Software Engineering

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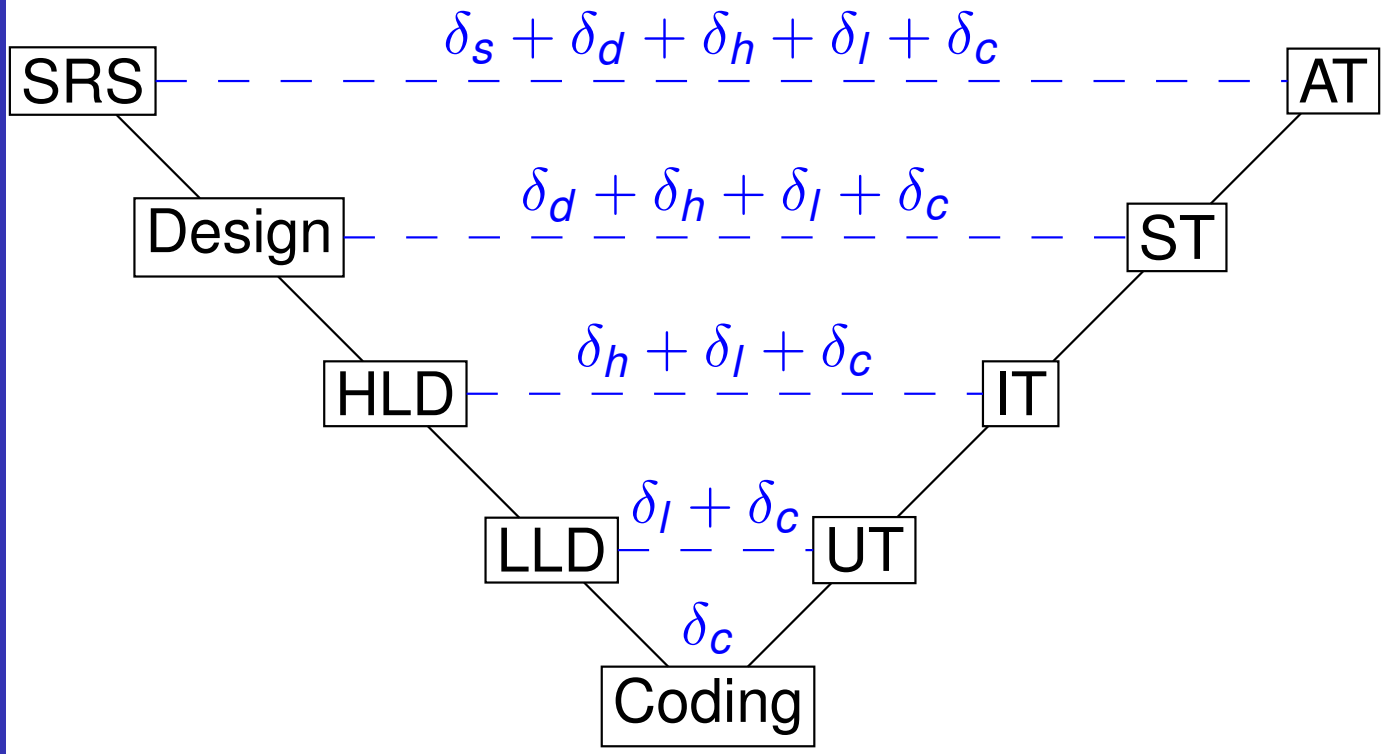
Assumptions

- Development is a sequential model
- Every phase is connected to each other
- Flaw at any stage means updating to referring stages



