BUSINESS AGILITY WHITE PAPER

SAP Delivery Agility – Applying Essential SAFe® to Large-Scale SAP Implementations and Operations

TABLE OF CONTENTS

ABSTRACT

SAP has announced that starting at the end of 2025, it will suspend maintenance of its business suite applications as clients move to the cloud-based SAP S/4 HANA. That means for successful organizations, it is more than a system upgrade. Organizations will have to extract maximum value from new technology by first understanding its potential impact on their operating model, processes, and customers. They will also potentially have to transform end-to-end value streams to achieve a higher return on investment with SAP delivery agility. SAP delivery agility is a competitive imperative in dynamic, complex situations. It provides critical core systems to lay the foundation for business agility. This enables business to run smoothly and delivers better economic outcomes by harnessing the power of disruption to lead with speed, confidence, and innovation. Accenture has helped over 600 Agile-based SAP engagements to successfully accelerate large-scale SAP implementations, leveraging leading edge Lean-Agile delivery approaches. This white paper introduces the minimum integrated business process concept and 10 Scaled Agile Framework (SAFe) Essentials that are at the heart of SAP delivery agility and should be mastered for SAP S/4HANA implementations and operations to win in today's market.
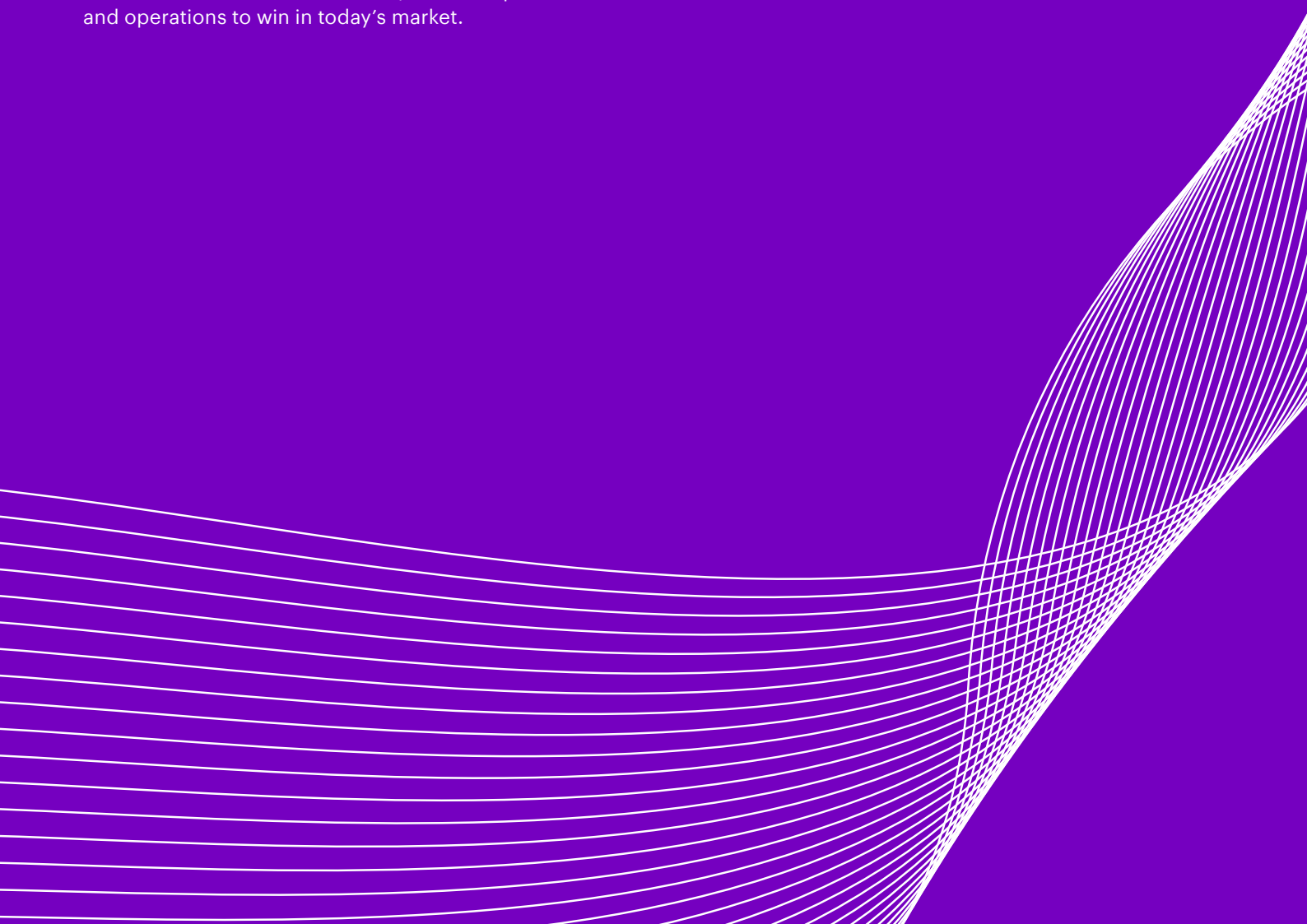
01
INTRODUCTION

Digitization is shifting from a differentiator to a survival capability.[1] The lifespan of a Fortune 500 company has decreased from 75 to 15 years.[2] At the same time, new and emerging technology developments are resulting in uncertainty that forces organizations to quickly respond to rapid market changes.[3]

THE COMMON THINKING THAT ERP SYSTEMS ARE TOO LARGE, TOO COMPLEX, AND TOO DIFFICULT TO TRANSITION TO AGILE IS PREVALENT AND REQUIRES A MAJOR PARADIGM SHIFT.

