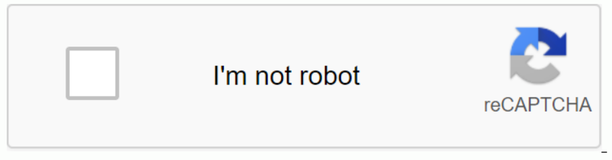


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# Spiral model of software development pdf

The spiral model is similar to the incremental model, with more emphasis on risk analysis. The spiral model has four phases: Planning, Risk Analysis, Engineering and Evaluation. A software project repeatedly passes through these phases into iterations (called Spirals in this model). The reference spiral, starting with the planning phase, collects the requirements and assesses the risk. Each subsequent spiral is constructed in the baseline spiral. It is one of the software development models such as Waterfall, Agile, V-Model. Planning phase: Requirements are collected during the planning phase. Requirements such as 'BRS' which is 'Bussiness Requirement Specifications' and 'SRS' which is 'System Requirement Specifications'. Risk analysis: In the risk analysis phase, a process is carried out to identify alternative and risk solutions. A prototype occurs at the end of the risk analysis phase. If any risk is found during risk analysis, alternative solutions are suggested and implemented. Engineering phase: In this phase the software is developed, along with the tests at the end of the phase. Therefore, development and testing are performed at this stage. Evaluation phase: This phase allows the customer to evaluate the project output to date before the project continues to the next spiral. Spiral Model Diagram: Advantages of spiral model: Therefore, the high amount of risk analysis is improved, avoiding risk. Good for big, mission-critical projects. Strong approval and control of documentation. Additional functionality can be added at a later date. The software occurs at the beginning of the software lifecycle. Disadvantages of the Spiral model: It can be an expensive model to use. Risk analysis requires very specific experience. The success of the project depends to a large extent on the risk analysis phase. It doesn't work well for smaller projects. When to Use spiral model: When cost and risk assessment is important For medium to high risk projects Reckless long-term project engagement due to possible changes in economic priorities Users are unsure of their needs Requirements Are complex Significant changes New product line (research and exploration) Other popular items expected : What are the phases of the Software Development Lifecycle (SDLC)? What are the advantages, disadvantages and when to use it in V-model? What are the advantages of the iterative model, the disadvantages and when to use it? What is the Waterfall model- Examples, pros, disadvantages and when to use it? What are the advantages of the RAD model, the disadvantages and when to use it? Suggest a new definition proposed definitions for inclusion in The Economictimes.comSoftware-DevelopmentDefinition: The spiral model is similar to incremental development for a system, with more emphasis on risk analysis. The spiral model has four phases: Planning, Design, Construction and Evaluation. A software project repeatedly repeatedly through these phases in iterations (called Spirals in this model). Description: These phases are - Planning: This phase begins with the collection of business requirements. In subsequent spirals as the product matures, the identification of system requirements and unit requirements are performed at this stage. This also includes understanding system requirements through continuous communication between the customer and the analyst. At the end of the spiral the product is unfolded. Design: The design phase begins with design in the reference spiral and involves architecture, logical module design, physical product design, and final design in successive spirals. Build: The construction phase refers to the development of the final software product in each spiral. In the spiral when the product is only thought out and the design is being developed, a proof of concept (POC) is developed at this stage to obtain feedback from users. Then, in successive spirals more clearly about the requirements and design of a working model of the software called build is developed with a version number. These versions are sent to users for feedback. Risk assessment and analysis: Risk analysis includes the identification, estimation and observation of technical feasibility, such as slippage of programming and cost oversteer. After testing the build, at the end of the first iteration, the user evaluates the software and provides feedback. Depending on the customer evaluation, the development process enters the next iteration, and then follows the linear approach to implementing user-provided feedback. The process of iterations along the spiral continues with the entire life of the software. This article relies too much on references to primary sources. Please improve this by adding secondary or tertiary sources. (February 2017) (Learn how and when to delete this template message) Spiral model (Boehm, 1988). A number of misconceptions stem from excessive simplifications in this widely circulated diagram (there are some errors in this diagram). [1] Software