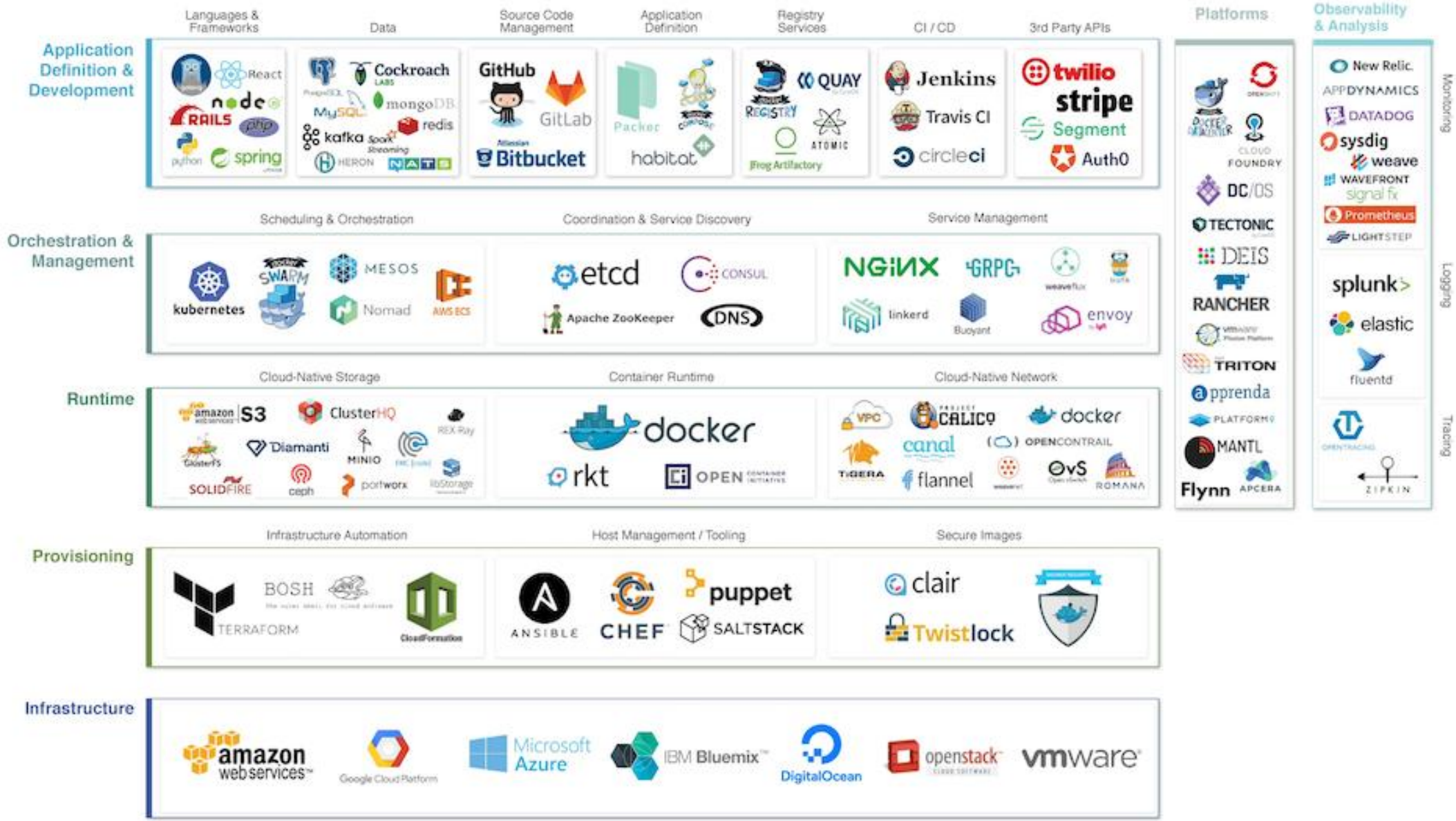
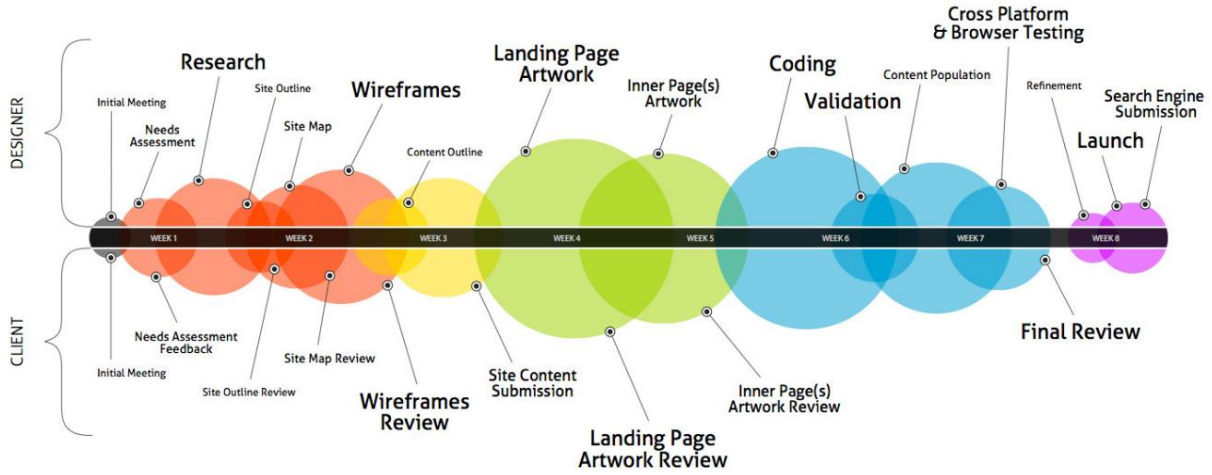
CA6C1 - DevOps

