SOFTWARE ENGENEERING

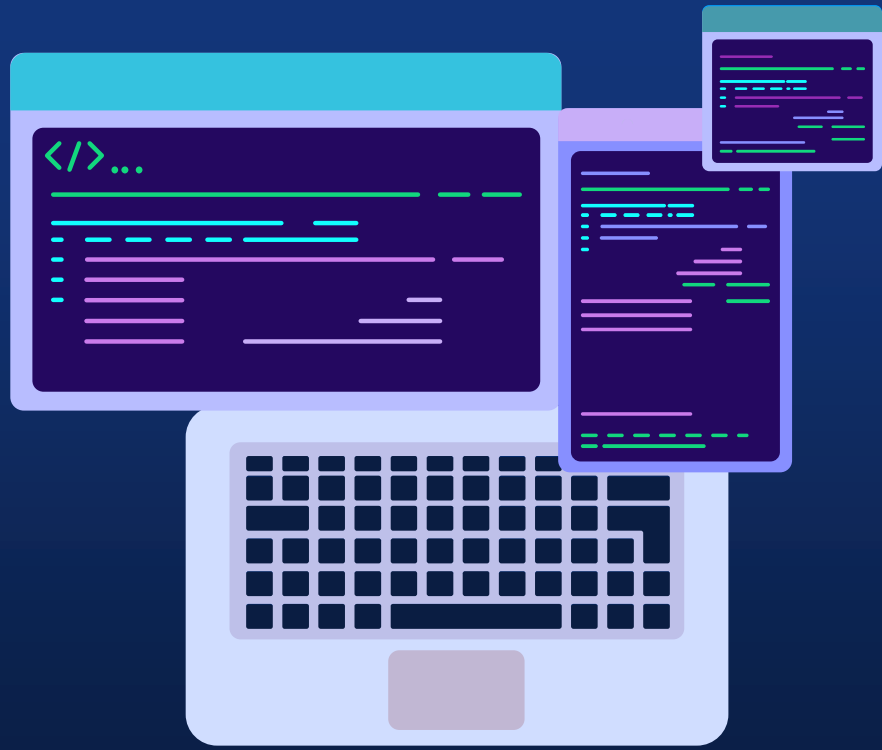

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TABLE OF CONTENTS

01

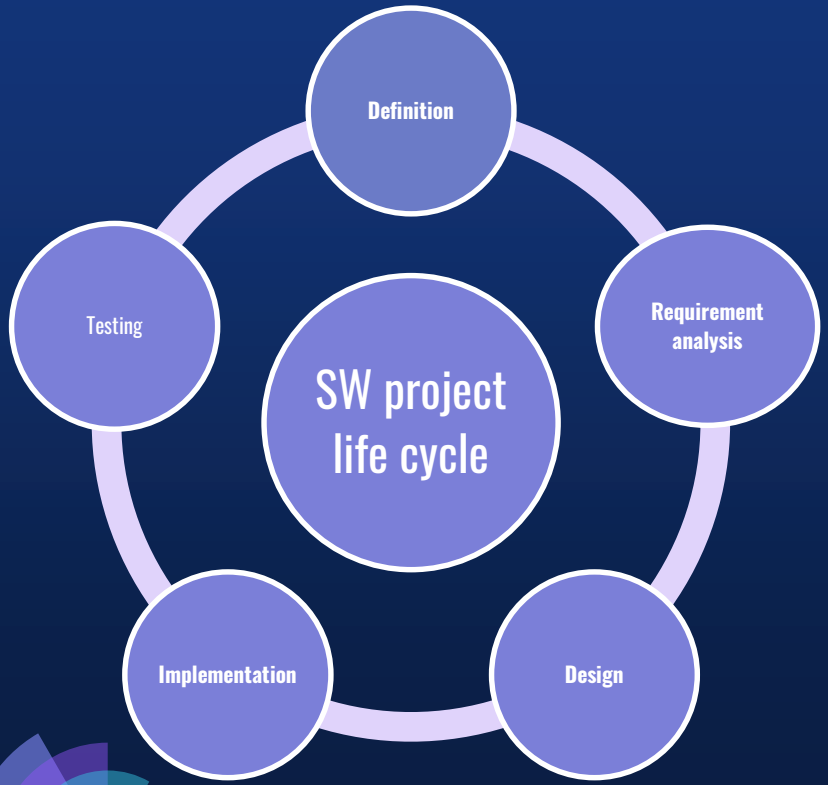
Intro to SW engineering

Intro to SW engineering (what it is, and why to use)

- **Software engineering** is defined as a process of analyzing user requirements and then designing, building, and testing software application which will satisfy those requirements.