Development Core Activities Processes Processes Design Design Construction Tests Debugging Deployment Maintenance Paradigms and Agile Cleanroom Incremental Prototyping Spiral V Model Waterfall Methodologies and Frameworks ASD DevOps DAD DSDM FDD IID Kanban Lean SD LeSS MDD MSF PSP RAD RUP SAFeS Scrum SEMAT OpenUP UP XP Supporting Disciplines Configuration Management Documentation Quality Assurance Software (SQA) Project Management User Practices ATDD BDD CCO CI CD DDD PP SBE Stand-up TDD Tools Compiler Debugger GUI Ide Design Designer Build Automation Version Automation Infrastructure as Code Test Standards and Knowledge Bodies BABOK CMMI ISO 9001 ISO/IEC Standards PMBOK SWEBOK ITIL IREB Glossaries Artificial Computer Intelligence Science Electrical Engineering and Electronic Electronics Software Development Schema vte The Spiral Model is a risk-based software development process model. Based on the unique risk patterns of a given project, the spiral model guides a team to adopt elements of one or more process models, such as incremental, cascade, or evolutionary prototypes. History This model was first described by Barry Boehm in his 1986 article, A Spiral Model of Software Development and Enhancement. [2] In 1988 Boehm published a similar article[3] to a wider audience. These documents introduce a diagram that has been reproduced in many subsequent publications that discuss the spiral model. These early jobs use the term process model to refer to the spiral model, as well as incremental, cascade, prototyping, and other approaches. However, the characteristic mixing of the spiral model driven by the risk of the characteristics of other process models is already present: the [R]isk-driven subset of the spiral model steps allows the model to adapt to any appropriate mix of a specification-oriented, prototype-oriented, simulation-oriented software approach oriented to automatic transformation or another approach to software development. [3] In later publications,[1] Boehm describes the spiral model as a process model builder, where risk-based options for a project generate an appropriate process model for the project. Therefore, incremental, cascade, prototype, and other process models are special cases of the spiral model that conform to the risk patterns of certain projects. Boehm also identifies a number of misconceptions derived from excessive simplifications in the original spiral model diagram. He says the most dangerous misconceptions are: that the spiral is simply a sequence of waterfall increments; that all project activities follow a single spiral sequence; that each activity should be performed on the diagram, and in the order shown. While these misconceptions may conform to the risk patterns of some projects, they are not true for most projects. In a report of the National Research Council[4] this model was expanded to include risks related to human users. To better distinguish them from dangerous spiral aspects, Boehm lists six features common to all authentic spiral model applications. Recognitions[edit] The six invariant spiral model Authentic spiral model applications are driven by cycles that always show six characteristics. Boehm illustrates to each with an example of a similar dangerous spiral that violates the [1] Defining artifacts simultaneously By sequentially defining key artifacts for a project often increases the chance of developing a system that meets stakeholder win conditions (objectives and constraints). This invariant excludes similar dangerous spiral processes that use an incremental cascade sequence passed in the configuration where the underlying assumptions of the cascade model make Apply. Boehm lists these assumptions as follows: Requirements are known before deployment. Requirements have no unresolved and high-risk implications, such as risks due to cost, scheduling, performance, security, user interfaces, organizational impacts, etc. The nature of the requirements will not change much during development or evolution. Requirements are consistent with all expectations of key system stakeholders, including users, customers, developers, maintainers, and investors. The right architecture for implementing requirements is well understood. There is enough calendar time to proceed sequentially. In situations where these assumptions apply, it is a risk of the project not to specify the requirements and proceed sequentially. The waterfall model thus becomes a special case driven by the risk of the spiral model. Performing four basic activities in each cycle This invariant identifies the four activities that should occur in each cycle of the spiral model: Consider the victory conditions of all critical stakeholders for success. Identify and evaluate alternative approaches to meet victory conditions. Identify and resolve risks arising from selected approaches. Get approval from all critical stakeholders for success, plus a commitment to continue the next cycle. Project cycles that omit or cut any of these activities run the risk of wasting efforts when looking for options that are unacceptable to key or too risky