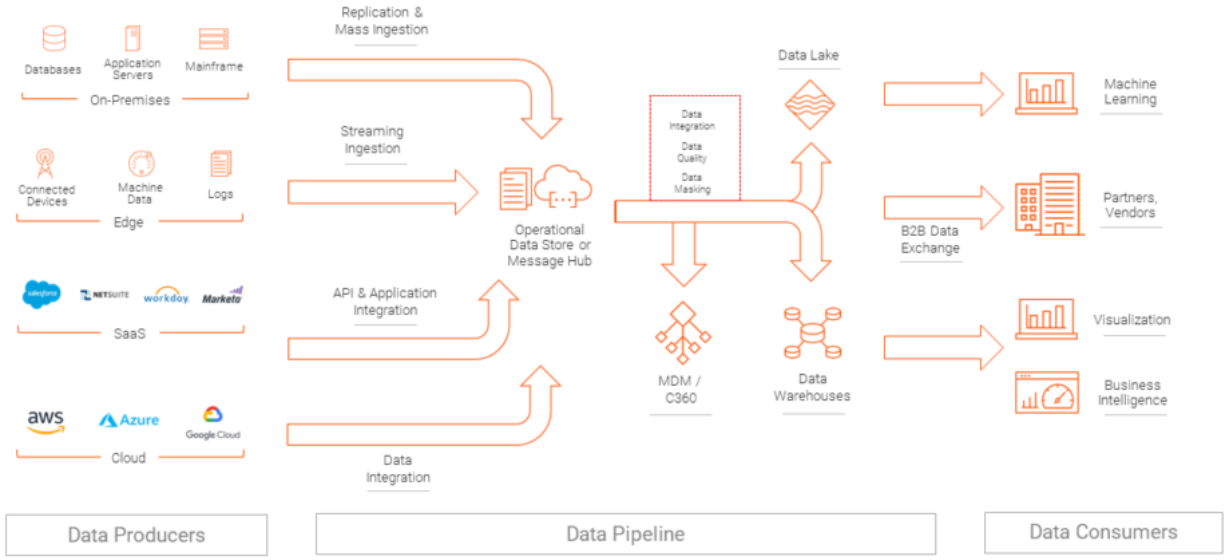
https://sai11101989.github.io/ca6c1devops_spring2025.html

