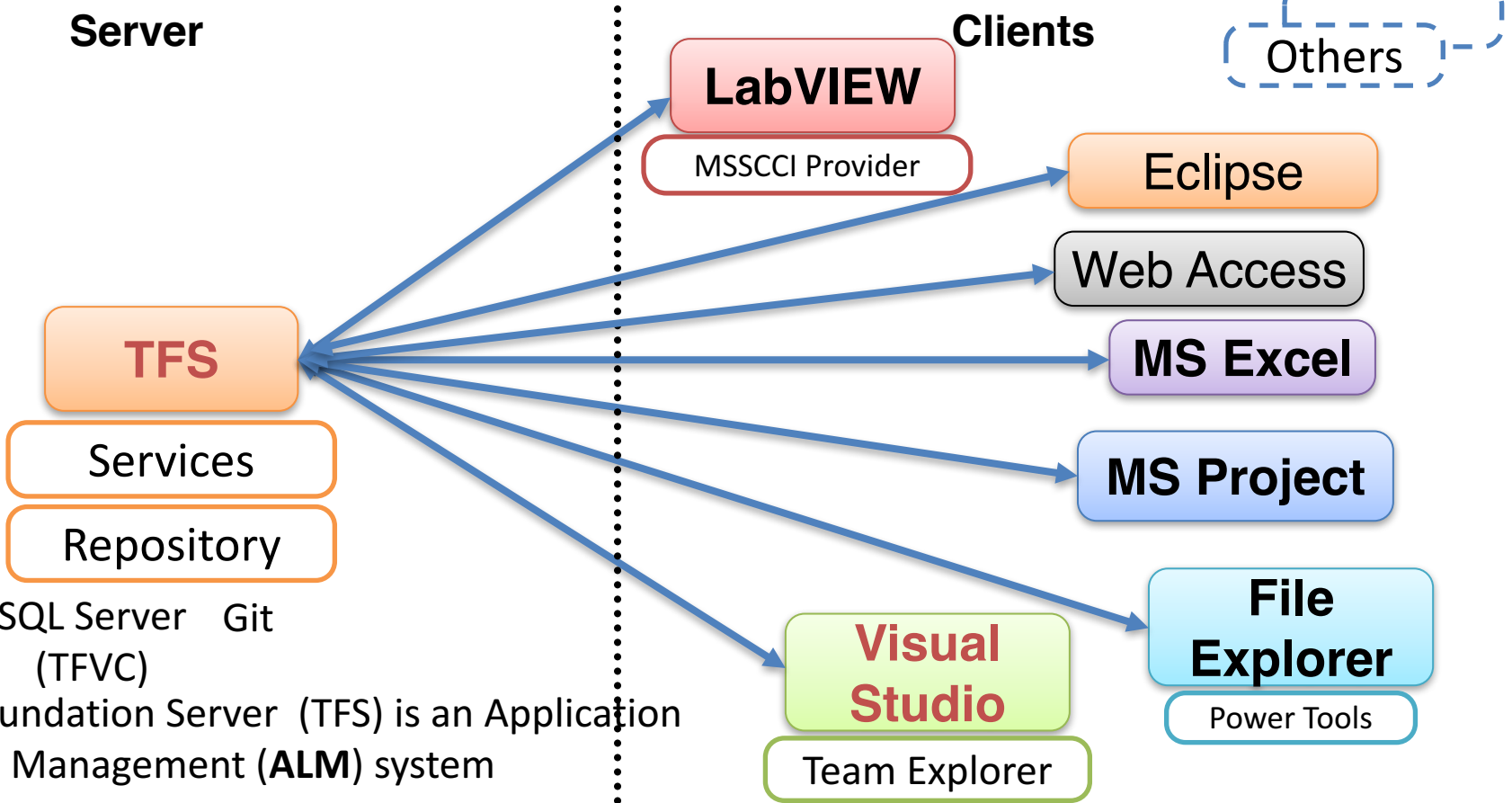
MS Project

Visual Studio

Team Explorer

File Explorer

Power Tools



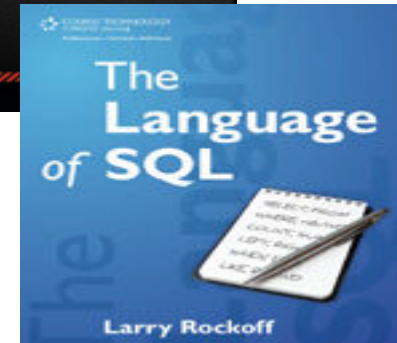
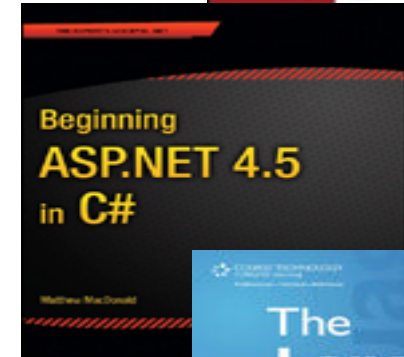
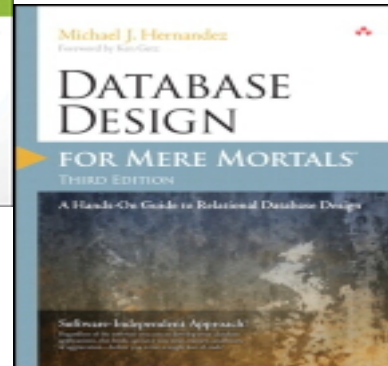
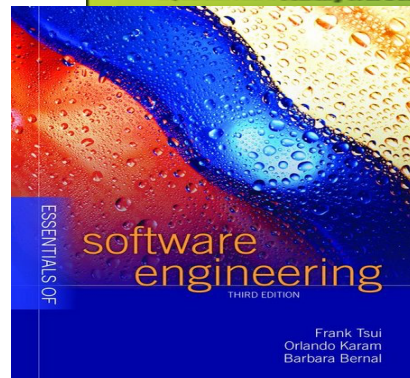
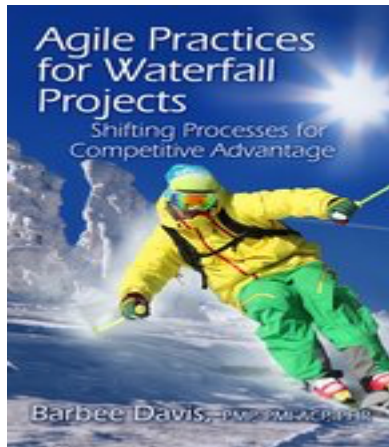
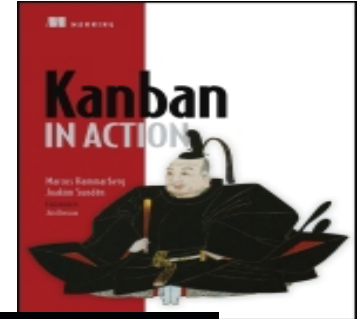
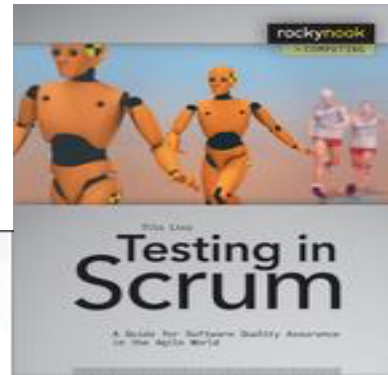
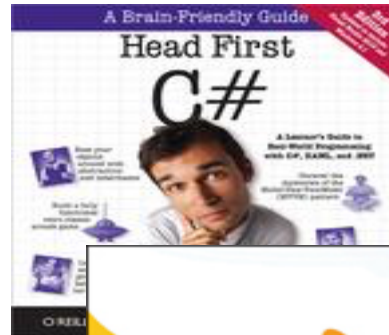
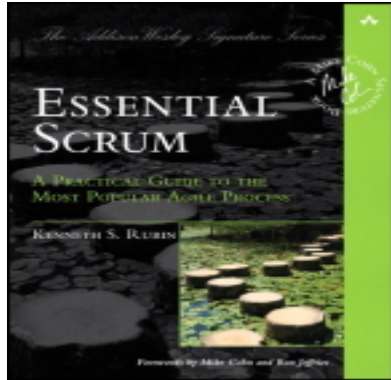
Visual Studio Team Services (VSTS)

- VSTS is a Source Code Control (**SCC**), Bug Tracking, Project Management, and Team Collaboration platform
- Integrated with Visual Studio
- Web-based Project Management, including Scrum
- Free for up to 5 users

www.visualstudio.com

eBooks from Safari Books Online

<http://proquest.safaribooksonline.com/?unicode=telemark>



<http://proquest.safaribooksonline.com/book/software-engineering-and-development/9781449691998?bookview=overview>

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