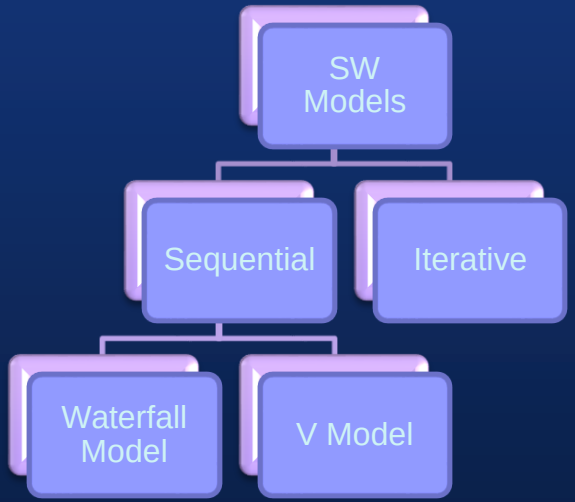
- **SW engineering** helps with :
  - Large software
  - Scalability
  - Adaptability
  - Cost
  - Quality Management

Intro to SW engineering (life cycle)

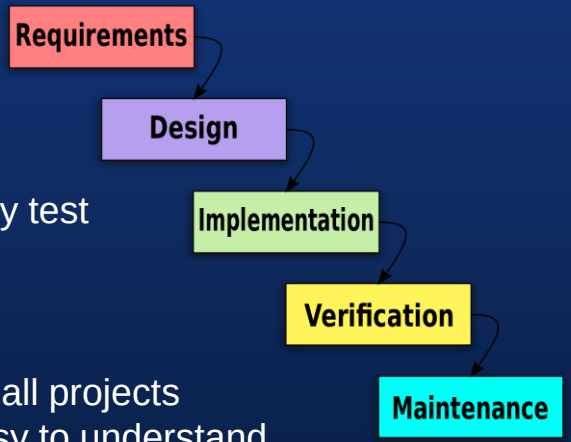


Phase	Role	Generated docs
Definition	Product owner / REQ engineer / Business analyst	CRS
Requirement analysis	System engineer	HSI, SRS
Design	SW Architect (HLD), SW Engineer (LLD)	GDD, CDD
implementation	Developer	
Testing	Developer (white box) , Tester (black box)	UTD, VTD

Intro to SW engineering (Models)



Waterfall Model



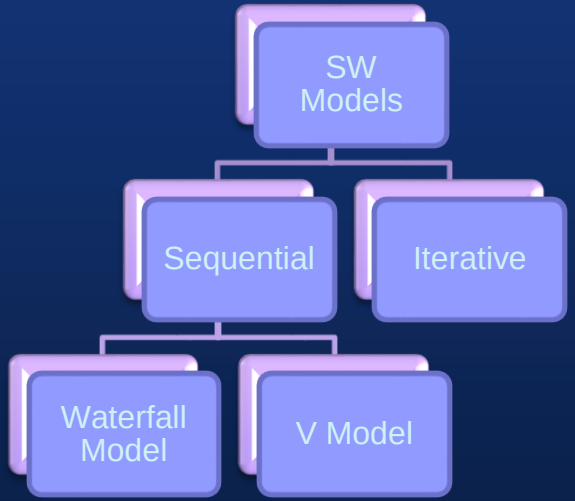
Cons :

- Not flexible
- There's no early test

Pros :

- Suitable for small projects
- Simple and easy to understand

Intro to SW engineering (Models)



V Model

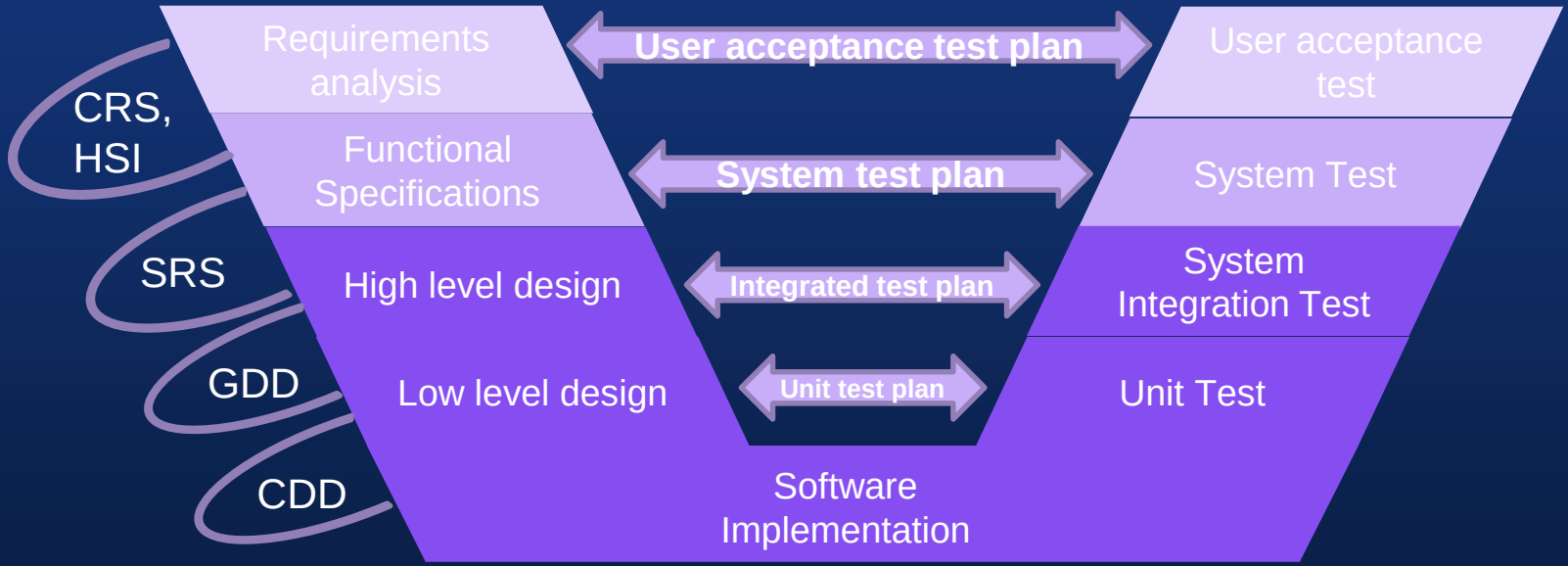
Cons :

