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How agile architecture can be applied in large-scale agile environments –

Part 2: How is agile architecture development supposed to work?

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The Butterfly Programme progresses and Peter is happy that his new architecture role concept has been approved and can be implemented quickly. He hopes that the new, dedicated programme architecture team will strengthen alignment and collaboration between the different Solution Architects and the delivery teams, and boost involvement in strategic programme decisions. However, to utilise the new organisation concept and the new manpower of the architecture team and deliver with regard to the promises made, Peter now needs a more stringent mode of operation.

Principles of lean-agile architecture work

Peter is happy to have used SAFe as the base framework for his organisational restructuring. He decides to revisit the SAFe website in the hope of finding a basis for collaboration and processes in agile programmes. The paragraph "Balance Intentionality and Emergence" catches his interest as it describes the envisioned relationship between Architects and development teams in the Butterfly Programme:

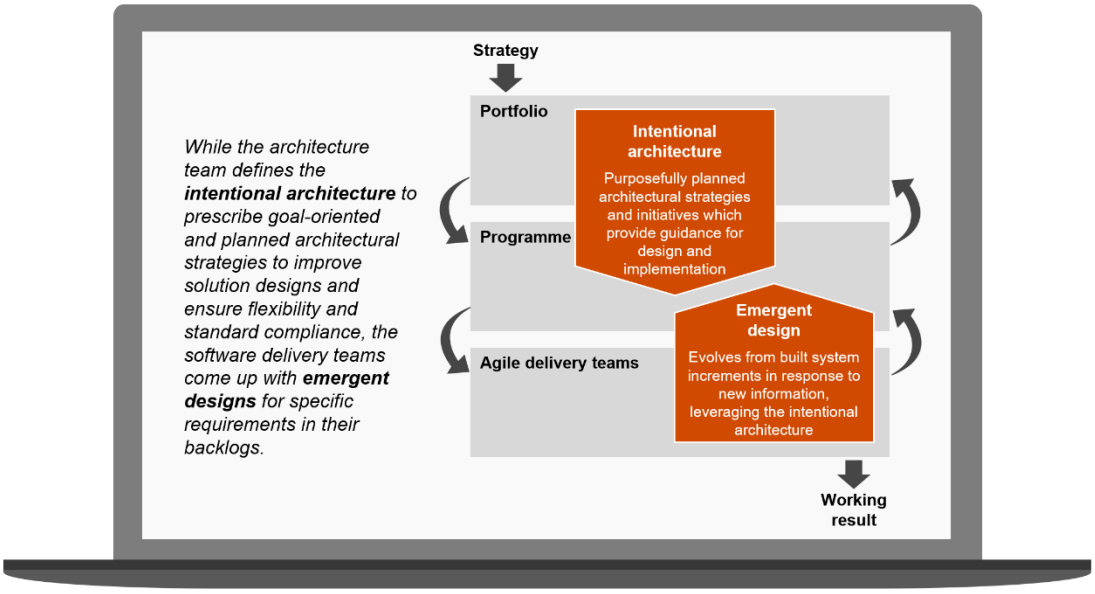

Figure 1: Intentional architecture vs. emergent design

This interaction between top-down architecture guidance and bottom-up real-world solution creating is exactly what Peter has been looking for. It ensures that the overall architecture of the Butterfly Programme will develop in an intentional manner as solutions are developed in compliance with the corporate standards and guidelines. In addition, it allows the System Architects and developers to come up with best-fitting solutions to their users' needs.

Peter realises that so far, the programme has been carrying out *Emergent Architecture (aka architecture by accident),* and thus lacked the basic guardrails to support distributed agile solution design.

To better understand why the architecture design and alignment had not been working in the past, he meets with Max, one of the Solution Architects. It soon becomes apparent that Peter's previous premonition is coming true. Max explains that an important aspect of the heavily delayed feature release was the integration of two applications, each developed by different teams. There was no sufficient alignment between the teams in advance on the subject of interface design (API operations, data structures) and technology to be used (REST vs. SOAP). In addition, the discussion on the introduction of an integration layer to ensure decoupling required long rounds of coordination and had already led to an initial delay. However, the critical problems emerged late during end-to-end testing. The teams had previously only tested against API mock-ups. The many errors during testing indicated that there was a different understanding of the data attributes to be exchanged and their semantics. Predefined architecture guidelines and better communication between teams and management could have avoided the delay and the resulting firefighting mode.