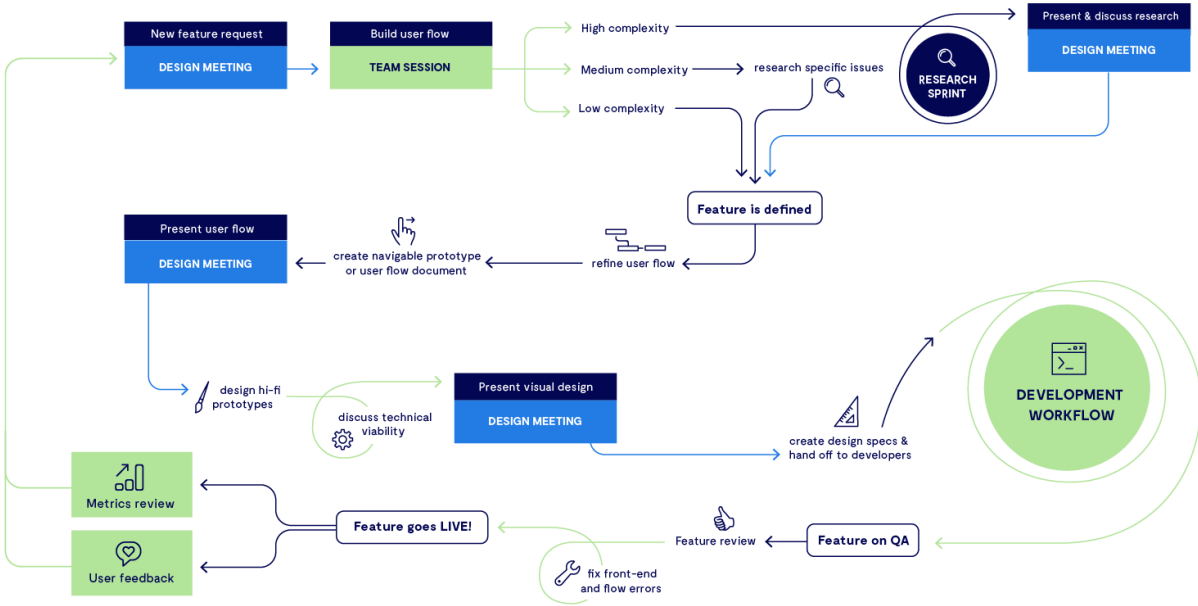
What is DevOps?