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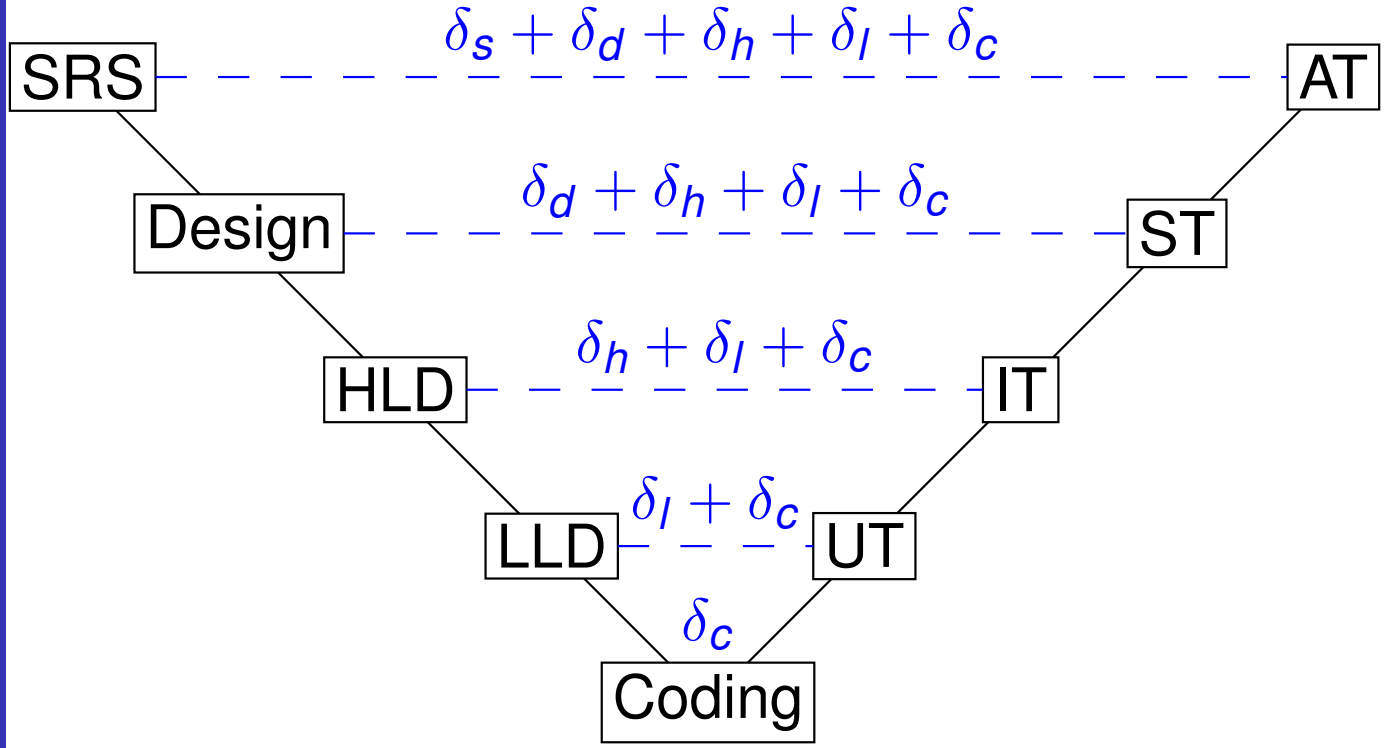

$\delta_x \longleftarrow$ *is the change Factor*

- Based on assumption that ϕ has perfect output and is complete
- Failure at any stage, means referring back to previous ϕ's
- Bug detection means cycling through the ϕ's(δ factor)

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Eventually the Quality suffers

- Frustration of newer staff and Maintenance problem

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- The team members understand the adopted practices
- Client dictates the way we proceed
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Don't change the model,Just automate it

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College student with half the skill provides a solution

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To be more competitive

- Product has to have more features(Cost for Money)
- Questions on the product sanity and performance begins to arise
- Marketing team works harder to sell
- Designer work overtime to make the product look good
- Enforcement of heavy deadline

- Developer works harder
- Problem in updating the documents and keeping its sanity
- Coping up with the frustrations of overworked developer, Marketing people.
- Answering to the management about missing deadline
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How can this college student cause this much confusion?