- Complex for small and low risk projects
- A lot of intermediate layers

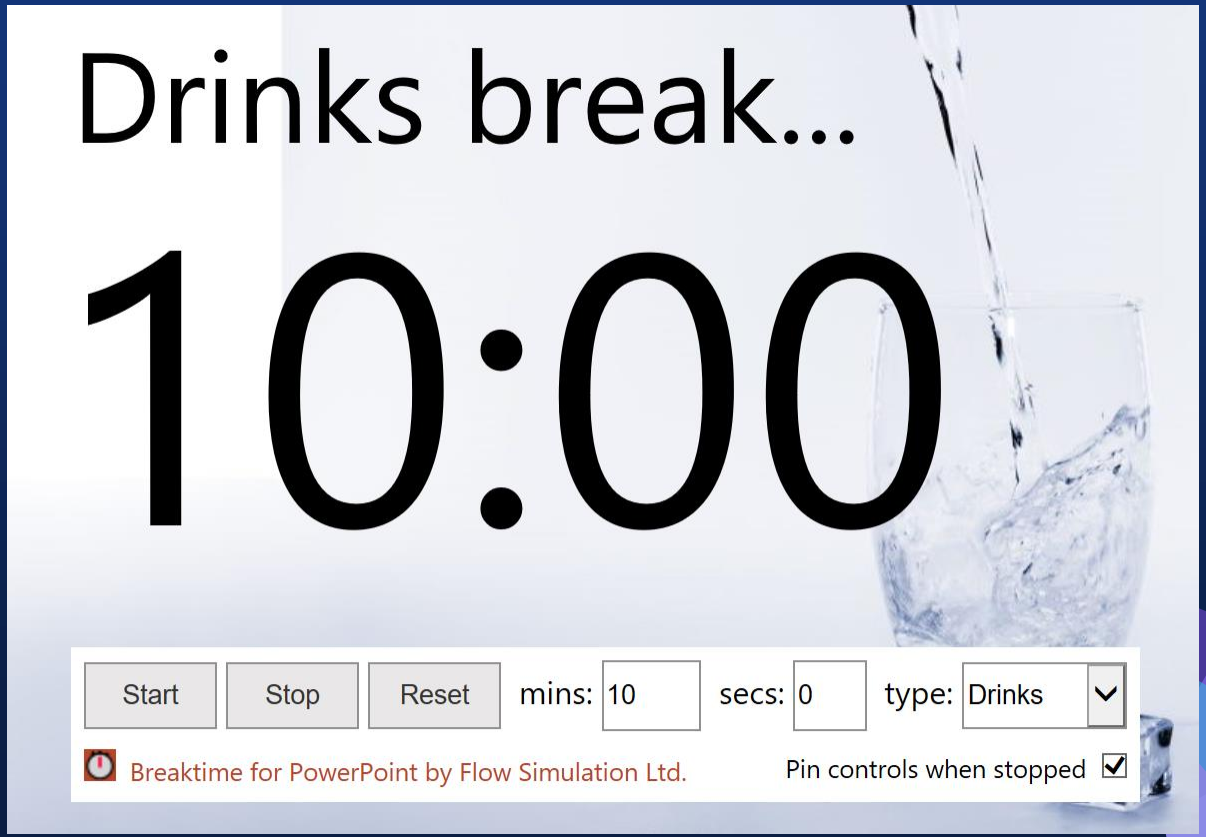
Pros :

- Early test
- Risk management
- Project is divided into atomic parts

Intro to SW engineering (Models → V-Model Process)



Break 10 min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Breaktime for PowerPoint by Flow Simulation Ltd.
Pin controls when stopped

02

Applying V-model

Applying V-Model (CRS)

