February 6, 2013

Integrated Campus

SDLC Model

Group 2

INTEGRATED CAMPUS | SEN-Winter 2013

Revision History:

Version	Primary Author(s)	Description of Version	Reviewed By	Date Completed
1.0	Vipul Garg	1st SDLC model	Jayesh Hathila	6th Feb 2013

Models:

1. Classical/Iterative Waterfall Model:

Merits:

- It is simple to implement and the amount of resources required for it are minimal.
- It is significantly better than the haphazard approach to develop software. It provides a template into which methods of analysis, design, coding, testing and maintenance can be placed.

Demerits:

- As the project team proceeds, changes in the previous phase for example requirement phase can cause confusion and will lead to do repeat the phases to accommodate the changes.
- The customer must have patience as a working version of program will not be available until late in the project time span.
- Problem of "Blocking states" i.e. some project team members must wait for other members of the team to complete dependent tasks.

2. Prototyping Model:

Merits:

- Very helpful when client is not very specific about his/her requirements.
- Provides a good mechanism for understanding the customer requirements.
- Helps client to visualize what he is going to get at the end.
- Facilitates critical examination of technical issues associated with software development.

- Reduces risk of failure as potential risks can be identified early and mitigation steps can be taken.

Demerits:

- It is often confused to be the original product.
- Prototype model is effective only if it's done in a quick manner of time so, sometimes building the prototype with the same rigour as the product, results in wastage of precious time.
- Compromises on the choices like operating system or programming language, are often made during prototyping.
- Should be done using minimal resources.

3. RAD Model:

Merits:

- High speed model which uses component based construction.
- Enables a development team to create a "fully functional system" within very short duration. Provided the requirements are well understood and project scope is constrained.
- It works to reuse existing program components or create reusable components (when required).

Demerits:

- It requires that requirements are "well understood" and the project scope is constrained.
- Requires sufficient human resources to create right number of RAD teams for large scalable projects.
- It requires equal level of commitment from developers and customers towards the rapid development process.
- Also it cannot be applied to projects which cannot be broken down in proper modules

4. Evolutionary Model - Incremental:

Merits:

- User gets an opportunity to experiment/use the partial system much before the fully developed version is released. Feedback from usage of the core product is used to modify the core product to better meet the needs of the customer.
- Helps in eliciting requirements clearly and thoroughly
- Core module gets tested very thoroughly (since it gets tested at the time of each release)
- Entire resource requirements need not be committed to the project at the same time
- Incremental delivery, however, provides a much more satisfying customer experience and helps in overcoming initial "loss of confidence"
- Useful when staffing is unavailable for a complete implementation by the business deadline of the project
- Early increments can be implemented by fewer people, and depending on the acceptability of the core product, more resources can be added to implement subsequent stages.
- Increments can be planned to manage technical risks.

Demerits:

- Needs good planning and design
- Needs a clear and complete definition of the whole system before it can be broken down and built incrementally.
- Total cost is higher than waterfall
- Agreement on the core product is not easy
- Client agreement is necessary
- Each phase is rigid and do not overlap each other.
- Total planned testing effort may increase.
- Problems may arise pertaining to system architecture because not all requirements are gathered up front for the entire software life

5. Evolutionary Model - Spiral:

Merits:

- Realistic approach to the development because the software evolves as the process progresses. In addition, the developer and the client better understand and react to risks at each evolutionary level.
- The model uses prototyping as a risk reduction mechanism and allows for the development of prototypes at any stage of the evolutionary development.
- It maintains a systematic stepwise approach, like the classic waterfall model, and also incorporates into it an iterative framework that more reflect the real world.
- Its design flexibility allows changes to be implemented at several stages.
- Process of building up large systems into small segments makes it easier to do cost calculations.
- As client will take active part in development of the each segment, retains control over the direction and implementation of the project.

Demerits:

- Cost involved in this model is usually high.
- It is a complicated approach especially for projects with a clear SRS.
- Skills required, evaluating and reviewing project from time to time, need expertise.
- Rules and protocols should be followed properly to effectively implement this model. Doing so, throughout the span of project is tough.
- Due to various customizations allowed from the client, using the same prototype in other projects, in future, is difficult.
- It is not suitable for low risk projects.
- Meeting budgetary and scheduling requirements is tough if this development process is followed.
- Amount of documentation required in intermediate stages makes management of project very complex affair.
- It needs extensive skill in evaluating uncertainties or risks associated with the project and their abatement.

- Project’s success is highly dependent on the risk analysis phase
- Doesn’t work well for smaller projects.
- It works on a protocol, which needs to be followed strictly for its smooth operation. Sometimes it becomes difficult to follow this protocol.
- There is a requirement for further explanation of the steps involved in the project such as breakthrough, blueprint, checkpoints and standard procedure.
- Lack of milestones.

6. Evolutionary Model - Concurrent:

Merits:

- Changes can be made fairly quickly.
- Easy to understand and keep track of the project.
- Parallel working on different tasks that will help in time management.
- Risk decreases, as we can make changes fast.
- Regular client feedback.

Demerits:

- There can be a possibility of improper alignment of interleaving processes may take place.
- The SRS must be regularly updated to show editions.
- It require restrictions to keep a regular check so that new features are not added too late in the project making its implementations impractical.

Our Selection:

After analysing of the project structure and client requirement, we have decided to go for the Incremental Evolutionary Model.
The reasons for our selection are:

- We had two other options which were also suitable:
    1. Iterative model- Rejected due to demand of sub-module by our client (Prof. Vijay Kumar Chakka) before deadline of the project.
    2. Prototyping Model: Rejected as we didn't find any need of presenting prototype of the project to our client as he is clear about the deliverables.

- We do not have much prior knowledge of working on real life project so it will be beneficial for us to get feedback from the client after some regular checkpoints. With the feedback we will be able to test our project thoroughly from core.

- We have specific goals for our each phase.

- Client have clear idea of deliverables and deadline of submission of modules.

- Coupling between the features is not much so it will be easier for us to divide the work based on same.

- It would be easy for us to keep an eye on the way our project modules are being handled.

- We have to provide some features of the project to our client before the deadline due to which we have to follow the evolutionary model so that the client can use that core functionality and then later we can add features and improve the product according to the reviews. The client has also agreed on the selection of Incremental model for the project.

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