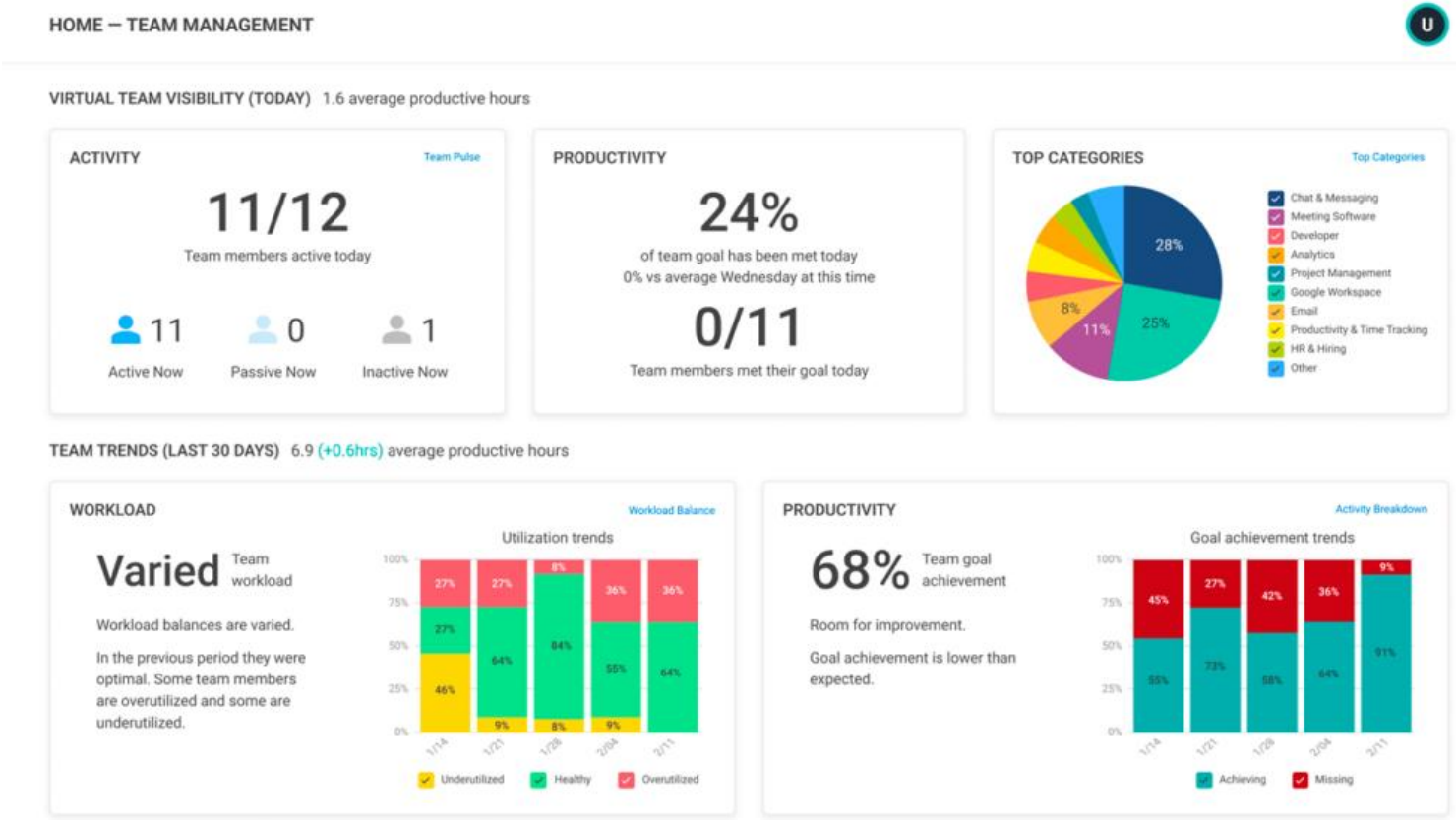
How is it executed? Software Production

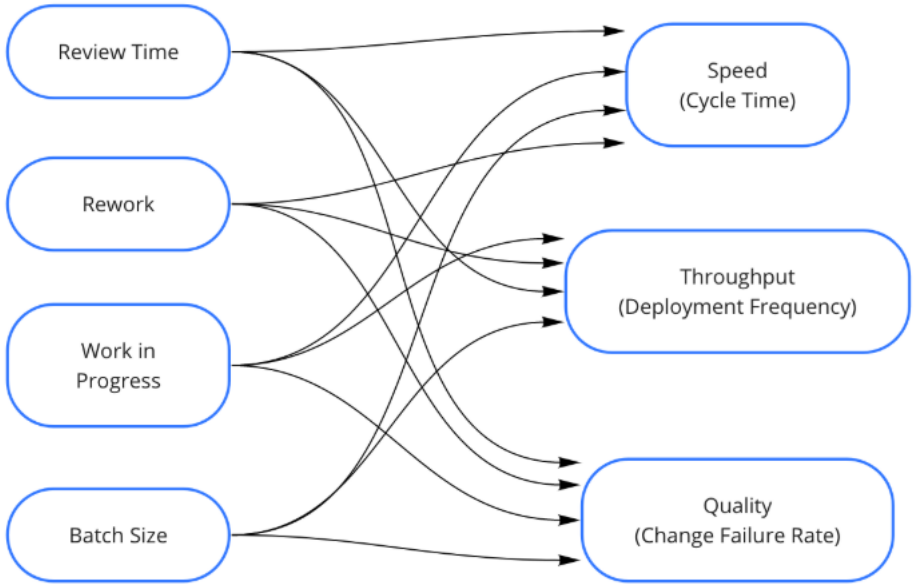






Impact?


HOME – TEAM MANAGEMENT
VIRTUAL TEAM VISIBILITY (TODAY) 1.6 average productive hours
ACTIVITY
Team Pulse
11/12
Team members active today
11
Active Now
0
Passive Now
1
Inactive Now
PRODUCTIVITY
24%
of team goal has been met today
0% vs average Wednesday at this time
0/11
Team members met their goal today
TOP CATEGORIES
Top Categories
28%
25%
11%
8%
Chat & Messaging
Meeting Software
Developer
Analytics
Project Management
Google Workspace
Email
Productivity & Time Tracking
HR & Hiring
Other
TEAM TRENDS (LAST 30 DAYS) 6.9 (+0.6hrs) average productive hours
WORKLOAD
Workload Balance
Varied
Team workload
Workload balances are varied.
In the previous period they were optimal. Some team members are overutilized and some are underutilized.
Utilization trends
Underutilized
Healthy
Overutilized
PRODUCTIVITY
Activity Breakdown
68%
Team goal achievement
Room for improvement.
Goal achievement is lower than expected.
Goal achievement trends
Achieving
Missing