Requirement analysis

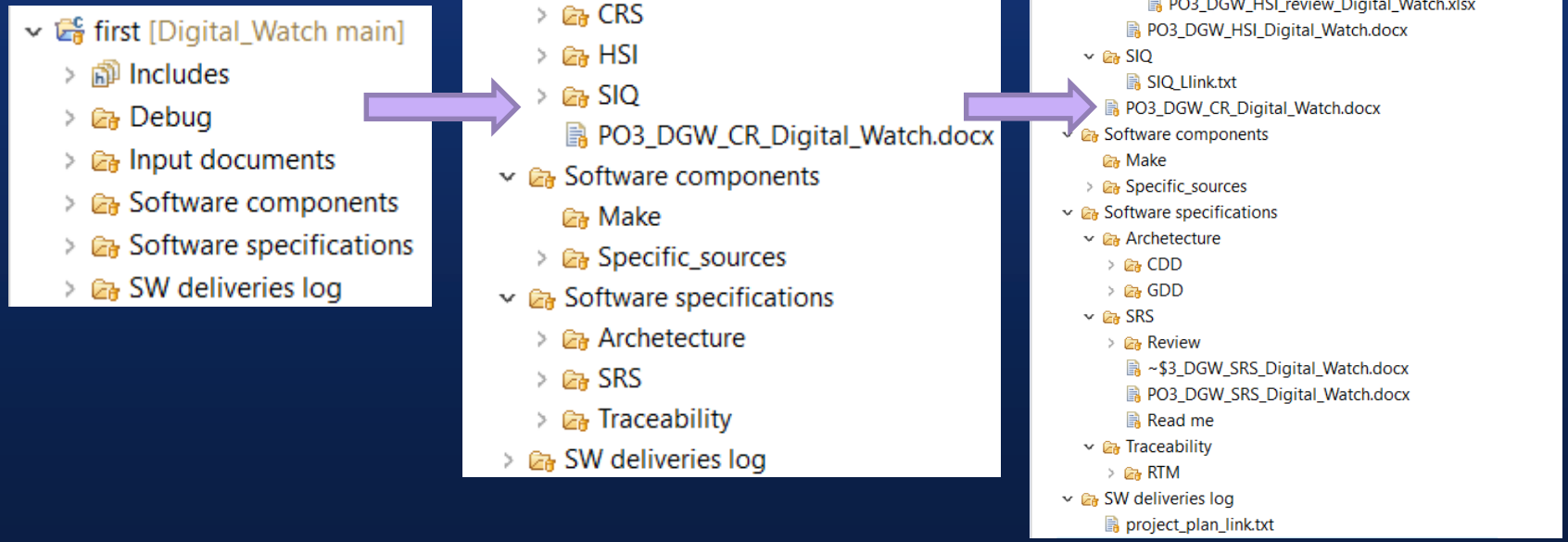
This is the first stage in the V-Model. Analyzing the requirements is the phase where the system engineers →

- Break down the customer requirements (CR) into system requirement and generate the CRS document
- Define which requirement to allocate to SW and which to HW. Then involve with HW team to initiate HIS document.
- Define the overall system context.

Applying V-Model (Document structure)

- Document naming convention
- Table of content
- Document status
  - Status :
    - Draft : document is under processing and not ready to review
    - Proposed : document is ready for review
    - Released : Reviewed and No more open review points
  - Structure : table has Status , Version , Date and Author
- Document history
  - Structure : Table has version, Date, change author and change details.
- Reference documents
  - Structure: table has Ref.Name, Doc.name, version and status

Applying V-Model (File structure)



Applying V-Model (Before we start, prepare the CR)

Graduation project Idea

- Choosing idea
- Analyze the idea
- Match team members skills with what the idea requires
- Define the current features and future work
- Related work and market

Prepare your Inputs

- Prepare your customer requirement based on the features your team agreed on.
- Map each feature to a covers name following the naming convention we agreed on

Applying V-Model (CRS, HSI, RTM, Review sheets, and week plan)

CRS
(customer requirements specification)

HSI
(customer requirements specification)

RTM
(Requirement Traceability Matrix)

