Course: Software Technologies and Enterprise Architecture

WEEK 7: Agile Architecture

Lemlem Kassa(Dr.)
Addis Ababa Science and Technology University (AASTU)

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WEEK 7: Agile Architecture

Contents

- Overview of Agile Architecture
- Agile Project Planning
- Agile and Enterprise Architecture
- Applications of the Agile Methodology

WEEK 7: Agile Architecture

Learning Outcomes

By the end of this unit, students will be able to:

- Understand the overview of Agile Architecture, including its iterative nature and key principles.
- Explain the Agile project planning process, from vision to daily execution.
- Analyze the relationship between Agile and Enterprise Architecture, and modern frameworks.
- Identify the applications, advantages, and disadvantages of the Agile methodology in various project contexts

Overview of Agile Architecture

- Agile refers to something that is quick or adaptable.
- A software development approach based on iterative development is referred to as an “agile process model.”
- Agile approaches divide projects into smaller iterations or sections and avoid long-term planning.
- The scope and requirements of the project are defined at the start of the development phase.
- The number of iterations, duration, and scope of each iteration are all clearly determined ahead of time.
- Unlike the Waterfall paradigm, both development and testing operations are concurrent under the Agile model of software testing.

[1]. Agile Model,” InterviewBit, InterviewBit, 2022. https://www.interviewbit.com/blog/agile-model/

Overview of Agile Architecture

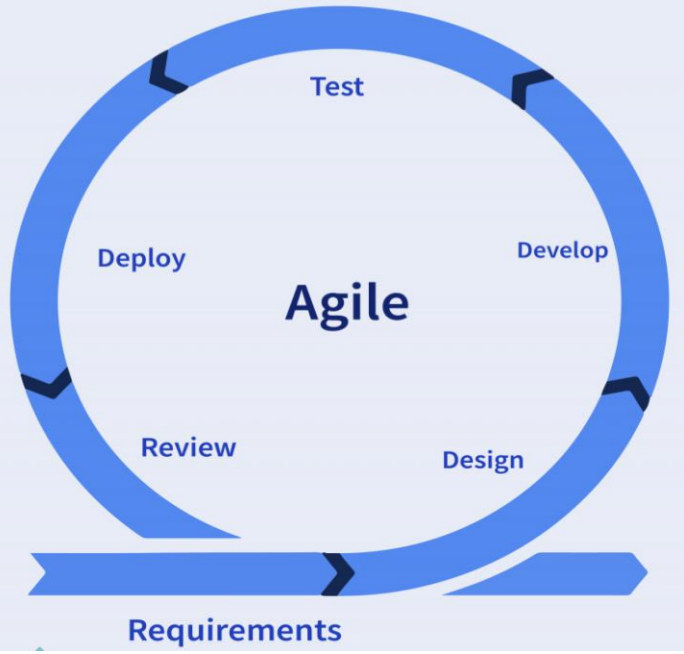
Agile process model

- In the Agile process model, each iteration is a small-time “frame” that lasts anywhere from one to four weeks.
- This time frame is termed as Time Box i.e., the amount of time taken to finish an iteration.
- The greatest length of time required to provide an iteration to clients is referred to as a time-box. As a result, the end date for an iteration remains unchanged.
- The delivery of an increment to the client after each time box is the basic principle of the Agile approach.
- The segmentation of the complete project into smaller pieces helps to reduce the total project delivery time requirements while minimizing project risk.
- Before a working product is demonstrated to the client, each iteration requires a team to go through the entire software development life cycle, which includes planning, requirements analysis, design, coding, and testing

Cont. …Overview of Agile Architecture

Different Phases of Agile Methodology

- **Requirement Gathering:** Define the criteria at this step. Describe the project's business opportunities and estimate the time and effort required to complete it. Assess technical and economic feasibility based on this information.
- **Design the requirement:** Work with stakeholders to define requirements once we've defined the project.
- To demonstrate how new features function and how they will fit into our existing system, use a user flow diagram or a high-level UML diagram.