Peter thanks Max for his honest feedback and feels that his concerns have been justified and is annoyed with himself. How could he have overlooked all these points for so long?

After a few moments of serious contemplation, he pulls himself together and writes down his first conclusions based on the conversation and his previous research:

- **In large agile transformation programmes, the architecture must evolve both top-down (intentional) and bottom-up (emergent):** top-down to provide the teams with fundamental architectural guidance for the entire programme; bottom-up to allow the teams to develop solutions autonomously and quickly within the intentional framework to best address any technical challenges and customer needs.
- Architecture-related topics must be **transparent on both a portfolio and a programme level** and need to be **integrated early in the demand management process** to identify dependencies and prioritise accordingly.
- Architecture design should be developed in a lean-agile manner. That means **iteratively working out "good enough" architecture** for the challegnes at hand and avoid big design up-front (BDUF).

Peter knows that the current structure and operating model cannot be changed overnight and he needs professional support to conceptualise and operationalise it. Together with one of his external consultants, Hanna, he intends to map out the detail of the future operating model. Based on his conclusions and Hanna's outside-in views, they brainstorm a first concept which outlines three core areas:

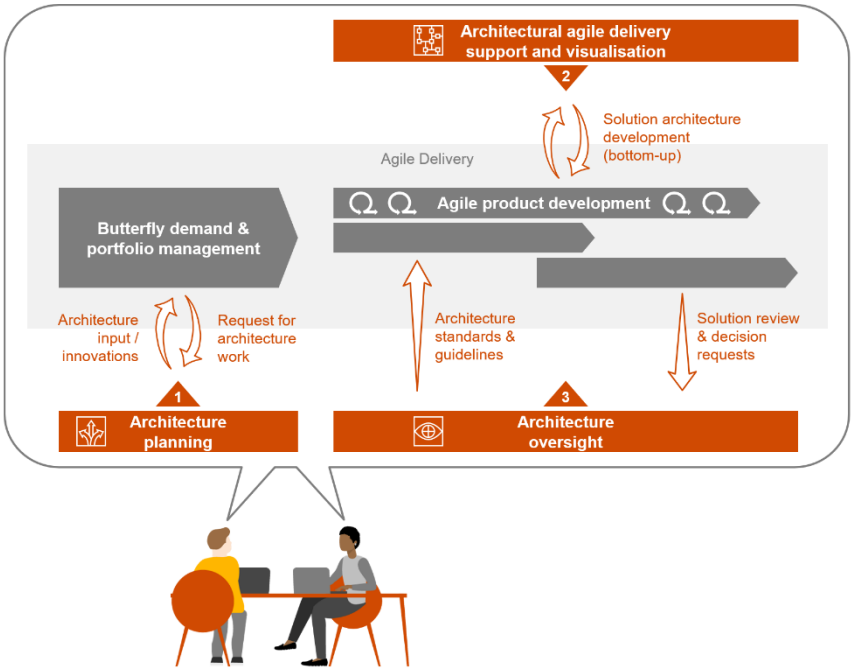

Figure 2: Architectural planning process

1. **Architecture planning:** to establish early interaction with the business and the programme leadership to understand their demands and priorities and derive future architecture work
2. **Architectural agile delivery support and visualisation:** to enable the development teams to come up with solution designs fitting to the overall target architecture and foster cross-team alignment
3. **Architecture oversight:** to provide the teams with architecture principles and standards to guide solution design and support in decision-making.

After a brief discussion, they agree to work together for the next two weeks to flesh out these three key areas. Since Peter has already been given many other tasks for the upcoming week, he decides to focus only on the first core area in the next week. He will take on the other two core areas later.

Architecture planning

In the area of architecture planning, Peter wants to integrate business and programme management more closely with the Architects. He contacts a friend who works at another company and also is familiar with agile programmes. After a short phone call, his friend sends him an overview of how architecture work is embedded in large agile settings at his company.