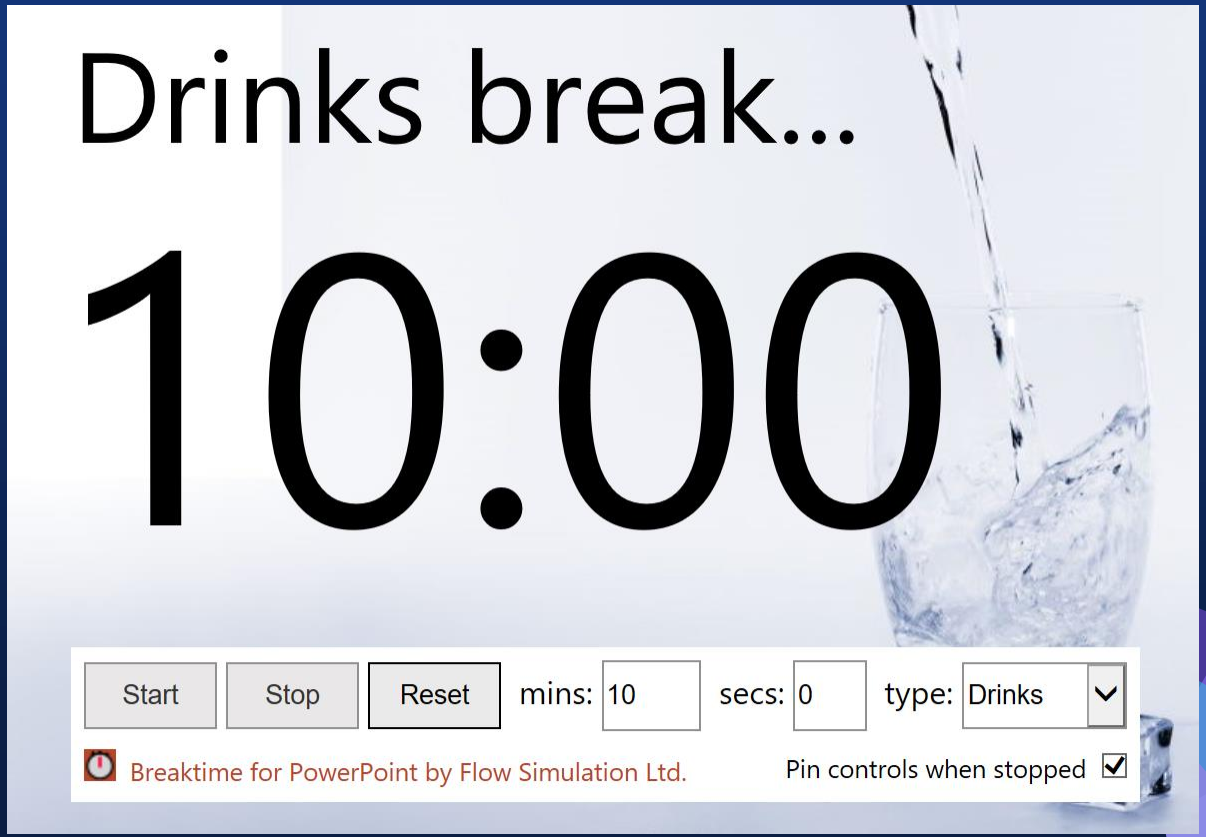
Review sheets

Week Plan

RESOURCES

- Omar, A. (n.d.). *Software engineering*. *ITI 9-month Diploma, Embedded software track*. 6th of October; ITI smart Village.
- Martin, M. (n.d.). What is Software Engineering? Definition, Basics, Characteristics. https://www.guru99.com/what-is-software-engineering.html#2.
- Structured methodology review. (2002). *Software Engineering Handbook*, 151–160. https://doi.org/10.1201/9781420031416-16.
- Ruparelia, N. B. (2010). Software development lifecycle models. *ACM SIGSOFT Software Engineering Notes*, *35*(3), 8–13. https://doi.org/10.1145/1764810.1764814

Break 10 min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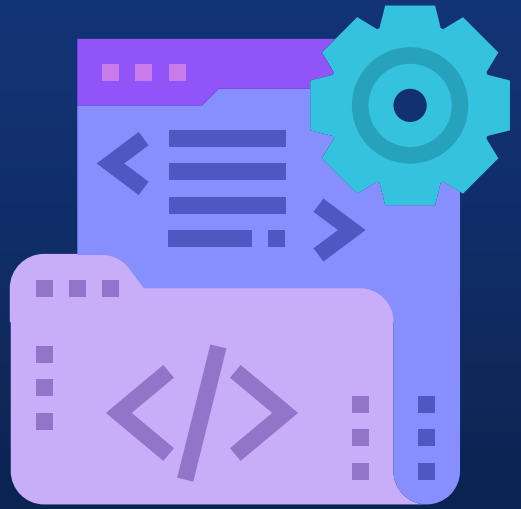
03

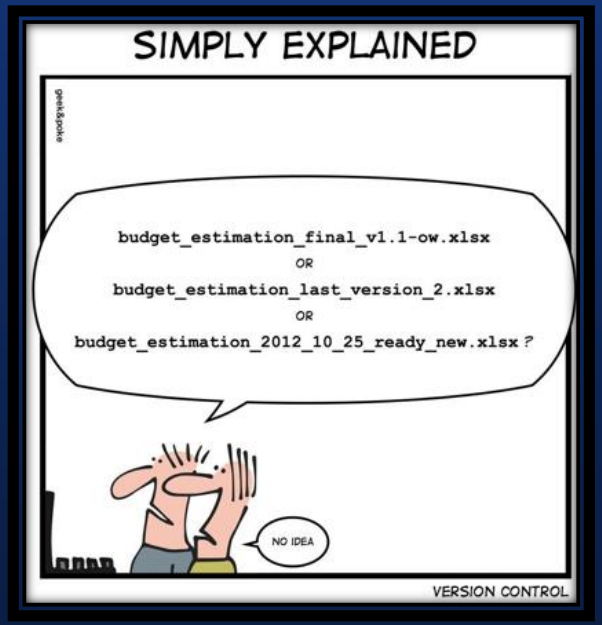
Version control



Version control

Do you have documents like that ?!