Review Time
Rework
Work in Progress
Batch Size
Speed (Cycle Time)
Throughput (Deployment Frequency)
Quality (Change Failure Rate)

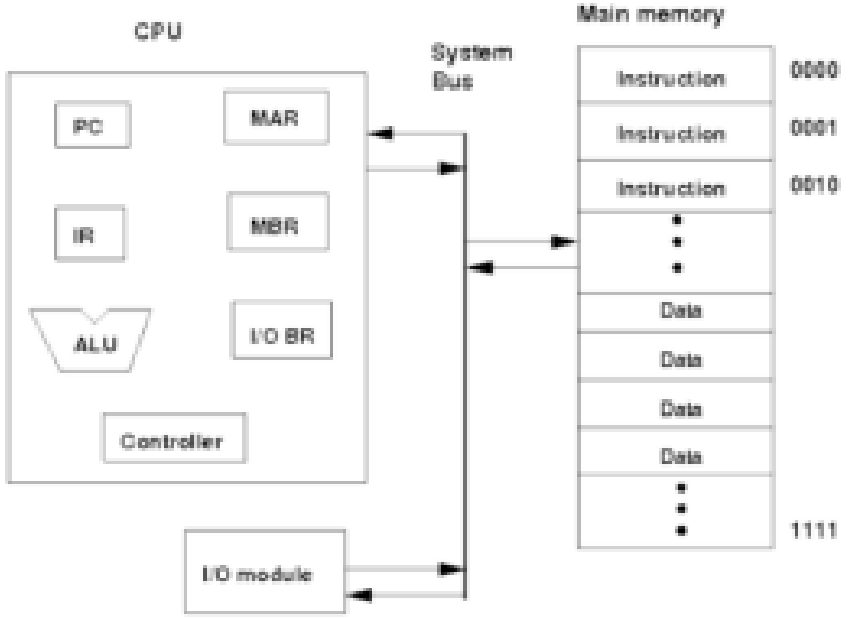
Course Outcomes!

Concepts associated with OS – BASH Scripting
Version Control using GIT
Understand Software Engineering Teams
Software Metrics
CAMS Model
CI/CD Approach for Software Production
Platform as Service and Orchestration
DevOps Engineer – Real world Use-cases
MLOps and DevSecOps

HARDWARE

Requirements of Basic Computing Device

- Input & Output Unit
- Memory Unit {primary, secondary}
- Processing Unit – {ALU, CU, Registers}
- Interconnection Structures – {control, address & data buses}

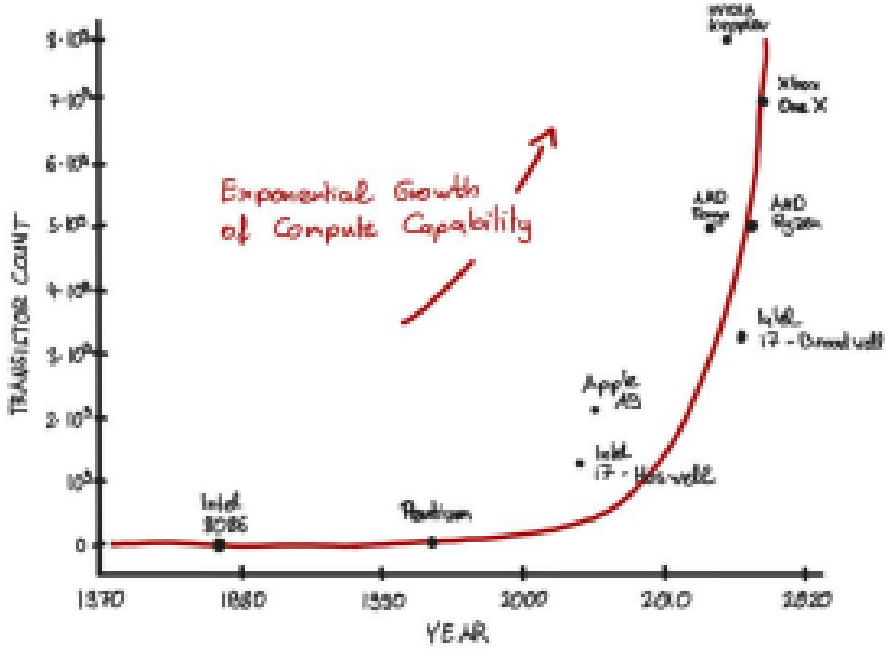


Ingredients of a Better Computation Power

- Organization of Hardware
- Mode of Processing
- Data Storage
- Processing Speed
- Complexity
- Control Mechanism
- Resilience