[1]. Agile Model," InterviewBit, InterviewBit, 2022. https://www.interviewbit.com/blog/agile-model/

Cont. ….Overview of Agile Architecture

Cont.….Different Phases of Agile Methodology

- **Develop/Iteration:** The product will go through several stages of development before being released, thus it will have basic, rudimentary functionality. Ultimately, deploying a non-static product or service.
- **Test:** This phase basically involves the testing team i.e., the Quality Assurance team checks the product's performance and seeking for the bug during this phase.
- **Deployment:** The team creates a product for the user's work environment in this phase.
- **Review / Feedback:** The final phase is to get feedback after the product has been released. This is where the team receives feedback on the product and works through it

Cont. ...Overview of Agile Architecture

Key Principles of Agile Software Architecture

- Agile software architecture is adaptable and easy to update.
- It enables teams to create powerful and quick software.
- This method ensures that the program functions properly and evolves to meet new requirements.
- Agile methodology architecture emphasizes adaptability while ensuring that software remains structured.
- This approach ensures that teams can build scalable solutions without compromising flexibility.

Cont. …Overview of Agile Architecture

Architectural Principles in Agile

- Understand the key architectural principles that are shaped by **a**gile methodology.
- Scalable system design entails building programs that can handle additional jobs as they grow.
- Teams work exactly to ensure that each component is excellent, adopting practices from Extreme Programming (XP) to maintain high code quality and responsiveness to change.
- Software refactoring techniques approaches improve the software over time. It's like cleaning and organizing our room to make it more functional. The crew inspects each item to ensure that it fits seamlessly with the others.
- They develop things incrementally, testing along the way. This methodical approach aids in the development of user-friendly applications that may expand as needed.

[2]. Software Architecture in Agile Development: A Complete Guide, Nataliya Tidwell, On Wave Group, 2025.https://onwavegroup.com/blog/understanding-software-architecture-in-agile-development

Cont. …Overview of Agile Architecture

The Balance Between Flexibility and Structure

- Software engineering approaches assist us in maintaining an optimal equilibrium. Consider it like a building with special blocks that can change shape as needed.
- The blocks must be both robust and easy to move. This improves the program's effectiveness for all participants.
- Agile execution allows us to make changes rapidly when necessary. It's like owning a special toy that can change into different things. Teams work together to ensure that everything remains robust but flexible.
- This allows the program to develop and adapt while remaining fully functional. It is like having the best of both worlds!

[2]. Software Architecture in Agile Development: A Complete Guide, Nataliya Tidwell, On Wave Group, 2025.https://onwavegroup.com/blog/understanding-software-architecture-in-agile-development

Cont. …Overview of Agile Architecture

Continuous Feedback and Improvement

- Continuous improvement allows us to care for our digital garden every day. We make sure everything is working properly.
- We solve tiny problems before they become major ones, emphasizing technical debt management to maintain code quality over time.
- Customer feedback loops are similar to asking friends what they think of your drawing. Their suggestions help to improve the picture.
- Teams pay careful attention to what people say. They make adjustments to improve the program's usefulness. In this manner, the software improves over time.

Agile Project Planning

The Agile roadmap demonstrates where we want to go and how to get there.

- Project planning techniques assist us in breaking down our job into smaller, more manageable tasks using user stories to define requirements from an end-user perspective. Teams work on these items in short bursts.
- This makes it easier to modify plans as needed.
- It's similar to being able to change the direction of our quest if we discover a better path.
- This approach of working allows teams to produce better software without becoming overwhelmed by large jobs.

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Cont.. …Agile Project Planning

- An agile project schedule involves steps designed to facilitate flexibility, collaboration, and iterative development.