Enterprise technology platforms are challenged by the introduction of lightweight capabilities and architectures to be responsive to digital transformations. SAP shifts toward cloud-first and anticipates the Intelligent Enterprise with SAP HANA-related services being the fastest growing segment.[4] Although SAP services are still dominated by on-premise, application-related project services, the growth rate is slowing down due to increasing adoption of cloud related services.[5] Organizations must master their internal transformations of existing operating models to keep pace with the rapid technological advancements and, at the same time, respond to changing market developments to be innovators and disruptors themselves.

This situation – in which the system shifts over time – is characterized by dynamic complexity, which means when you make one change, this change will affect the behavior in a different part of the system.[6] In large-scale SAP implementations, this is the predominant situation, with constant changes in technology, systems, people, and business requirements.

SAP delivery agility is designed to harness the power of dynamic complexity. Research shows that 92% of executives have recognized this capability as critical to business success.[7] More importantly, there is a strong correlation between an organization's Agile maturity and its financial performance.[8] SAP delivery agility contributes to business agility by continuously optimizing the shortest sustainable lead time of business process implementations and changes for increased predictability and speed.

Although the drawbacks of implementing an ERP using a phase-gate process are known, transitioning into true scaled Agile delivery remains rare. Gartner research shows enterprise leadership often has limited knowledge and experience in how to apply Lean-Agile principles and practices to implement and operate ERP solutions.[9]

There are organizations already applying Agile in ERP implementations successfully, even though the available literature and shared body of knowledge of their experience is still very limited. Accenture has helped over 600 Agile-based SAP client engagements[10] to successfully accelerate and execute large-scale ERP implementations, leveraging leading-edge Lean-Agile delivery. The common underlying elements of these successes provide recommendations on how future Agile ERP implementations can be delivered better. These proven practices can be summarized along three key dimensions:

1. **Plan and organize work for delivery within a regular development rhythm – a cadence, leveraging cross-domain capable teams scaled for efficiency to reduce hand-offs and improve productivity.**

2. **Visualize work and dependencies, with a focus on limiting work in process (WIP) to reduce delays and improve productivity due to less task switching.**

3. **Accelerate automated testing to reduce transaction costs and improve quality.**

SAFe accompanies such large-scale enterprise transformations to Agile and provides the 10 Essential Elements that allow complex and large enterprise solutions to succeed on their journey towards delivery agility.

This white paper gives an overview of SAP delivery agility by focusing on a minimum integrated business process and 10 SAFe Essential Elements in SAP S/4HANA implementation.

TRANSITIONING TO AGILE REQUIRES A MAJOR MINDSET SHIFT, UNDERSTANDING OF PRACTICES, AND THE UNDERLYING REASONS.

02
SAP DELIVERY AGILITY

2.1 WHAT IS DELIVERY AGILITY AND WHY IS IT IMPORTANT?

Business agility is fundamentally tied to the ability to deliver high quality quickly and responsively. This is what we call SAP delivery agility. We identify three indicators of SAP Delivery Agility: The ability 1. to build high-quality technology, 2. to deliver fast and responsively, and 3. to thrill users.[11]

This means utilizing automation with close to zero escaped defects, for example. Leadership must ensure to evolve their organization beyond SAP delivery agility to adapt to recent market changes and SAP developments. Business agility enables enterprises to become learning organizations that improve continuously. Their success is fueled by passionate, empowered employees. Business agility comprises several critical organizational capabilities:

1. **Deliver fast and responsively (delivery agility)**

2. **Innovate and disrupt (product innovation)**

3. **Adapt organization and culture (organizational adaptability)**

4. **Manage complexity (leadership effectiveness)[12]**

The question is: Why does SAP delivery agility matter for an organization using SAP ERP software? By 2025, the maintenance support will end for SAP Business Suite 7 core application, and a migration to SAP S/4 HANA is required to leverage the benefits of SAP S/4 in conjunction with SAP HANA.[13] Organizations using SAP ERP software without the SAP HANA database will need to adapt and be ready

for this change. SAP delivery agility is an essential, continuous transformation craft that must be learned. Time is running out for organizations that have not yet started the journey.[14]

Traditionally, complex SAP implementations have encouraged the use of phase-gate processes to manage scope, time, and budget risks. This process found typically more value in setting fixed requirements upfront and correcting deviations from plan rather than incorporating learning outcomes and feedback from business to iterate to the optimum SAP solution.

Now, the industry is moving towards product-oriented thinking where all people and systems that contribute to a solution, work together in a value stream (see figure 1). This new operating model already exists in SAFe. Teams of teams are built around value streams, which can bring business, corporate functions, and IT as well as implementation and operations together.

A closer partnership between business and IT can be achieved through running your IT shop like a business, not like a cost center, "[...] which results in faster and better business value through alignment with the strategy and goals of the enterprise".[15]

The following chapter introduces the minimum integrated business process concept, which is a basic prerequisite for SAP delivery agility that enables business agility.

