Software Development Life Cycle

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Software Development Life Cycle:

Traditional Models:

Spiral Model:
- Planning
- Risk Analysis
- Engineering
- Evaluation

Iterations in Spiral Model:
- Iteration 1: Prototype
- Iteration 2: Release Candidate
- Iteration 3: Product Launch

Rational unified process Cycle:
- Inception - Objective Milestone - 1 Iteration
- Elaboration - Architecture Milestone - 2 Iteration
- Construction - Initial Operational Capability Milestone - 3 Iteration
- Transition - Production Release Milestone - 2 Iteration

Dynamic Systems Development Method(DSDM)
Crystal Method

Modern Approaches:

Scrum:
- 1995
- Roles: Product Owner, Scrum Master and Development Team

Scrum roles:
- Scrum Master:
    - Agile Coach
    - Servant Leader
    - Convince not Manage
    - Removes barriers

- Product Backlog, Sprint Backlog and Product Increment.

Sprint Workflow:
- Sprint Planning - Product Backlog - Product Owner
- Sprint - Sprint backlog - Development team & Scrum Master
- Review
- Retrospective - Increment

- Flow:
    - Product backlog -> Sprint Backlog -> Daily Scrum Meeting -> Increment.

Lean Software Development:
- 2003
- Used by delivery teams such as amazon, insurance companies.
- Lean Value Stream Mapping:
    - Lead Time: Total Time taken from customer request to delivery.
    - Cycle Time: Actual time spent working on the item.
- Main Principle: Eliminate Waste

Kanban:
- Visualize your work and Limit work in progress.
- Little's Law:
  - **No. of items in work queue = Average time spent on each work item x Arrival rate of work items.**

Extreme Programming (XP):
- 1991
- Process:
  - Just-in-time design
    - Pair Programming - Collaboration - Two people working together.
    - Test Driven Development
      - Write Test for the code not written
      - Write function to fail test - as code is partially developed.
      - Write code to pass test - Exhaust till all scenarios are developed.

Spotify Model:
- Release Approach:
  - Squad works in parallel
  - Small frequent releases
  - Release train and feature toggle
- CI: Kata Board
- Squads - 1-7 people.
- Tribes: Group of Squads working in specific area.
- Chapter: Group of Squads working in specific expertise.
- Guilds: Group of Squads with similar interest.

DevOps:
Development and Operations.

CMMI:
- Capability Maturity Model Integration
- It is a Model not a Standard
- General guidelines
- Levels 1 to 5
- 1-Initial, 2-Managed, 3-Defined, 4-Measured and controlled, 5-Stable & Flexible
- CMMI V2.0-> Supports Agile scaling guidelines

Six Sigma:
- Scientific Method
- Reduce defect and variation
- Sigma -> Standard Deviation
- Sigma -> 1 to 6 Variations -> Higher sigma level is better, it means lesser number of defects.
- **DMAIC Cycle - Define (Value stream Mapping), Measure(Pareto Chart), Analyze(fish bone diagram), Improvement(Affinity Diagram) and Control(Control Charts)**
- Steven Browns - Lean six sigma process.

Reference:
- **Linkedin**