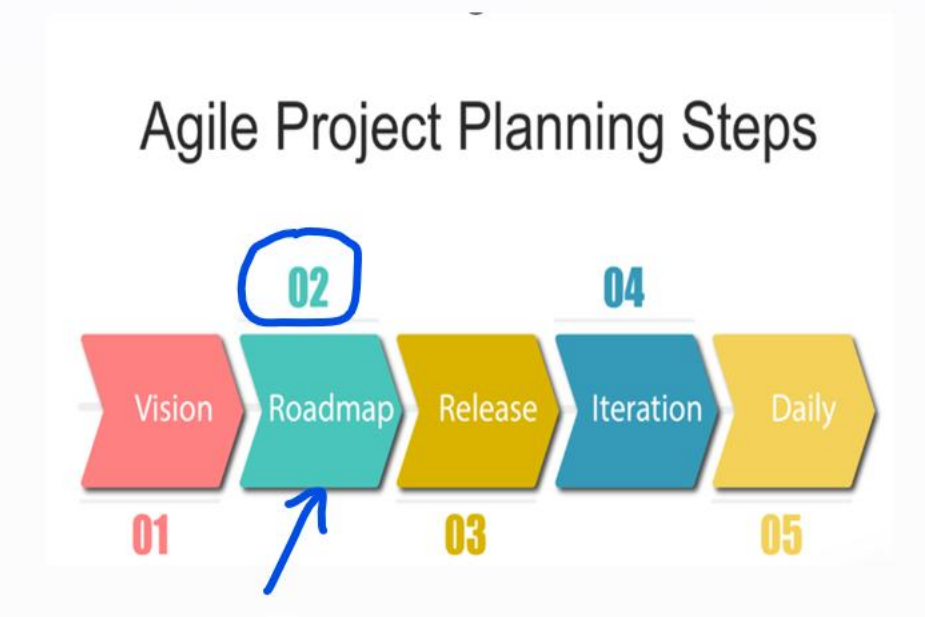
a. Project Vision

- Begin our agile development plan with a visionary approach. Establish a robust strategy that aligns with our organizational goals. Capture the project vision through a user story, specifying the user, the project's essence, and its benefits.
- Consider who our users are, what they need, and why the product, feature, or piece of code will help them. With this user story as a foundation, define objectives, set KPIs for success, and outline critical solutions.
- Identify and engage stakeholders who have an interest or influence on the project. Gather their input to ensure the project meets their expectations and needs.

Cont.. …Agile Project Planning

b. Roadmap

- Establish overarching project goals that align with organizational objectives.
- A roadmap for our Agile project needs to be created, which gives us a sense of where we are heading.
- To have some key milestones, it is necessary to divide the project into specific deliverables or features.
- Lastly, divide up deliverables into their respective subcategories for an iterative approach.



[3]. Agile Planning: How to Start Planning in Agile, Nataliya Timoshina, Alpha Serve, 2024,.https://www.alphaservesp.com/blog/agile-planning-how-to-start-planning-in-agile

Cont.. …Agile Project Planning

c. Release Planning

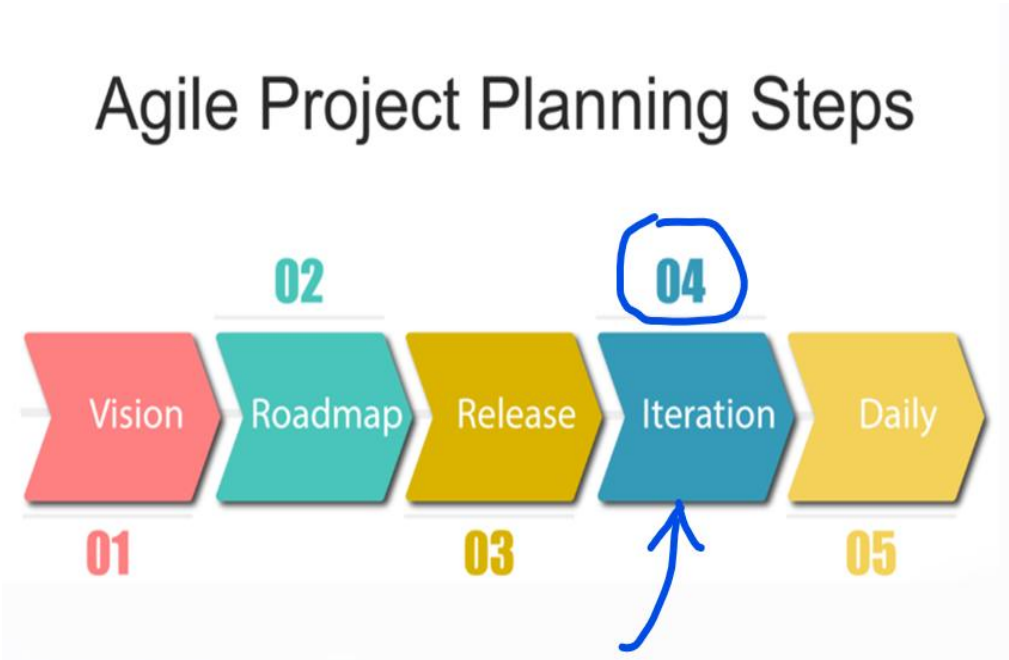
- The next step is moving from a concept view and delving into the details of release planning.
- An agile software development plan is good at breaking a project into manageable increments and considering having a *minimum viable product (MVP)* available by a specific date.
- Note all the requirements as well as create strict deadlines. Then, prioritize features, set goals, and create a plan showing what each release aims to achieve so that all objectives above align.