Figure 1: Value Stream
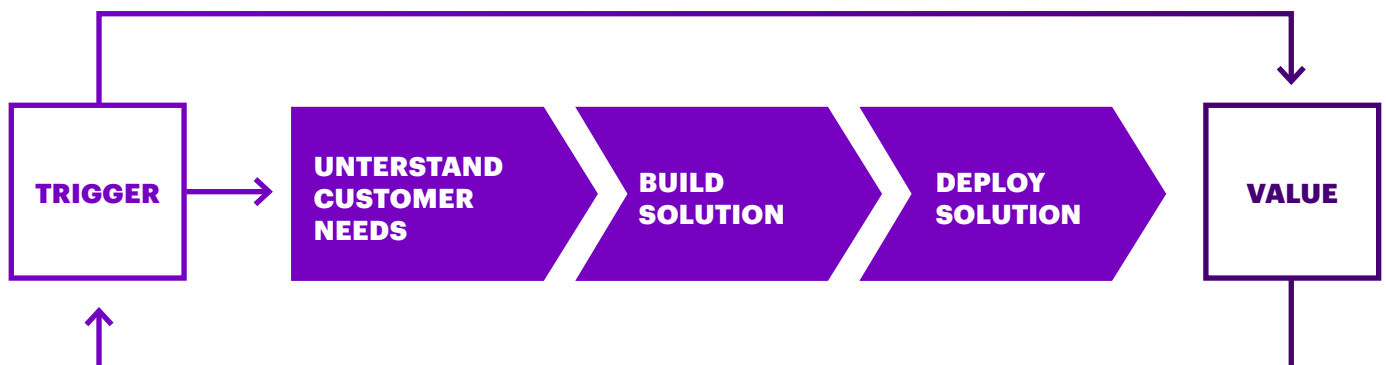
2.2 THE MINIMUM INTEGRATED BUSINESS PROCESS

The first step is identifying the problem that needs to be solved. The minimum viable product (MVP) is defined to start the empirical process control of validated learning as soon as possible.[16] In SAP, the minimum integrated business process usually incorporates the legally required processes, people, policies, and systems to run the business from customer request to value. Validated learning informs the business when to stop or grow with maximum acceleration.

The minimum integrated business process can run independently in production and represents the "happy path" without major developments (WRICEFs) to achieve validated learning as fast as possible. This involves telemetry that must include actionable metrics to demonstrate cause and effect relationships in terms of the minimum integrated business process and business value. The concept helps develop the system iteratively and incrementally to reduce time, budget, and scope risks.
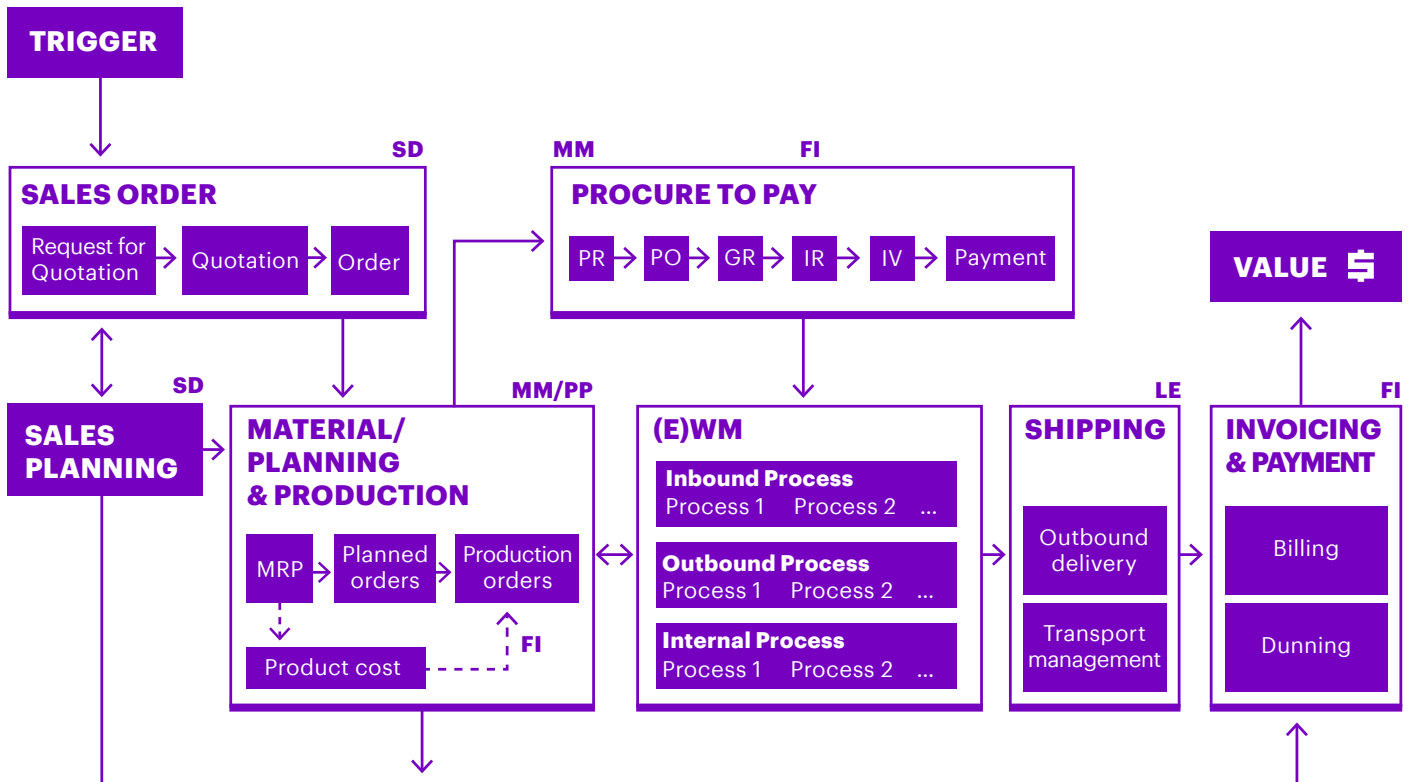
Assessing business processes focused on customer centricity and growth helps isolate root causes of complexity so that the business can simplify these to realize the full value of the digital journey. Some companies are doing this "journey mapping," but fail to put the customer journey in the context of end-to-end business processes. This impedes uncovering bottlenecks and providing real outcomes for customers by way of goods, services, and experiences. To avoid this, start by identifying the required outcome for the organizational growth agenda. Once a business understands the full set of interdependent activities required to deliver a business value, it can use analytics to review each activity through various factors, such as number of systems, FTE allocation, and critical path.[17]