Got lost in your versions !



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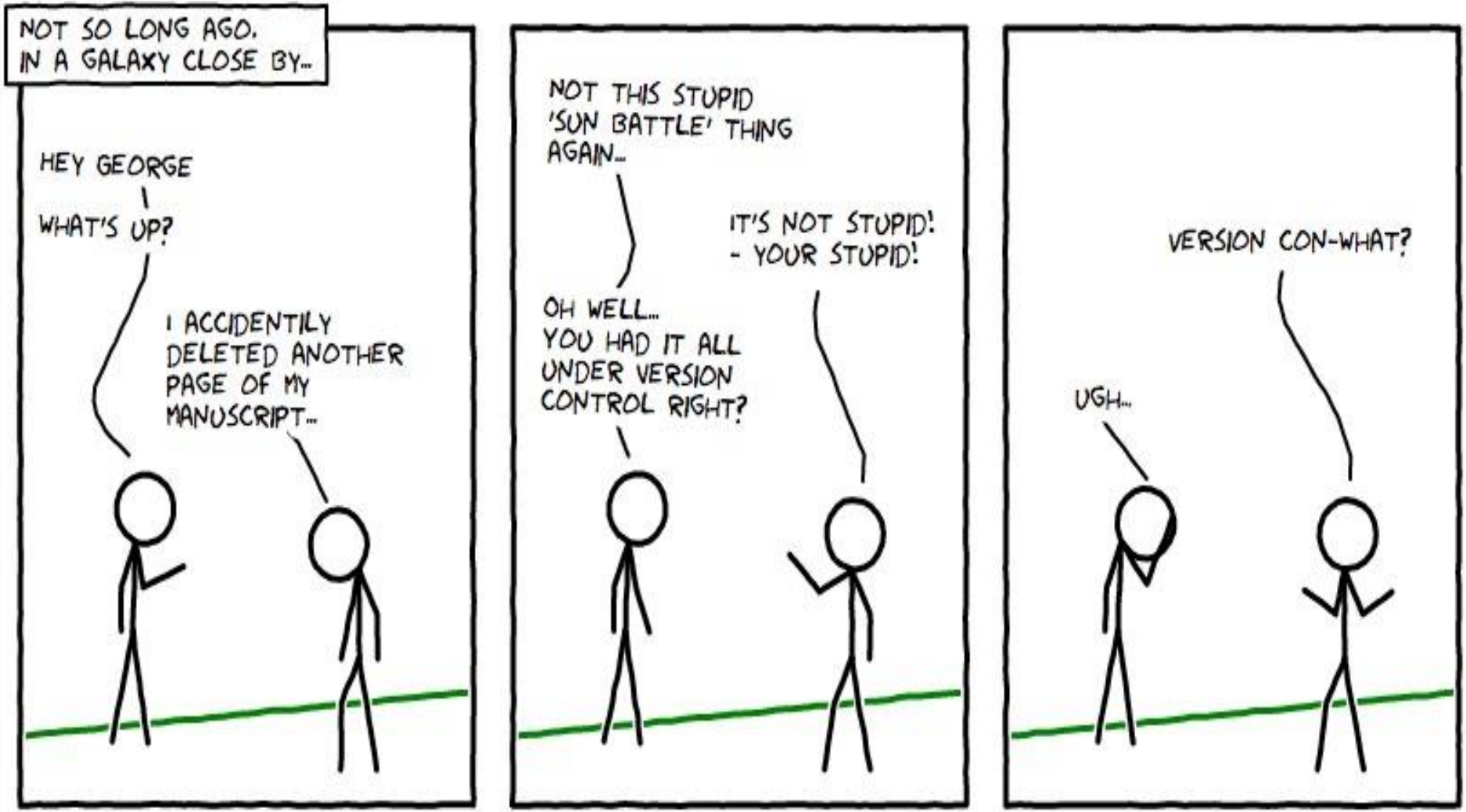
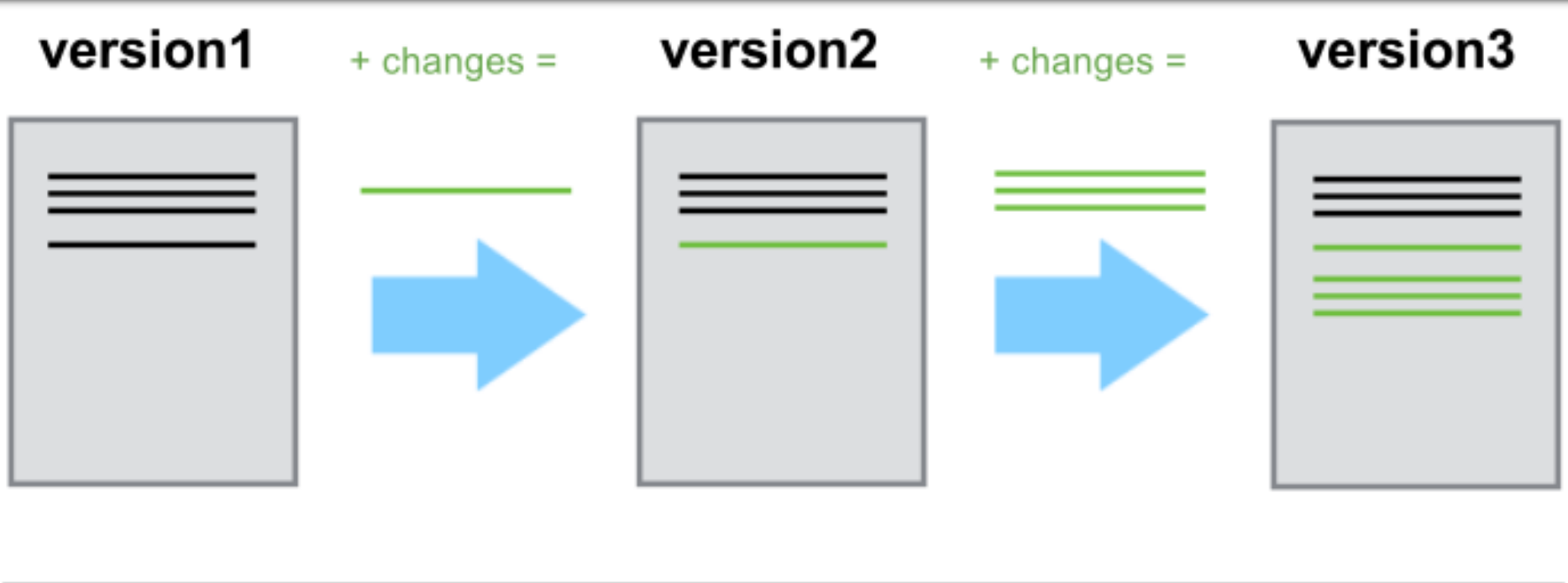
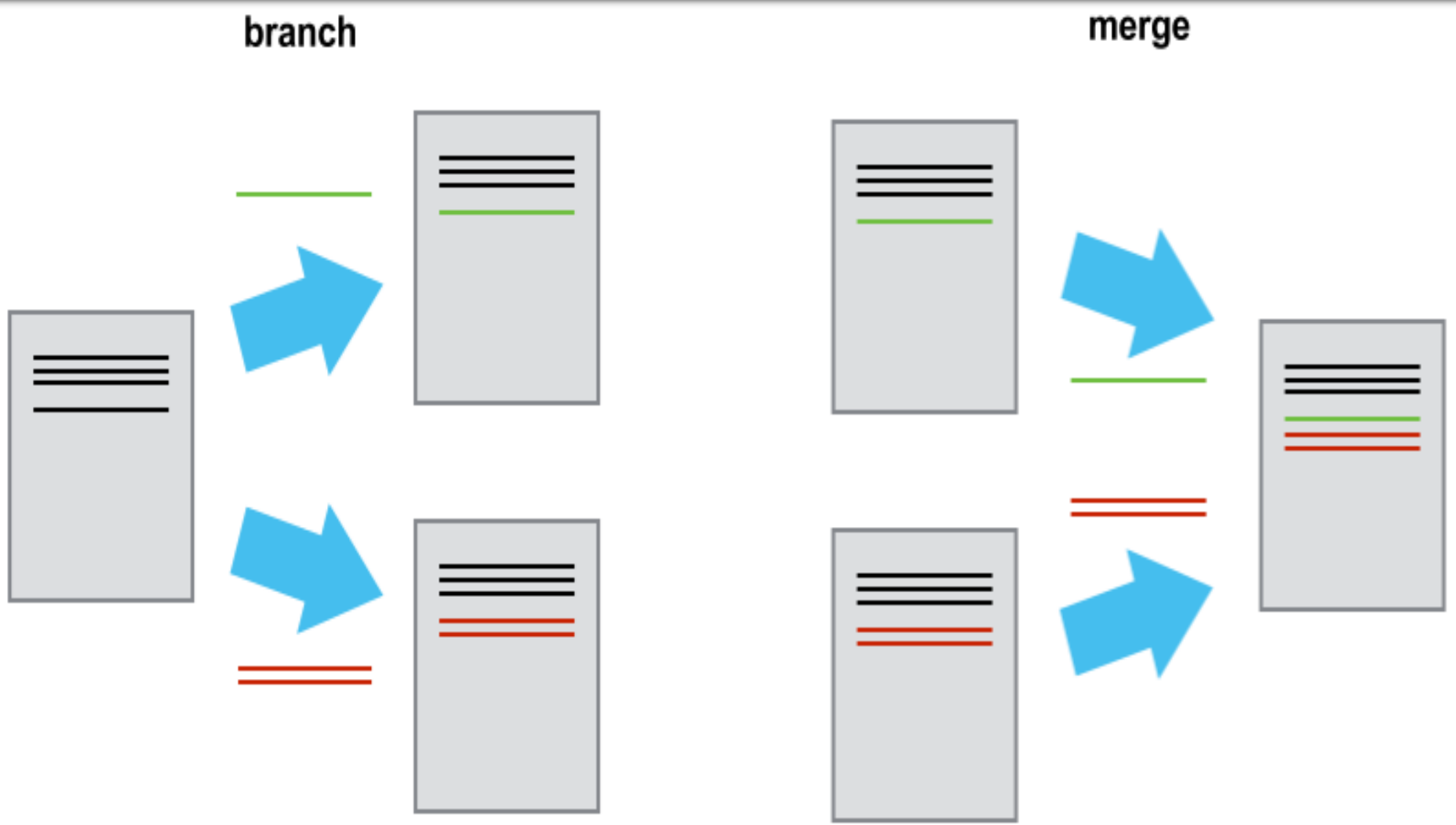