[MOORE'S LAW]
An observation that the number of transistors on a microchip roughly doubles every two years, whereas its cost is halved over the same timeframe

Gordon Moore (1929-2023)



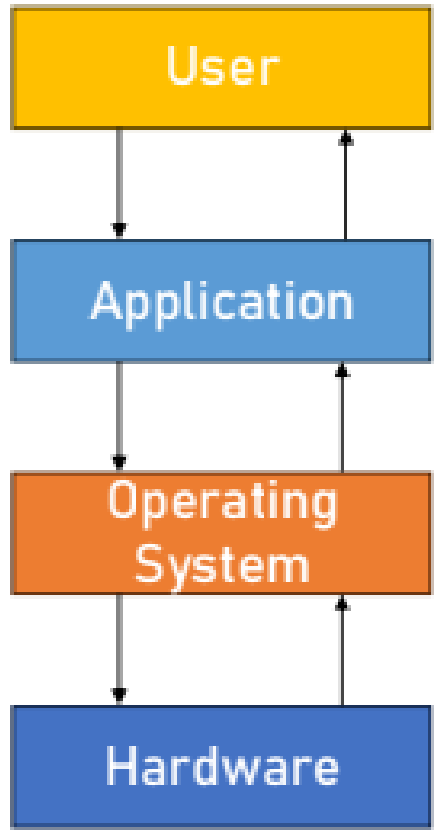
SOFTWARE

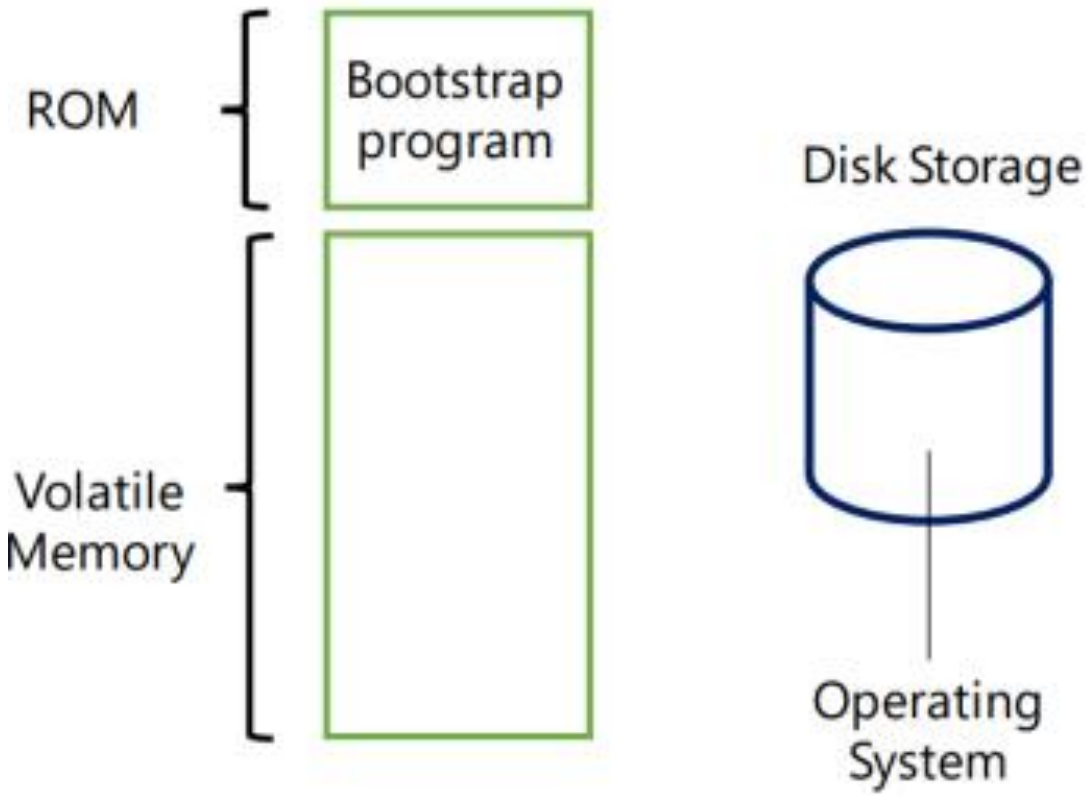
Software – A set of programs, procedures, algorithms and its documentation. It is written using programming languages