[3]. Agile Planning: How to Start Planning in Agile, Nataliya Timoshina, Alpha Serve, 2024.https://www.alphaservesp.com/blog/agile-planning-how-to-start-planning-in-agile

Agile project Planning

d. Iteration Planning

- That is the time to zoom into the short-term cycles that fuel Agile's iterative engine.
- The plan elements usually take the form of sprints, typically lasting 2-4 weeks.
- In this phase, the team selects specific items from the product backlog, defines tasks, estimates efforts, and commits to delivering a shippable product increment by the end of the iteration.



[3]. Agile Planning: How to Start Planning in Agile, Nataliya Timoshina, Alpha Serve, 2024,.https://www.alphaservesp.com/blog/agile-planning-how-to-start-planning-in-agile

Cont.. …Agile Project Planning

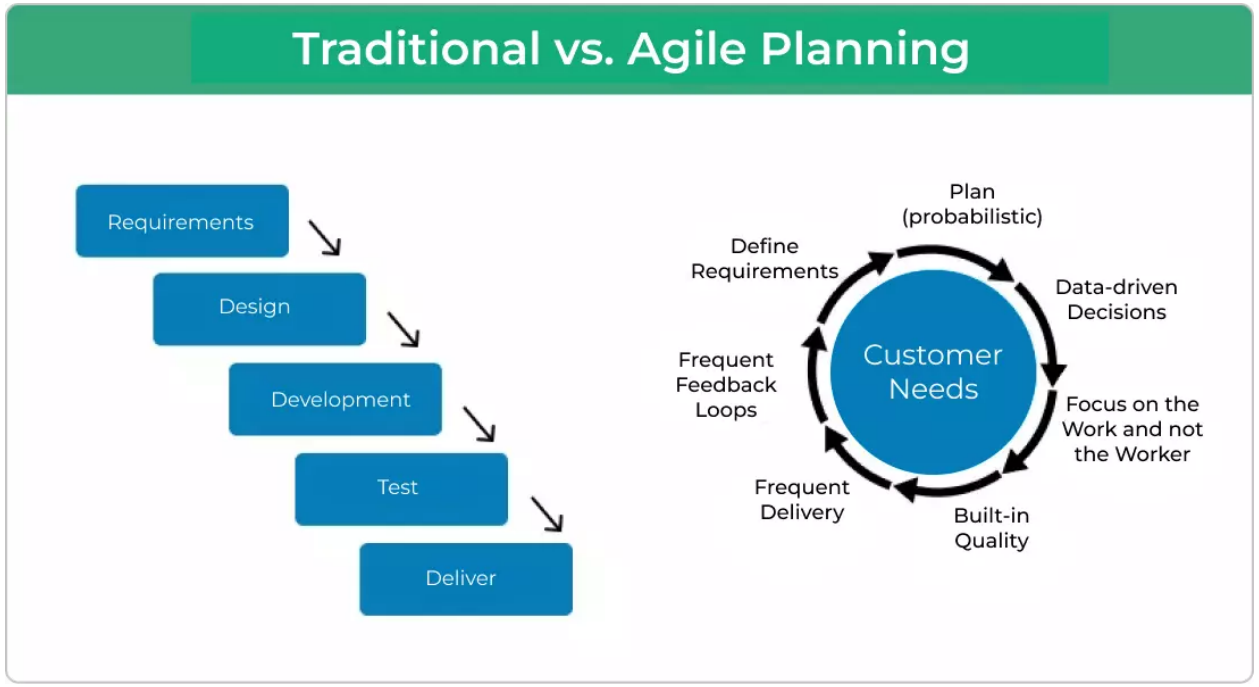
e. Daily Planning

- Include agile scheduling, the heartbeat of Agile — daily planning, also known as the Daily Stand-Up or Daily Scrum.
- This short and focused meeting, lasting around 15 minutes, ensures the team synchronizes activities, discusses progress, and aligns efforts for the upcoming 24 hours.
- It's a crucial practice to define the scope, format, dates, and time for these stand-ups.

