**Software Development Lifecycles**

Iterative software lifecycle models

Rapid Application Development (RAD) is one of the main methods of developing software, RAD uses rapid prototyping with no significant pre planning during the model lifecycle. This allows for the software to be rapidly deployed at an early stage during its development for quick customer feedback.This method allows for reuse of prototypes and keeps its integration throughout the stages of the softwares development.

The stages of this method are as follows,

* Analysis and Quick development,
* Prototype Circles, Build, Demonstration and Refine.
* Testing
* Implementation.

The Agile method is a iterative and incremental method of software development, the main focus on this method is the flexibility and rapid delivery of the software. This method uses small builds which are then provided in iterations which are rapidly worked on within a few weeks generally with multiple teams working on different parts of the software at the same time. .

The stages of this method are as follows,

* Brainstorm
* Design
* Development
* Quality Assurance
* Deployment

Sequential software lifecycle models

The Waterfall method is a sequential software development model, its is regarded as the first model to be used for software development. Each phase of the waterfall method must be completed before the project can be continued. This method is an easy method to use and understand because of its linear flow, this also means that multiple modules cannot be worked on at the same time.

The stages of this method are as follows,

* Definition of Requirements
* System and Software Design
* Implementation and Unit Testing
* Integration and System Testing
* Deployment and Maintenance

The V-Model method is a sequential software development model. This method is an extension of the waterfall model and each phase has its own testing phase during development. This method uses a V shape with Verification on one side of the “V” and Validation on the opposite side of the “V”. Just as with the Waterfall method each phase of the V model must be completed before starting a new phase.

The stages of this method are as follows,

* Business Requirements
* Acceptance Testing
* System Requirements
* System Testing
* High Level Design
* Integration Testing
* Low Level Design
* Unit Testing
* Coding

Risk Management within the Spiral Model

The Spiral model is one of the more indepth software development models, this leads to risk being mitigated. A risk is a problem that hasn’t occurred yet, the spiral model deals with this issue by having successive iterations. The project starts with the first phase by determining objectives and requirements, in the second phase the risks and solutions are identified and a prototype is made, as the project progresses more and more risks and solutions are identified until the software is finally implemented. This means that the Spiral model is low risk with risks being identified and solved throughout the project so when the project reaches the final testing phase there is not a myriad of problems as they have already been solved with no unnecessary delay to implementation.

Why is a particular lifecycle model selected?

The Spiral model is most likely to be selected over other models for large and expensive projects that require constant user feedback. An example of this would be large gaming titles where patches and updates are released regularly. Large games such as Escape From Tarkov have many elements to them, a lot of elements that can go wrong. The game uses realistic shooting in which physics needs to be correct for the game to function properly, although most of these errors will be fixed because of how the Spiral model is designed some of these errors can be accidentally overlooked during testing before the patch or the update goes live, this requires the users to report pack those errors so they can be fixed during the next iteration. The Spiral model is optimal for large game developers because they can release the games early on during development where they can do the Alpha/Beta testing publicly leading to the users themselves becoming part of the development cycle.