The minimum integrated business process is a way to focus on both sides – business and technology. Business has the ability to adapt its needs based upon validated learning of working business processes. It is still minimal enough to get to a first result as quickly as possible. This is the closed feedback loop which, if shortened, can help get and incorporate fast customer feedback and enable enterprises to react to changes quickly. A minimum integrated business process can be re-evaluated and adapted whenever priorities change due to unforeseen market developments or business opportunities.

Establishing process owners is important for the minimum integrated business process. They are accountable for customer-centric business value, a clear line of accountability for all aspects of process management (process, people, policies, systems), and an ownership mindset is facilitated. When it is time for ERP transformation, these process owners will be accountable for the minimum integrated business process, including system configuration, implementation, and adoption. During the execution of business process transformations, the goal is to maximize business ownership to be ultimately accountable of its results.

The concept is a basic prerequisite for SAP delivery agility that enables business agility. The next chapter will introduce the 10 SAFe Essential Elements for SAP implementations and operations to master SAP delivery agility.[18]

Figure 2: End-to-end Value Stream Example

TRIGGER

SALES ORDER — SD
- Request for Quotation → Quotation → Order

PROCURE TO PAY — MM ... FI
- PR → PO → GR → IR → IV → Payment

VALUE

SALES PLANNING — SD

MATERIAL/ PLANNING & PRODUCTION — MM/PP
- MRP → Planned orders → Production orders
- Product cost — FI

(E)WM
- **Inbound Process** — Process 1 Process 2 ...
- **Outbound Process** — Process 1 Process 2 ...
- **Internal Process** — Process 1 Process 2 ...

SHIPPING — LE
- Outbound delivery
- Transport management

INVOICING & PAYMENT — FI
- Billing
- Dunning

03
APPLYING ESSENTAL SAFe TO SAP

Most line organization design is based upon functional silos. Their prescribed waterfall delivery methodology prevents the success of adopting delivery agility and derails efforts to eventually achieve business agility. Siloed component teams develop their distinct part of the solution and are reliant on quality assurance (QA) to test code late in the development. An estimated 50 percent loss of knowledge is suffered at each hand-over point, from analysis, design, build, test, and deployment. Furthermore, about 20 percent productivity loss is suffered due to task switching.[19] Excessive up-front planning and fixed project management triangle parameters (scope, time, budget) leave little room for innovation and business-value-focused changes.

Organizations must first change their practices in order to drive the cultural change needed for a sustainable trans-formation toward delivery agility. According to the 13th annual State of Agile Report, "organizational cultural issues and lack of skills or experience with Agile methods remain the leading impediments to adopting and scaling Agile."

To overcome these hurdles and realize the full benefits of a scaled-Agile approach to SAP, it is vital to incorporate the 10 Essential Elements of SAFe and adopt them to large-scale SAP implementations.[20]

