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

Introduction: Why is Architecture important in large-scale agile environments?

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PwC supports various client organisations in their digital transformation journeys. Many of them are conducting these usually large transformation programmes with some kind of scaled-agile delivery approach. While the actual IT delivery within the development teams is usually based on Scrum, each client comes up with surrounding structures, processes and ceremonies to organize and direct the individual teams towards the programme targets.

Although there has been some discussion on whether Architects are needed anymore in agile organisations (Scrum does not recognise such roles), in agile enterprise settings there is still an incremental need for architecture management. As in the past, an Enterprise Architect can provide support for:

- the alignment of business strategy, business processes and capabilities and their implementation in the application, data, integration and technology landscape;
- navigating complex enterprise IT landscapes with different business domains and manifold IT systems around the globe;
- understanding and resolving dependencies between different teams and IT solutions;
- managing the technology portfolio within the programme and in compliance with corporate standards.

That is why we believe that Enterprise Architecture Management still has a major role to play in agile transformations. Moreover, we are convinced that an Enterprise Architect is best positioned to support agile leaders in stepping up agile initiatives to go from delivering IT solutions to continuous innovation.

Key topics

Based on practical experience in such transformational environments, we would like to present a few perspectives in this story-based article series:

1. **Agile architecture frameworks need to be adopted and amended for practical use:**

Existing scaled-agile frameworks are often too generic and abstract when it comes to explaining how architecture development and management works (see figure below). This is why, once adopted, our clients usually customise and or amend these frameworks to their needs.

	SAFe®	The Open Group Open Agile Architecture™	Disciplined Agile® Architecture	Architectural Thinking
Key content	• The key principle of intentional architecture and emergent design • Lays out architect roles in SAFe and involvement of architecture in its ceremonies (e.g. Increment Planning) • Concept of the architectural runway and architecture enablers	• Covers the Digital and Agile Transformation • "Core" part introduces many relevant concepts (e.g. development building blocks, governance etc.) • "Building blocks" part elaborates further on many trending concepts (e.g. Domain-Driven Design) with approaches and examples	• Agile EA is part of the process blade of the Disciplined Agile® toolkit • Describes architecture roles, their embedment and interactions with other disciplines	• Uses a lightweight architectural model based on business capabilities and value streams • Provides a collection of very business-focused architecture maps and principles
Strength & weakness	+ Very well integrated into SAFe's agile concepts and processes, which have already been adopted by some companies − However, not very specific and actionable when it comes to the agile architecture work itself	+ Comprehensive collection of architectural approaches covering different perspectives (strategy, design, implementation and governance) − Partially text-heavy; likely too extensive and theoretical for easy adoption by non-expert readers	+ Provides clear principles and focus points for agile architecture work (e.g. with stakeholders and development teams) − Rather conceptual and less process-focused than e.g. SAFe; also missing details for practical implementation	+ Very lean approach which tries to focus on key topics with relevance and value for the business − Still in development: currently lacks implementation guidance; the minimalistic approach might be too simplistic for complex enterprise settings

Agile architecture frameworks

Figure 1: Agile architecture frameworks

2. **Architecture management in agile transformations is complex and needs clear processes and organisation:**
Agile transformation programmes in large corporate settings usually operate on the existing IT landscape (brownfield) and need to deal with its complexities and legacies. Due to their scope, they usually touch multiple business domains and IT platforms. Hence, a couple of Architects "thrown into" the delivery teams is not enough. Architecture work needs to be organised within the transformation programme - sometimes across several management levels - to manage inter-programme dependencies and activities towards a common goal. And it has to connect with the surrounding enterprise architecture and corporate governance so that it can be embedded into the overall landscape.

3. **Agile architecture development needs to happen in the teams, synced to their cadence:**
Enterprise Architects that "visit" agile teams once a week and "dump" their

target architecture and two-year roadmap are rarely, if ever, successful. For successful architecture development, the architecture work needs to be embedded into the agile delivery process. It needs to blend into the agile ceremonies and follow the heartbeat of the transformation programme. In this white paper series, we would like to present some of the different approaches and tools for supporting this agile architecture working-mode.

4. **Enterprise Architects should develop from "IT Orchestrator" into "Technology Innovators":**
   In many technology-driven companies, IT has developed from a cost factor and asset into a business enabler. Hence, Architects need to step up their game, not only to highlight how business capabilities can be implemented but also to advise the business on new, relevant technology trends and how they can be applied drive innovation in the business. With their broad knowledge about the business and IT of their respective companies, we believe that Enterprise Architects are well positioned to be strategic advisors for their business leaders.

In the following articles of this story-based series, we would like to present our insights into successful agile architecture management in the form of a fictional story inspired by several client engagements. Let us first introduce the setting…

Meet Peter, Lead Architect of the Butterfly Programme

Peter is Lead Architect of the Butterfly Programme, a large-scale IT transformation of one domain and he is responsible for its business and IT Architecture development. Historically, projects in his company were planned and executed waterfall based. With the current high market pressure and the increasing speed of technological innovations, the company decided to run the Butterfly Programme with an agile approach.

After a few months of working in the agile setting the monthly management status meeting takes place. The mood is noticeably tense when the programme lead Maria (who is also Peter's boss) announces that the MVP functionalities for the users cannot be released as planned because important dependencies in two work streams had not been identified and resolved in time. She urges all participants to look actively for solutions to avoid similar issues in the future.

On his way home Peter starts thinking about the programme's unfavourable situation. After some time, he realises that the shift of the release will probably not be the last one if they do not implement fundamental changes. Across the programme as a whole, teams are developing features quickly but they do not adequately plan for cross-team integration and tests along end-to-end processes or for cross-functional topics like security and monitoring. Their designed architecture solutions are neither transparent to other teams involved nor to the business. Furthermore, the Architects in the teams are generally too busy with day-to-day tasks and not sufficiently involved in overall strategic business and IT decisions.

Peter is tired of the firefighting mode they are in right now and the reactive way of working. He

realises that the "real" architecture work has been neglected in the agile environment. After a few days he sends an email to Maria putting forward his concerns. He presents her with four areas of improvement which he has formulated as questions. By answering these questions, he intends to achieve an improvement in the programme's architectural organisation, processes and governance concepts in order to integrate the architecture into the scaled-agile programme more effectively and strengthen its position.

- **Part 1:** What should the organisational structure of Architects in large-scale agile programmes look like?
- **Part 2:** How is agile architecture development supposed to work?
- **Part 3:** Which processes can promote collaboration between agile delivery teams?
- **Part 4:** How can architecture decisions be reached quickly and efficiently?
- **Part 5:** How can Architects be more deeply involved in the business strategy to establish IT as an enabler?

To be able to work on these improvement areas and to be sure of using a state-of-the-art approach, Peter requests the support of external consultants. Maria is aware that to achieve the best results and compete successfully in the market external input is indispensable. She accepts his approach but also advises him to use well-known agile frameworks as a basis.

In the following articles we will follow Peter on his journey optimising the current architecture setup within the large-scale agile programme.

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