stakeholders. Some similar dangerous spiral processes violate this invariant by excluding key stakeholders from certain phases or sequential cycles. For example, system maintainers and administrators may not be invited to participate in system definition and development. As a result, the system is at risk of not meeting its victory conditions. Risk determines the level of effort For any project activity (for example, requirements analysis, design, prototyping, testing), the project team must decide how much effort is sufficient. In authentic spiral process cycles, these decisions are made by minimizing overall risk. For example, investing extra time testing a software product often reduces the risk because the market rejects a poor quality product. However, the additional testing time could increase the risk due to the early entry of a competitor into the market. From a spiral model perspective, tests should be performed until the total risk is minimized, not more. Dangerous spiral resemblances that violate this invariant include evolutionary processes that ignore risk due to scalability issues, and incremental processes that invest heavily in a technical architecture that must be redesigned or replaced to accommodate future product increments. Risk determines the degree of detail For any artifact in the project (for example, requirement specification, design document, test plan), the project team must how much detail is enough. In authentic spiral process cycles, these decisions are made by minimizing overall risk. Taking into account the specification of requirements as an example, the project must specify precisely those characteristics in which the risk is reduced by precise specifications (for example, interfaces between hardware and software, interfaces between the principals and the subcontractors). In contrast, the project should not specify precisely those characteristics in which a precise specification increases risk (for example, graphical screen layouts, ready-to-use component behavior). Use anchor point milestones Boehm's original description of the spiral model did not include any process milestones. In subsequent refinements, it introduces three anchor point milestones that serve as indicators of progress and commitment points. These anchor point milestones can be characterized by key questions. Life cycle objectives. Is there a sufficient definition of a technical and management approach to meet everyone's victory conditions? If stakeholders agree that the answer is Yes, then the project has clarified this LCO milestone. Otherwise, the project may be abandoned, or stakeholders may commit to another cycle to try to reach yes. Life Cycle Architecture. Is there a sufficient definition of the preferred approach to meet everyone's victory conditions, and are all significant risks eliminated or mitigated? If stakeholders agree that the answer is Yes, then the project has clarified this ACL milestone. Otherwise, the project may be abandoned, or stakeholders may commit to another cycle to try to reach yes. Initial operational capacity. Is there sufficient preparation of the software, site, users, operators and maintainers to meet everyone's conditions when starting the system? If stakeholders agree that the answer is Yes, then the project has completed the IAO milestone and is launched. Otherwise, the project may be abandoned, or stakeholders may commit to another cycle to try to reach yes. The dangerous spiral aspects that violate this invariant include evolutionary and incremental processes that compromise significant resources to implement a solution with a poorly defined architecture. [clarification required] The three milestones of the anchor point easily fit into the Rational Unified Process (RUP), with LCO marking the boundary between the Initiation and Development phases of RUP, LCA marking the boundary between the Processing and Construction phases, and the IAO marking the boundary between the Construction and Transition phases. in the system and its life cycle This invariant highlights the importance of the overall system and the long-term concerns that span its entire life cycle. Excludes dangerous spiral aspects that focus too much on the initial development of software code. These processes may result from following published approaches to or structured software analysis and design, while neglecting other aspects of the needs of the project process. References to b c Boehm, B (July 2000). Spiral development: experience, principles and refinements (PDF). Special Report. Institute of Software Engineering. CMU/SEI-2000-SR-008. Boehm, B (August 1986). A spiral model of software development and improvement. ACM SIGSOFT Software Engineering Notes. 11 (4): 14–24. doi:10.1145/12944.12948. S2CID 207165409. b Boehm, B (May 1988). A spiral model of software development and improvement (PDF). IEEE computer. 21 (5): 61–72. doi:10.1109/2.59. S2CID 1781829. • Pew, R.W.; Mavor, A.S., eds. (2007). Human-system integration into the system development process: A new aspect. Washington, DC: National Academy Press. ISBN 978-0-309-10720-4. Obtained from