Cont.. …Agile Project Planning

Agile Planning vs. Traditional (Waterfall) Planning

- Agile planning and waterfall planning solve fundamentally different problems.
- Waterfall works when change is expensive.
- Agile planning works when change is inevitable.



[4]. Agile Project Planning: How to Plan Successfully in an Agile Environment?, Businessmap (formerly Kanbanize), Businessmap.io, 2023. https://businessmap.io/agile/project-management/planning

Cont.….Agile Project Planning

….Agile Planning vs. Traditional (Waterfall) Planning

- **Agile planning is iterative.** Work is delivered in short cycles and refined continuously. Traditional planning is sequential. Teams move step by step through predefined phases, with little room for change once execution begins.
- **Flexibility is another major difference**. Agile planning is highly flexible, allowing teams to adjust as new information emerges. Traditional planning is rigid, since changes later in the process are often costly and disruptive.

Cont.….Agile Project Planning

….Agile Planning vs. Traditional (Waterfall) Planning

- **The way scope is handled also differs**. In Agile, scope is evolving. Priorities shift based on feedback and changing needs. In traditional planning, scope is fixed from the start and expected to remain stable.
- **Feedback cycles highlight another contrast.** Agile planning relies on continuous feedback, helping teams validate assumptions early and often. Traditional planning typically gathers feedback late in the process, leading to costly rework.
- **Forecasting follows the same pattern**. Agile uses probabilistic forecasting, based on real performance data. Traditional planning relies on deterministic estimates, assuming that everything will go according to plan.

Agile and Enterprise Architecture

- Many enterprises claim that the Open Group Architecture Framework (TOGAF) is a waterfall model that does not meet their expectations for modern Enterprise Architecture. Instead, they adopt a **Scaled Agile Framework (SAFe)** methodology to design their enterprises.
- The three pillars of Enterprise Architecture are: *Alignment, Insight, and Quality*.
    - **Alignment:** Enterprise Architecture (EA) aligns strategy to operations, business demand to IT supply, and ensures that the changes are in line with enterprise strategy and goals.
    - **Insight:** EA provides insight into current and desired states of the organization, information systems, and technology.
    - **Quality:** EA helps to improve the quality of individual solutions and simplifies their development and maintenance.

[5]. Agile and Enterprise Architecture: A Strategic Alliance, LeanIX (Corporate Author), LeanIX GmbH, 2023. https://www.leanix.net/en/blog/agile-and-enterprise-architecture-a-strategic-alliance.

Cont……Agile and Enterprise Architecture

Agile Enterprise Architecture

- Agile is a methodology used for software development and project management.
- In Agile methodology, individual projects are broken down into smaller, more easily managed segments to speed up design processes and produce quality products as quickly as possible.
- Agile Architecture is collaborative, lean, and adoptable.
- It supports innovation and the adoption of all potential digital technologies perhaps conducive to making enterprises more agile.[2]

Cont. ….Agile and Enterprise Architecture

Agile EA Framework (AEAF)

- With Agile, the focus of an Enterprise Architect is to:
  - Satisfy the customer through the early and continuous delivery of valuable software;
  - Accept requirements (no matter the stage of development);
  - Deliver frequent working software, ranging from within a couple of weeks to a couple of months (the shorter the better…);
  - Maintain continuous, daily collaboration with business divisions and software developers throughout projects;
  - Chart efficient and effective methods of conveying information to and within a development team (quite often via in-person meetings);
  - Measure progress with ongoing development of working software, and give continuous attention to technical excellence and good design.