10 ESSENTIAL ELEMENTS
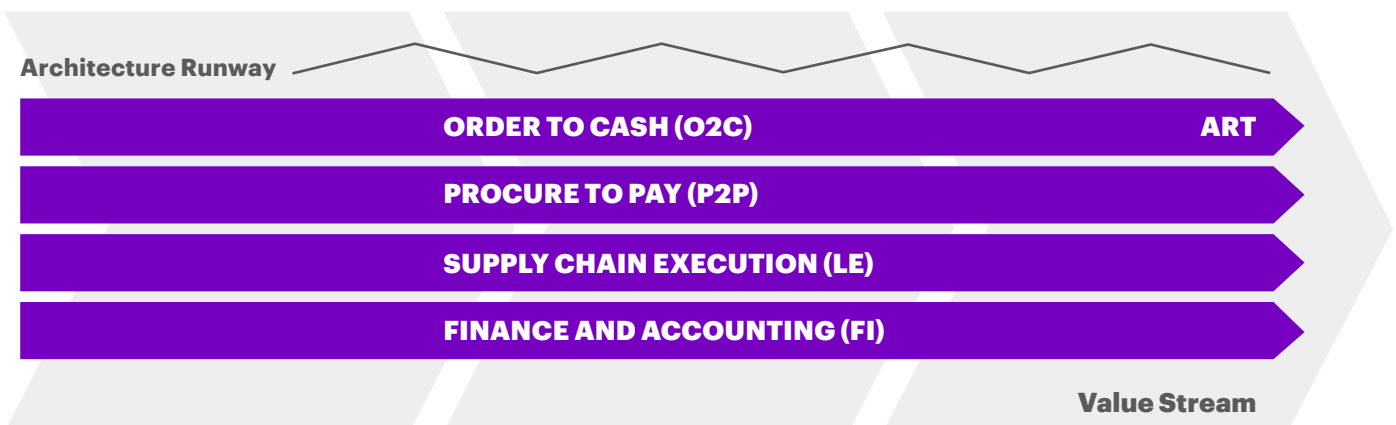
#1 LEAN-AGILE PRINCIPLES

Lean-Agile principles and systems thinking form the foundation of SAFe and are encapsulated in nine principles. Organizations must understand these principles, align them with their business goals, and address the specific challenges of their SAP system implementations before they can reap the inherent benefits of an Agile transformation. The complimentary combination of Lean-Agile and systems thinking focus on measuring value creation in terms of the shortest sustainable lead time and continuous improvement.

Agile strives for short planning cycles and fast value delivery with the customer in mind. This is exemplified in the fourth principle, "build incrementally with fast, integrated learning cycles", which enables an organization to react to new insights or knowledge gained during an iteration. The concept of iterative and incremental development addresses the fact that most products cannot be defined right up-front nor built perfectly. It promotes developing just enough so that it can be improved and expanded upon once more knowledge is accumulated empirically. The minimum integrated business process concept, where we

first focus on configuring a minimum integrated business process and then expand with developments (WRICEFs), applies this principle. Lean encourages a systems view based on an organization's value stream from concept to cash. It focuses on achieving the shortest sustainable lead time. The focus on flow of value instead of utilization of resources, continuous elimination of waste such as delays, and batch size reduction are at the heart of Lean. Furthermore, the focus on having WRICEFs and configurations split into smaller batch sizes allows work to move through the system faster to gain real insight, higher predictability, and speed. Both Lean and Agile mindsets emphasize the importance of quality, continuous improvement, and flow.

Applying SAFe's Lean-Agile principles to SAP to deliver a smoother-running business and better economic outcomes requires a substantial change in core beliefs and values. The essential skills can be gained through experience, training, and coaching – enabling organizations to apply the Lean-Agile mindset with systems thinking.

Figure 3: E2E Business Operation Solution Train Example

Architecture Runway

ORDER TO CASH (O2C) · ART

PROCURE TO PAY (P2P)

SUPPLY CHAIN EXECUTION (LE)

FINANCE AND ACCOUNTING (FI)

Value Stream

VALUE STREAM	E2E Business Operation Solution Train
CUSTOMERS	Large Scaled S&P 500 companies (B2B)
TRIGGERS	Customer Request
VALUE FOR CUSTOMERS	Good Delivery
VALUE FOR ENTERPRISE	Revenue Realized

#2 REAL AGILE TEAMS AND TRAINS

Business customers and developers must establish an ongoing dialogue at an early stage to keep the program on track. The cross-functional and self-organizing teams use exploration enablers whenever there is a lack of clarity on functional and technical approaches. New technologies or dependencies need to be examined, or feasibility and risks need to be established.

Agile Teams should have all the tools and skills to perform the software development steps (define, build, test, deploy) within one iteration to deliver a working increment of value. There can be varying degrees to cross-functional skills in a team. The highest degree of cross functionality is found in feature teams that typically run using Scrum to optimize flow. Component teams, such as SAP Technical Architecture, on the other hand, typically run using KANBAN and are optimized for technical and functional robustness. Agile Teams should not exceed a certain number of people due to the cognitive load limitations and increasing complexity in communication; 5-11 people is SAFe reccomended Agile team size.
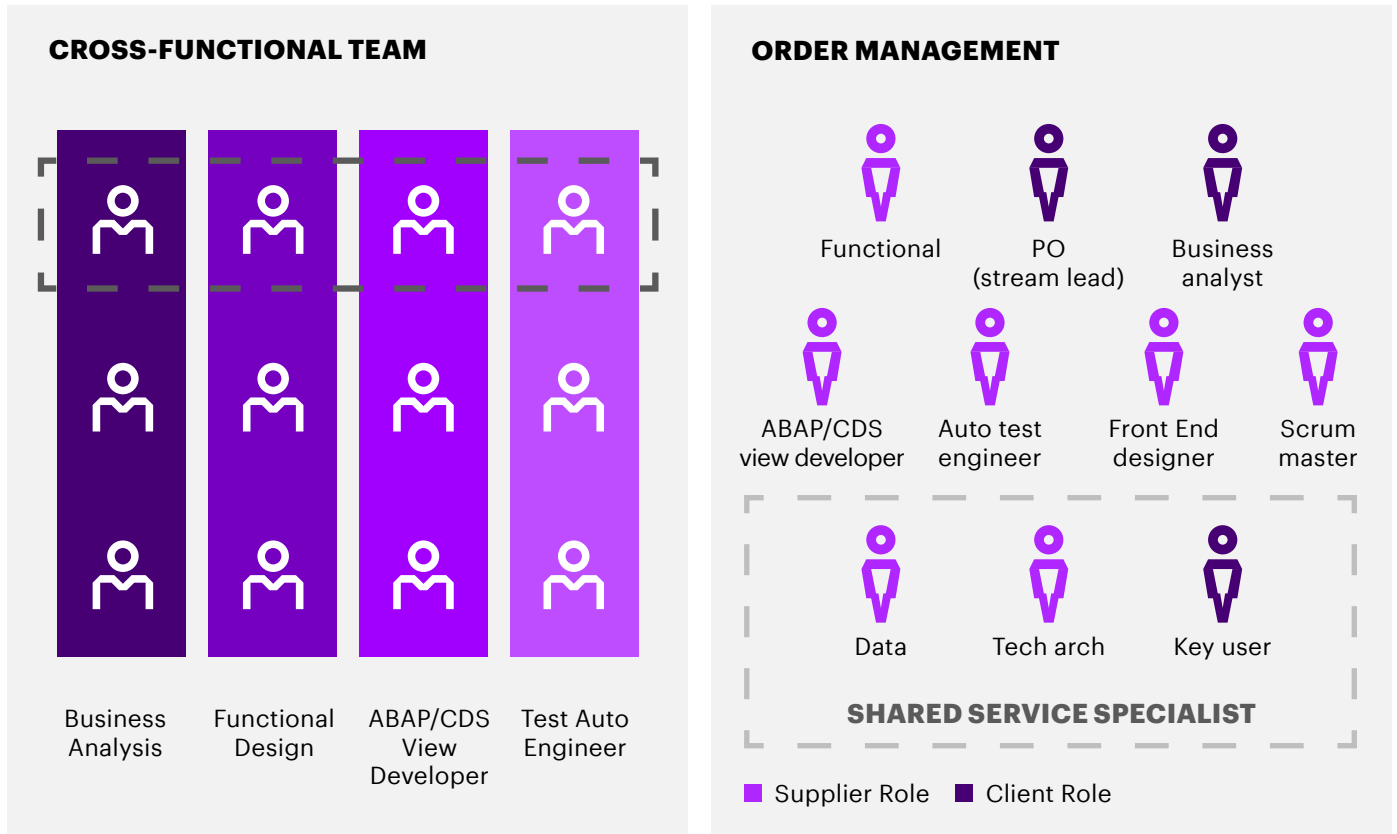
The key attributes of an SAP Agile Team are close to those of non-SAP Agile Teams. They are mostly set up as feature teams, for example, involving a key user, who is a key liaison to the line of business and ensures early business buy-in while providing frequent business feedback. Another difference is SAP specific specialist roles such as SAP basis, SAP TA, or Data migration.