- Self Motivated (No money is being charged)
- Well studied and build his software based on ideology from some Journal
- Gets good backing from the University's

Tasks of Independent Developer

- Maintaining at-least 3 New groups List or more: developer/user/announcement
- Updating the code and its patches as discussed in the developer list
- Updating FAQ, User Manual, Design docs etc. . .
- Monitoring the security of the site
- Plus a part time job, studies, attending conferences etc. . .
- and more. . .

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Output is the same, except that its more effective. . .

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Adopting

- Why not adopt their design methods also?
- We have nothing to lose
- We get the advantage to understanding their model and code better?

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4. Give yourself time and decide where to put in efforts.
   Developing skills and gaining knowledge is more important

Consider every piece of software you develop has already been done

- You got no new ideas
- You don't understand Open Source model

Result of Understanding of Open-Source Model

- Understanding of Open Source model
- Modification of Open Sources
- Doing things the way Open source does it, which is the faster way
- Meeting the deadlines

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Facts

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Any other design document is not a design, e.g for reimplementation of a RFC, RFC is the design whose proof of concept has already been provided by the RFC author.

- Know the subject throughly
- What are the open Sources available
- From the SRS gather what is the primary target
- Assume that the SRS is going to change and is incomplete. (In most cases it is anyway)
- Get the framework ready (Secondary Targets)

  `This is the area where I will be concentrating my efforts`

Outcome from the Design Phase:

- Organization of the Sources
- User Manual and Install Manual framework
- All the additional libraries and packaging
- Test case plan infrastructure

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Exceptions

User Manual and code Documentation can be generated from the code, which makes maintainability easy.

- Study/Understand a open source code, its coding conventions and techniques.
- Use Macros & Compiler features as much as possible.
  E.g : It is not enough to know K&R. Use must be able to use compiler features
- For portability try different environment
  e.g For Open-Source development, machine type is not an issue as they have Compile farms available
  So we should be better off then some open-source person using P-I machine with 64 MB Ram or less, being able to develop portable code across all the platforms.

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- Try to automate any thing and everything even if its manual e.g If manual testing is the only way then get as much automation done a possible.
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Facts

- Testing is not QA activity.
- Its a Misconception that testing improves the Quality of the product.
- Testing is a validation process.
- Testing is the only way to increase your domain knowledge
- Testing provides insight into the compiler, tools etc. . .

- Everybody knows and accepts documentation is important and many of us have been a part of it.
- How many of us have produced Man pages, Info pages, HTML help, Windows help. . . ?
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We are used to producing WYSIWYG documentation based on M$ WORD but even M$ also does not provide help using Word

`The problem is it does not merge well with Software Development`

Why change it?

- Because there is no way to automate it...(in case a change is required)
- Because there are distributed as word doc, and cannot be rendered into other forms like pdf, HTML, info
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Notice how FAQ are maintained, you can get them either as PDF, PS, RTF, HTML

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  If properly configured with Graph-Wiz, it can produce graphical diagrams.
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- A change in the way we use the documentation can speed up our work by 30%-40% at-least and that too will keep every thing in sync . . .

Make utility

This utility is perhaps the core to every development cycle, and should be freezed during the design phase itself.
You can use this utility to achieve full automation right from the producing
Design Documents $\rightarrow$ Coding $\rightarrow$ Testing $\rightarrow$ Results $\rightarrow$ User Manual creation $\rightarrow$ Packaging

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Accessories

There are accessories to make, which can be classified as `Autoconf, Automake` This is just a set of m4 macros which you can use to configure you code for portability.

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  Advantage:
  - Integrates well with Automake utility
  - Can be used to test any testing from Batch, Interactive, GUI testing.
  - GCC used it, GDB uses it
  - Learning to use Deja-Gnu will give you insight into the working of GCC, GCJ, GDB. . . glibc uses Perl
  - Can be used to test remote configuration

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2.

For Open-Source

Understand the Secondary before the Primary target

3.