NOT SO LONG AGO. IN A GALAXY CLOSE BY...
HEY GEORGE
WHAT'S UP?
I ACCIDENTILY DELETED ANOTHER PAGE OF MY MANUSCRIPT...
NOT THIS STUPID 'SUN BATTLE' THING AGAIN...
IT'S NOT STUPID! - YOUR STUPID!
OH WELL... YOU HAD IT ALL UNDER VERSION CONTROL RIGHT?
VERSION CON-WHAT?
UGH...


version1
+ changes =
version2
+ changes =
version3


document.txt
.git


branch
merge

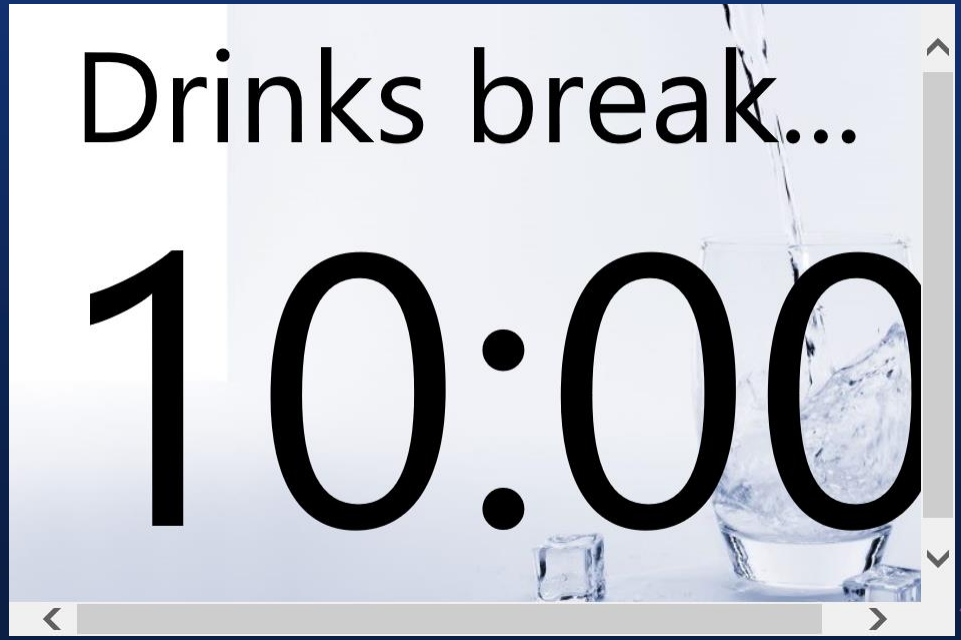
RESOURCES

- Git Extensions Documentation. (n.d.). https://buildmedia.readthedocs.org/media/pdf/git-extensions-documentation/latest/git-extensions-documentation.pdf.
- What is version control? (n.d.). *Bitbucket*. https://www.atlassian.com/git/tutorials/what-is-version-control.
- What is Version Control? (n.d.). https://uidaholib.github.io/get-git/1why.html.

04

Project Documentation

Break 10 min



05

Tools

Tools

MS Project

- Planning
- Manage resources

MS visio

Building Diagrams

MS Excel sheets

Review sheets

GIT extention

Manage repositories

Google sheets

SIQ

06

Tasks

Tasks

Task 1	Create GitHub repo with the same files structure we agreed on and add me as collaborator.
Task 2	Week plan using MS project (with handling resources)
Task 3	Create CRS Document
Task 4	CRS Review Sheet

Tasks

Task 5	RTM
Task 6	SIQ Sheet using Google sheets
Task 7	Project Book Table of content
Task 8	Book Acknowledgement, Abstract, Purpose of Documentation, and Chapter 1

Notes

Deadline

The deadline will always be Wednesday 11:59 PM so that I can do the review on Thursday before our session
And please don’t just repeat words , understand what you are adding before you write it down in the document.

Repo

Only team leader can Merge branches with the master brach and pushing on master have to be only after successful integration

Communication

You can always contact me through the team leader and vise versa. Or you can email me directly

Meeting / Session

We will meet every Friday at 9 PM.

THANKS

Please keep this slide for attribution