A data conversion subject matter expert is embedded in the team to prepare for test data and data migration as well as to liaise with the master data management team, which is typically a component team. From experience in Agile SAP programs, it is recommended to include data migration experts in functional feature teams to avoid wasteful dependencies and thereby reduce delays. This helps realize the "you build it, you ship it" paradigm and applies a Lean approach to build it incrementally for the required data quality for the go-live. The data sets for migration testing within the template build phase should be defined early and discussed with stakeholders for increased predictability.

Agile Team tests regularly and continuously and increase automated unit, functional, and end-to-end scenario tests to avoid waiting times and waterfalling iterations. Even though most system requirements are defined at the beginning, new or changed requirements and ideas are continuously integrated and refined in the backlog so that the teams can identify potential issues in advance and plan for the next program increment accordingly. This is reflected in Essential Elements #4 PI Planning and #9 Architectural Runway.

DATA CONVERSION SUBJECT MATTER EXPERTS SHOULD BE PART OF AN SAP AGILE TEAM, WHILE SHARED SERVICE SPECIALISTS CAN BE PULLED FOR EACH ITERATION.

Figure 4: SAP Agile Team Example

CROSS-FUNCTIONAL TEAM

| Business Analysis | Functional Design | ABAP/CDS View Developer | Test Auto Engineer |

ORDER MANAGEMENT

Functional | PO (stream lead) | Business analyst

ABAP/CDS view developer | Auto test engineer | Front End designer | Scrum master

Data | Tech arch | Key user

SHARED SERVICE SPECIALIST

■ Supplier Role ■ Client Role

Large-scale SAP development efforts normally require hundreds of people working collaboratively on the delivery of a solution. But teams are assigned to build only their part of business processes. SAFe groups multiple agile teams into an Agile Release Train (ART) and multiple ARTs into a solution train.

Figure 5: ERP Solution Train Example
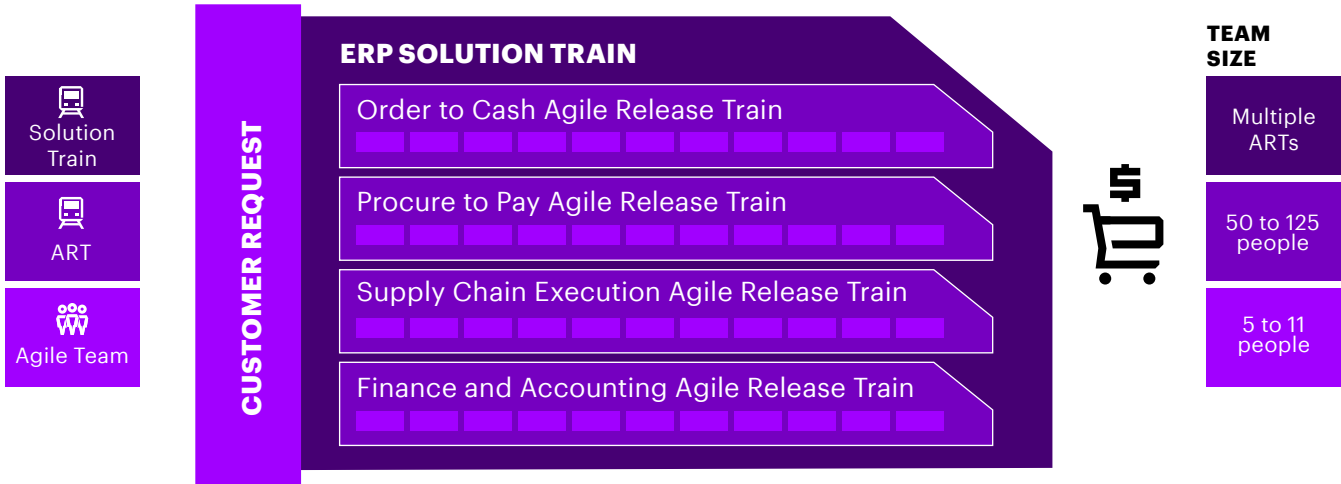
#3 CADENCE AND SYNCHRONIZATION