- *High-Level Languages* – e.g. C, C++, Java etc.
- *Assembly Language* – mnemonic-based e.g. ADD, SUB, MOV
- *Low-Level Language* – native language of computer circuitry

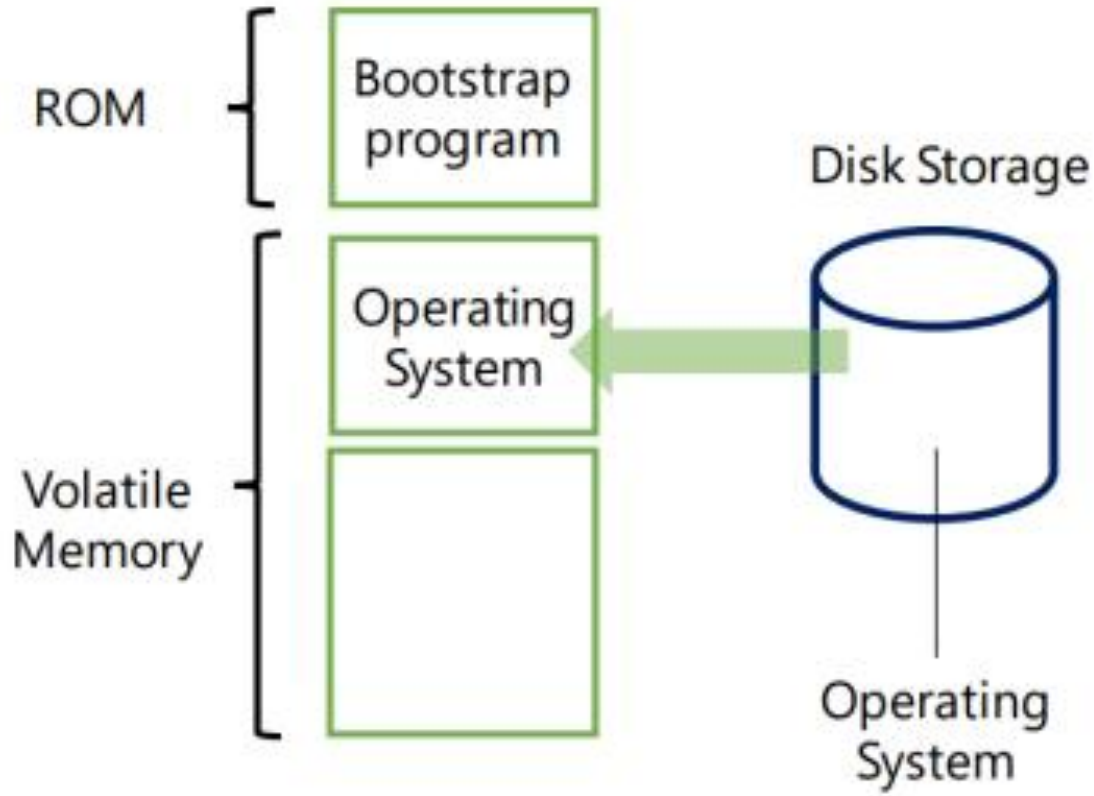
Language – has Syntactic + Semantic rules, otherwise called as Syntax, logical and/or runtime errors

Types – Complied Languages Vs Interpreted Languages Usage – Application Software Vs System Software