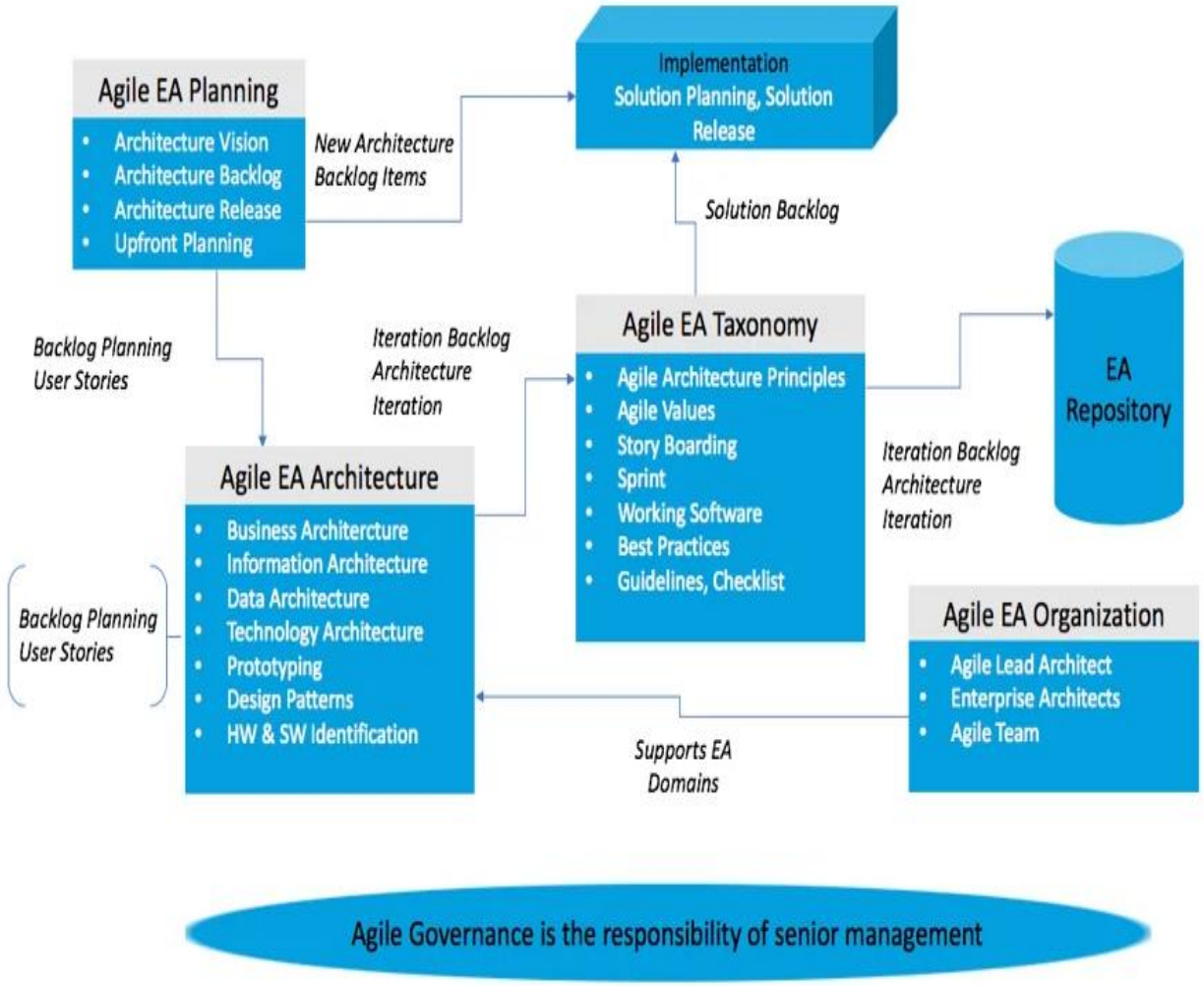
Cont. …..Agile and Enterprise Architecture

Cont...Agile EA Framework (AEAF)

- It breaks barriers between IT and business, so as to increase levels of co-location by unit and via fast-forming teams that combine for new projects.
- It functions to evolve and iteratively improve Minimum Viable Products (MVP) based on real-time customer feedback.
- Helps digitalize enterprises by implementing the necessary architectures to support Cloud, DevOps, Microservices, Data Analytics, Test Automation, and APIs.
- The AEAF defines architectures by using an iterative life cycle to allow the architectural design to evolve gradually as various problems and constraints become clearer.
- The architecture and the gradual building of the system must move hand-in-hand, and its subsequent iterations must address or implement any and all issues and decisions to contribute to a truly flexible architecture.
- The AEAF covers the details of each activity, purpose, and associated architectural relationship in the following manner.

[5]. Agile and Enterprise Architecture: A Strategic Alliance, LeanIX (Corporate Author), LeanIX GmbH, 2023. https://www.leanix.net/en/blog/agile-and-enterprise-architecture-a-strategic-alliance.