Large-scale SAP implementation usually involves hundreds of people who are grouped into multiple Agile Teams. Cadence ensures a rhythmic pattern that Agile Teams follow to bring predictability and cost coordination. Synchronization allows multiple Agile Teams and stakeholders to integrate, align, and understand business, IT, and key users' perspectives.

SAFe requires multiple teams to work with the same cadence, frequent synchronization, and periodic cross-domain planning to reduce uncertainty to a single interval and ensure systems are developed as desired.[21] An SAP implementation can use the recommended Program Increment (PI) length of 10–12 weeks to establish a regular development cadence.

It is important that Agile teams – both component teams, typically using KANBAN, and feature teams, typically using Scrum – should share the same cadence and synchronization regardless of which approach they are using at team level.

Even with a Lean-Agile approach, it is recommended to first define the ways of working, provide the necessary training and coaching, align on key design decisions and dependencies, set up the SAP environment, and enhance the business case. Experience shows that SAP programs need dedicated time for preparation before the template build phase begins, especially for those with critical dependencies that require strategic decisions or the adoption of new technologies and delivery paradigms where SAP is new for the organization. Creating a culture of transparency, decentralization, engagement, collaboration, and accountability, visualizing work, and the use of a light-weight work management system will help Agile Teams better plan and point out bottlenecks and dependencies on program boards and align around cadence and synchronization.

#4 PI PLANNING

When dealing with complex and highly integrated systems and business process like SAP, having a dedicated event to align and plan the release on a regular basis can make a significant impact, especially on decision making and risk management, dependencies, and predictability. Program Increment (PI) Planning for single Agile Release Trains (ARTs) is a big room planning event where everyone in ARTs participates and directly relates to cross-domain planning as introduced in Cadence and Synchronization. It presents the chance to plan the next ten or twelve weeks in only two days and aligns 50 to 125 people under a common vision on what business processes should be built and when.

PI Planning requires preparation, collaboration, and commitment from all teams and key stakeholders involved in a Program Increment. During PI Planning, teams identify and resolve interdependencies, plan for the upcoming iterations, mitigate risks, make quick decisions, and commit to their PI objectives based on the program vision, roadmap, and prioritized list of work packages (features). Decisions are made about what business process will be built during the PI and when this process needs to be ready for release (minimum integrated business process).

The first stage of PI planning can be done after the ART launch (first 12 weeks after kickoff), where events such as value-stream mapping, fit/gap analysis, and setup of organization structure and basic setting are conducted. Fit/gap analysis should not be a one-time activity at the beginning (big design upfront) but rather a continuous process.

Having fit/gap analysis during refinement of capabilities and features (business processes that can be implemented in less than 10 weeks) informs the teams whether standard SAP processes are sufficient to fit the company's needs or if there is a gap that needs to be filled by new development or configuration that must be planned during the subsequent PI Planning.

The presence of business owners and stakeholders is a must for building alignment with the teams on a common and committed set of deliverables ranked by business value and tolerated risk exposure. Risk displays include the following factors:

1. **Schedule risk:**
   Risk of not meeting a given milestone

2. **Cost risk:**
   Risk of exceeding the allocated budget for delivery of the business process