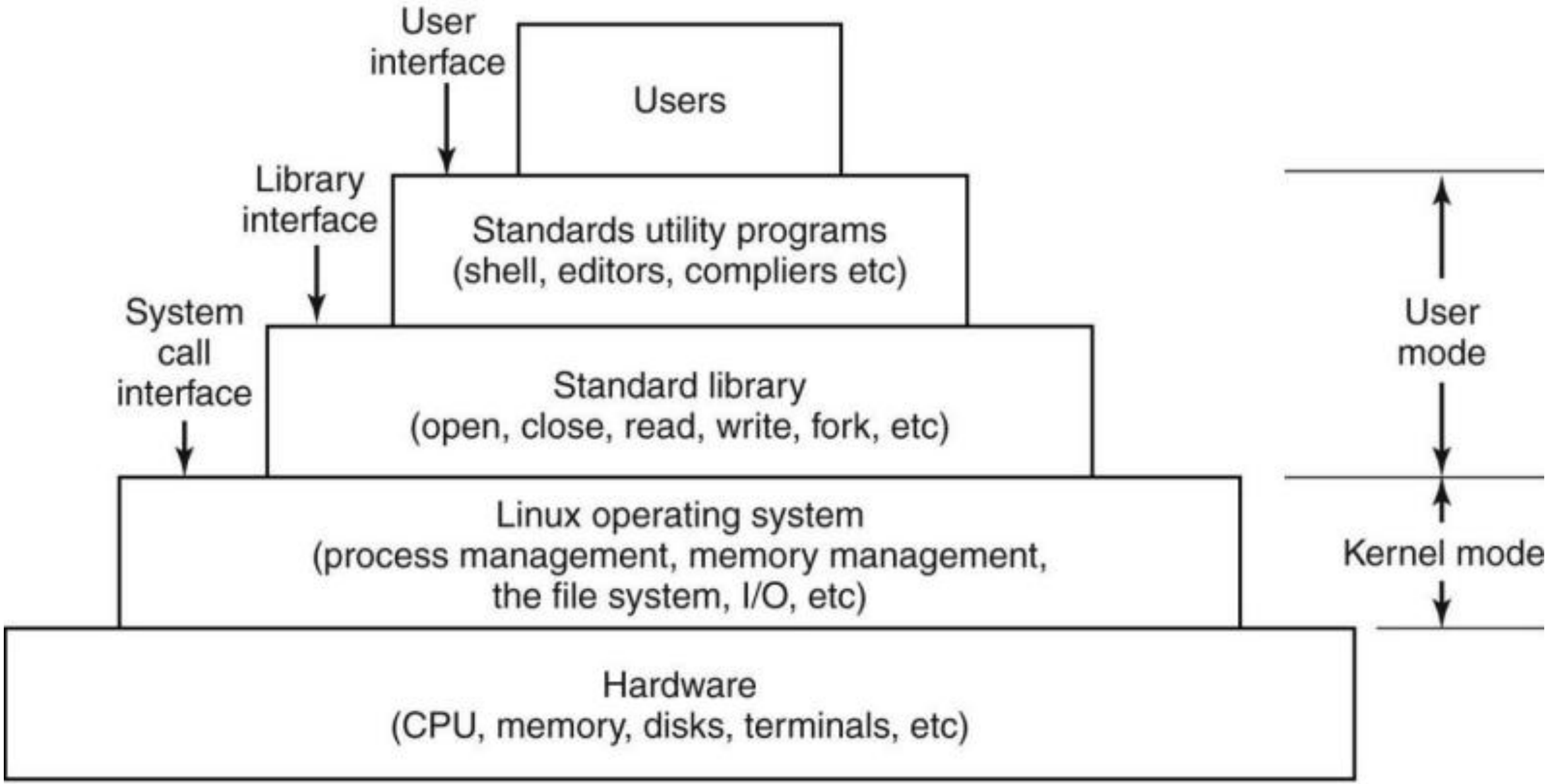




Step 1 – Machine starts by executing the bootstrap program already in ROM. Operating System is stored in Mass Storage (Disk Storage)



Step 2 – Bootstrap program directs the transfer of the operating system into main memory and then transfers control to it


User interface
Users
Library interface
Standards utility programs (shell, editors, compliers etc)
System call interface
Standard library (open, close, read, write, fork, etc)
Linux operating system (process management, memory management, the file system, I/O, etc)
Hardware (CPU, memory, disks, terminals, etc)
User mode
Kernel mode

SHELL - A program (a.k.a. command-line interpreter) that allows the user to interact with the UNIX/Linux system. https://ss64.com/bash/

Examples: Bourne shell (sh), Bourne again shell (Bash), C shell (csh, tcsh), Korn shell (ksh), Powershell (windows)