Cont. …..Agile and Enterprise Architecture



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…Agile and Enterprise Architecture

(a) Agile EA Planning

- This step covers the Architecture Vision and all upfront architectural planning. At this stage, the objective is to address the central business problem and the concerns of the stakeholders.
- Efforts during an Architecture Vision provide the documentation necessary to proceed with further target architecture development.
- It covers the entire scope of the problem while also addressing stakeholder concerns, priorities, and preferences.
- The Architecture Backlog covers the *value, complexity, dependency, and urgency* of the product.

[5]. Agile and Enterprise Architecture: A Strategic Alliance, LeanIX (Corporate Author), LeanIX GmbH, 2023. https://www.leanix.net/en/blog/agile-and-enterprise-architecture-a-strategic-alliance.

Agile and Enterprise Architecture

(b) Agile Architecture Definition

- This step covers the defining of domain architectures in regards to business, application, data, and technology.
- It establishes a set of stakeholder-approved domain architectures with an agreed upon list of gaps and the corresponding ways to clear them.
- It also addresses the changes that enable the enterprise to meet the preferences of stakeholders. As part of an agile architecture definition, iteration planning will occur with daily “stand-up” meetings and “burn up/burn down” charts.
- Daily stand-ups and self-organizing teams work together to develop architecture during this planning.

[5]. Agile and Enterprise Architecture: A Strategic Alliance, LeanIX (Corporate Author), LeanIX GmbH, 2023. https://www.leanix.net/en/blog/agile-and-enterprise-architecture-a-strategic-alliance.

…Agile and Enterprise Architecture

(c) Agile EA Taxonomy

- Agile EA Taxonomy covers artifacts like Agile Architecture Principles and Agile Values to be adopted across an enterprise. It also covers the best practices, guidelines, and checklists to help those adhere to the Agile Architecture domain artifacts.
- A Sprint delivers useful parts of a working product. The core of the EA backlog is a properly limited EA Landscape.
- Working Software articulates expected outcomes without laboring in detail over how something has to be developed and executed. It limits work to relatively short-time intervals to minimize the amount of work in progress.
- Further, it identifies all predecessor and successor packages. The work product is traceable to an objective, so that if its delivery is delayed (*or fails*), the enterprise faces the consequence of altering the target architecture.

…Agile and Enterprise Architecture

(d) Implementation

- Agile teams take an incremental approach to ensuring that design is extensible and aligned with the vision while detailing and catering to enterprise needs.
- In order to be most effective, it helps when the Architecture group continues to look at the bigger picture while the team(s) focus on their sprint-based deliverables.
- All decisions should be made together to ensure the right balance—whether it's an agreement to the phases of the project from a business value standpoint, acceptance of new technical debt, or the design details for a particular framework or a component.

…Agile and Enterprise Architecture

Cont. ……(d) Implementation

As an Enterprise Architect of an Agile Architecture implementation, focus should be placed on:

- Intentional architecture (Architecture-as-a-Collaboration);
- Building the simplest architecture that can possibly work (established design principles);
- Coding it or modeling it (spikes, prototypes, domains, and use case models);
- Building it, testing it (designs for testability); and
- Implementing an architectural flow (architectural epics and the portfolio Kanban)

[5]. Agile and Enterprise Architecture: A Strategic Alliance, LeanIX (Corporate Author), LeanIX GmbH, 2023. https://www.leanix.net/en/blog/agile-and-enterprise-architecture-a-strategic-alliance.

…Agile and Enterprise Architecture

(e) Agile EA Organization

- EA teams need to work closely with agile teams daily to ensure a vision is successfully executed while incorporating the challenges and feedback from the teams and customers along the way.
  - **Agile Lead Architect:** Agile Lead Architects are the best product owners for an organization's Enterprise Architecture program. As a product owner, the ALA identifies the architecture required by an organization.
  - **Enterprise Architects:** components of Agile teams that help to develop, improve, and sustain Enterprise Architecture. Agile Architects are active members of development teams. They develop software where appropriate and act as architectural consultants to the team.
  - **Agile Team:** Services are small and developed by small teams. Agile makes it possible to release frequently in small chunks and hence show business progress.

Cont.…Agile and Enterprise Architecture

(f) EA Repository

- An EA Repository helps in storing Agile Architecture and development artifacts.