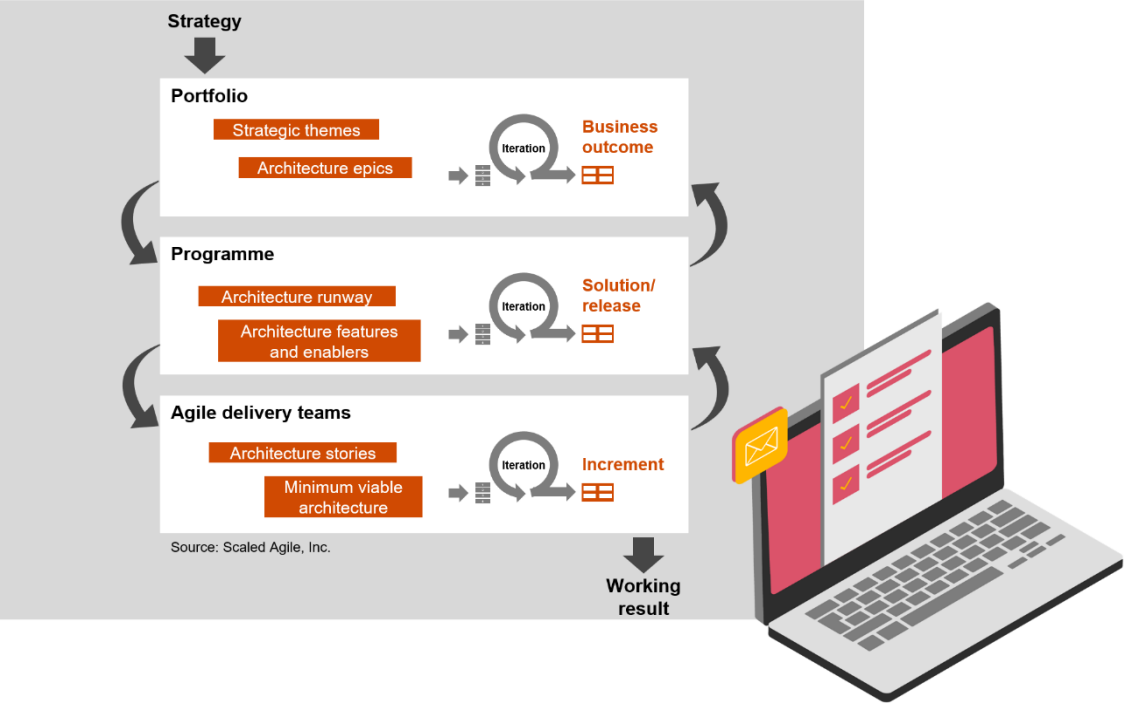

Figure 3: Architecture levels

Together with his consultant Hanna, Peter reviews the received illustration and its underlying concept.

- **On the portfolio level**, Enterprise and Domain Architects contribute to business/IT alignment. They support end-to-end value streams by translating the enterprise strategy into relevant strategic themes and architecture epics.
- **In different programmes**, the Domain Architects plan and refine the architectural runway by defining architecture enablers and developing minimum viable architectures for the delivery teams. This is done jointly with product management to ensure fit-for-purpose architecture solutions for the planned business features.
- **In collaboration with agile delivery teams**, the Solution Architects define stories to incrementally realise the defined minimum viable architectures. They contribute best practice, lessons learnt and standards.

Peter feels that his idea of increasing the architecture involvement in business strategy discussions is validated by this concept. By applying this approach, early interaction of the Programme Architects with business and programme leadership is encouraged. The business requirements and priorities can be used to steer architecture work, identify dependencies and derive risks.

Consequently, to make it tangible and transparent to all levels and teams as quickly as possible, he instructs Hanna to draft a proposal to transfer this structure into the existing Kanban board of the Butterfly Programme. He is aware that this will only be a first step towards enabling this new structure. Establishing the architecture planning concept requires buy-in from business management, the Architects and change management to ensure operationalisation.

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