(g) Agile EA Governance Model

- Agile Governance creates a bridge between upper management and the teams that are completing projects.
- An established Agile EA Governance Model supports:
  - Self-dependent decisions of agile teams;
  - Capabilities amongst interdisciplinary agile teams to deal with complex topics
  - Reducing administrative overhead of Enterprise Architecture; and the view and impact of Enterprise Architecture.

[5]. Agile and Enterprise Architecture: A Strategic Alliance, LeanIX (Corporate Author), LeanIX GmbH, 2023. https://www.leanix.net/en/blog/agile-and-enterprise-architecture-a-strategic-alliance.

Applications of the Agile Methodology

When to use Agile Methodology?

- It is particularly well-suited for projects and organizations where the following conditions or needs are present:
  - **Unclear or Changing Requirements:** Agile is great for projects with requirements that aren't well-defined or might change.
  - **Complex Projects:** It's good for big, complex projects by breaking them into smaller pieces.
  - **Customer Focus:** Use Agile when making customers happy is a priority, and we want to involve them throughout.

[6]. What is Agile Methodology?, GeeksforGeeks, GeeksforGeeks, 2023 (Updated).https://www.geeksforgeeks.org/software-testing/what-is-agile-methodology

Cont. …Applications of the Agile Methodology

Cont. ..When to use Agile Methodology?

- **Quick Time-to-Market:** If you need to get your product out fast, Agile can help.
- **Small to Medium Teams:** Agile works well for teams of a few to a few dozen people.
- **Collaboration:** Agile promotes working together and open communication.
- **Regular Updates:** If you want to check progress often and make changes as needed.
- **Continuous Improvement:** Agile fosters a culture of always getting better over time.

[6]. What is Agile Methodology?, GeeksforGeeks, GeeksforGeeks, 2023 (Updated).https://www.geeksforgeeks.org/software-testing/what-is-agile-methodology

Advantages of Agile Model

- Communication with clients on a one-on-one basis.
- Continual Delivery
- Design that is both efficient and meets the needs of the company.
- Changes can be made at any moment.
- It cuts down on overall development time.
- Customer satisfaction is defined as the development and delivery of valuable software at a rapid pace.
- Customer, Developer, and Product Owner meet on a frequent basis to focus on the customer’s needs rather than processes and tools.
- The product is developed quickly and provided regularly within a few weeks rather than a month.

[7]. What is Agile Model? – Agile SDLC Methodology, InterviewBit, InterviewBit, 2024 (Updated).https://www.interviewbit.com/blog/agile-model/

Disadvantages of Agile Model

- There isn’t enough focus on the necessary design and documentation.
- The agile development process has a somewhat higher cost than traditional development methodologies.
- It isn’t appropriate for small-scale development projects.
- It is necessary for a project expert to make critical judgments during the meeting.
- If the project manager is unclear about the requirements and the outcome he or she desires, the project might easily go off track.
- Maintenance of the completed project can become challenging due to a lack of sufficient documentation once the project is completed and the developers are assigned to another project.

[7]. What is Agile Model? – Agile SDLC Methodology, InterviewBit, InterviewBit, 2024 (Updated).https://www.interviewbit.com/blog/agile-model/

Summary

- Agile Process Model: Defined as a quick and adaptable software development approach that divides projects into small iterations or "Time Boxes" lasting one to four weeks.
- Phases of Agile: Includes requirement gathering, design, development (iteration), testing, deployment, and a final review/feedback phase.
- Core Architectural Principles: Emphasizes adaptability, scalability, and technical excellence through practices like continuous refactoring and Extreme Programming (XP).
- Balance of Flexibility and Structure: Agile architecture aims to be robust enough to remain functional while being flexible enough to change shape based on new requirements.
- Agile vs. Waterfall: Agile is iterative and thrives when change is inevitable, whereas Waterfall is sequential and better suited for environments where change is expensive.
- Enterprise Architecture (EA) Integration: Modern enterprises often use the Agile EA Framework (AEAF) or Scaled Agile Framework (SAFe) to align business strategy with rapid IT delivery.
- Project Planning Steps: Project Vision, Roadmap, Release Planning, Iteration Planning, and Daily Planning.

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1. Agile Model," InterviewBit, InterviewBit, 2022. https://www.interviewbit.com/blog/agile-model.
2. Software Architecture in Agile Development: A Complete Guide, Nataliya Tidwell, On Wave Group, 2025. https://onwavegroup.com/blog/understanding-software-architecture-in-agile-development.
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