3. **Functionality risk:**
   Risk of a non-working business process

#5 DEVOPS AND RELEASABILITY

The faster and more frequently an organization delivers value to its customers, the sooner it can validate if its intended action can achieve the economic benefit in an uncertain world.
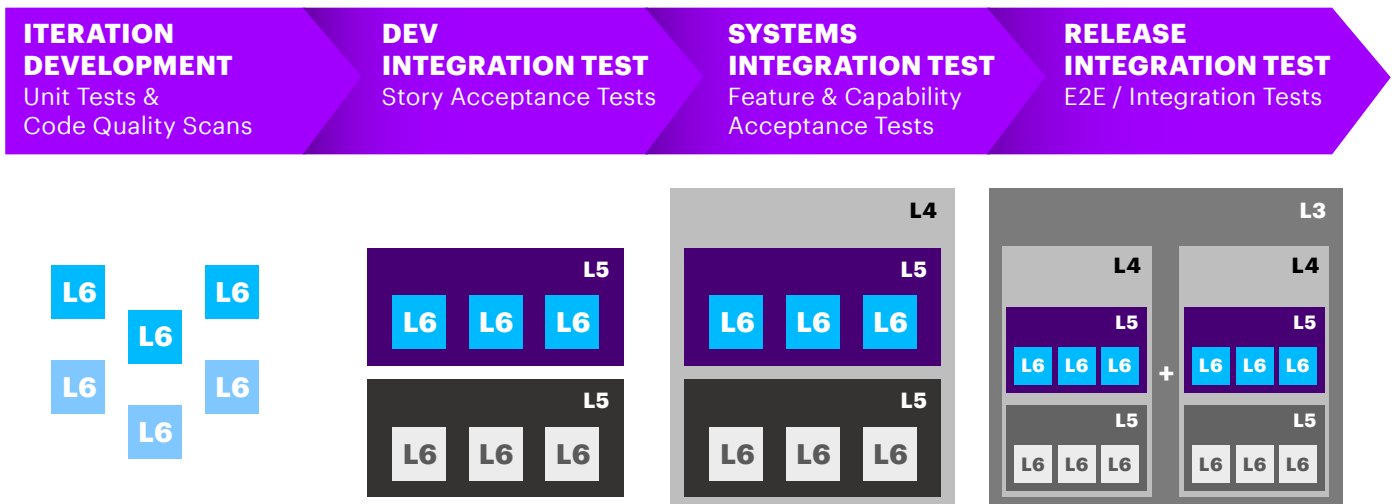
This requires a combination of technical practices, processes, and culture, which must be realized. Unfortunately, due to siloed teams (Sales, RA, CO, etc.) in SAP ERP development and operations, teams often have different success metrics and lack transparency in their progress and process:

1. **Developers have limited knowledge of the target system(s), especially about productive data.**

2. **Operations is unaware of the development status.**

3. **The development and test configurations differ from target environment configuration**.

DevOps bridges the gap from the development environment to productive operation by providing automation, integration, measurement, and recovery capabilities. It encourages the different departments involved in the delivery of a solution to work collaboratively towards a common goal – organizational success – and balance their seemingly conflicting objectives. The implementation of frequent integration and "shift-left" testing methods breaks down silos and drives early defect detection.[22] The replacement of the majority of manual processes by a continuous delivery pipeline combined with an "automate everything mindset" allow high quality and accelerated value delivery.

Improving delivery velocity requires teams to adapt to new engineering practices, process changes, and automation approaches. These are enabled by extensive automation across the lifecycle, guided by "The house of Agile Testing" as the QA frame.

Figure 6: Automate Everything Using the Business Processes as Anchor of Traceability

ITERATION DEVELOPMENT	DEV INTEGRATION TEST	SYSTEMS INTEGRATION TEST	RELEASE INTEGRATION TEST
Unit Tests & Code Quality Scans	Story Acceptance Tests	Feature & Capability Acceptance Tests	E2E / Integration Tests

Test automation is most effective when applied throughout the application stack, with heavier emphasis on automation in lower solution tiers beneath the user interface (UI). Nevertheless, teams should move away from requirements as the anchor of traceability to using business processes as the link between technology components and business needs. Test automation and test management are two effective capabilities within DevOps. Multiple tools exist that cater to specific contexts and allow for accelerated delivery of business value.

SCALE TEST AUTOMATION CAPABILITY TO SUPPORT ACCELERATION AND REALIZATION OF VALUE BY THE BUSINESS, MAINTAINING A HIGH LEVEL OF QUALITY.

For SAP implementations and in relation to the minimum integrated business process concept, test automation with Worksoft Certify can easily be integrated with SAP's test management suite within SAP Solution Manager (SolMan)[23]. This combination enables organizations to visualize underlying business processes from an end-to-end (E2E) testing perspective. Applying this practice yields various benefits.

Firstly, SAP Solution Manager can be used for architectural and system-related work such as moving items from test to production environments or monitoring testing efforts. It can track items, connect to the transportation layer of any SAP system, and capture minimum integrated business processes to create an integrated release, though each minimum integrated business process could also be

released individually. Secondly, the teams are now forced to establish a cross-team collaboration culture, as the whole business process needs to be tested in an integrated way.

Worksoft Certify allows Lean-Agile teams to build automated test scripts for ideally static – often non-changing – and long-lasting processes. Those scripts aim to reduce manual test efforts significantly to free up capacities for more valuable tasks such as technical debt removal or architectural runway maintenance. Together with SAP Solution Manager 7.2, test managers can map all relevant business processes that are then automatically tested in line with corresponding cases in SAP Solution Manager. Hence, they assign them to existing test plans tailored to the up-coming release test requirements, which are ideally derived from acceptance criteria of user stories.

Finally, each script will be executed one after another without any manual interference. The results are visualized in a dashboard summarizing all successful and failed test cases. This provides quality managers and product owners with quick feedback on which features require reworking and should be delivered with the next release to fulfill pre-defined quality standards (DoD/Definition of Done). As processes are evolving and changing, Worksoft test cases must be adjusted or new Worksoft test cases have to be created. Another strength of test automation with Worksoft is that automated process tests can be scheduled as regression tests for all following releases. This results in test activities with lower costs.

TEST DATA MANAGEMENT IS AN INTEGRAL SERVICE CAPABILITY OF AN END-TO-END AUTOMATION SOLUTION.

Test data management services enable integrated test data across systems and support data on demand for databases, stubs, and virtualized services. Generating synthetic data creates realistic, high-quality data when production data is not available. It reduces effort and improves outcomes by using standardized, repeatable processes.

Figure 7: Worksoft Certify Integrated in SAP Solution Manager

Source: SAP
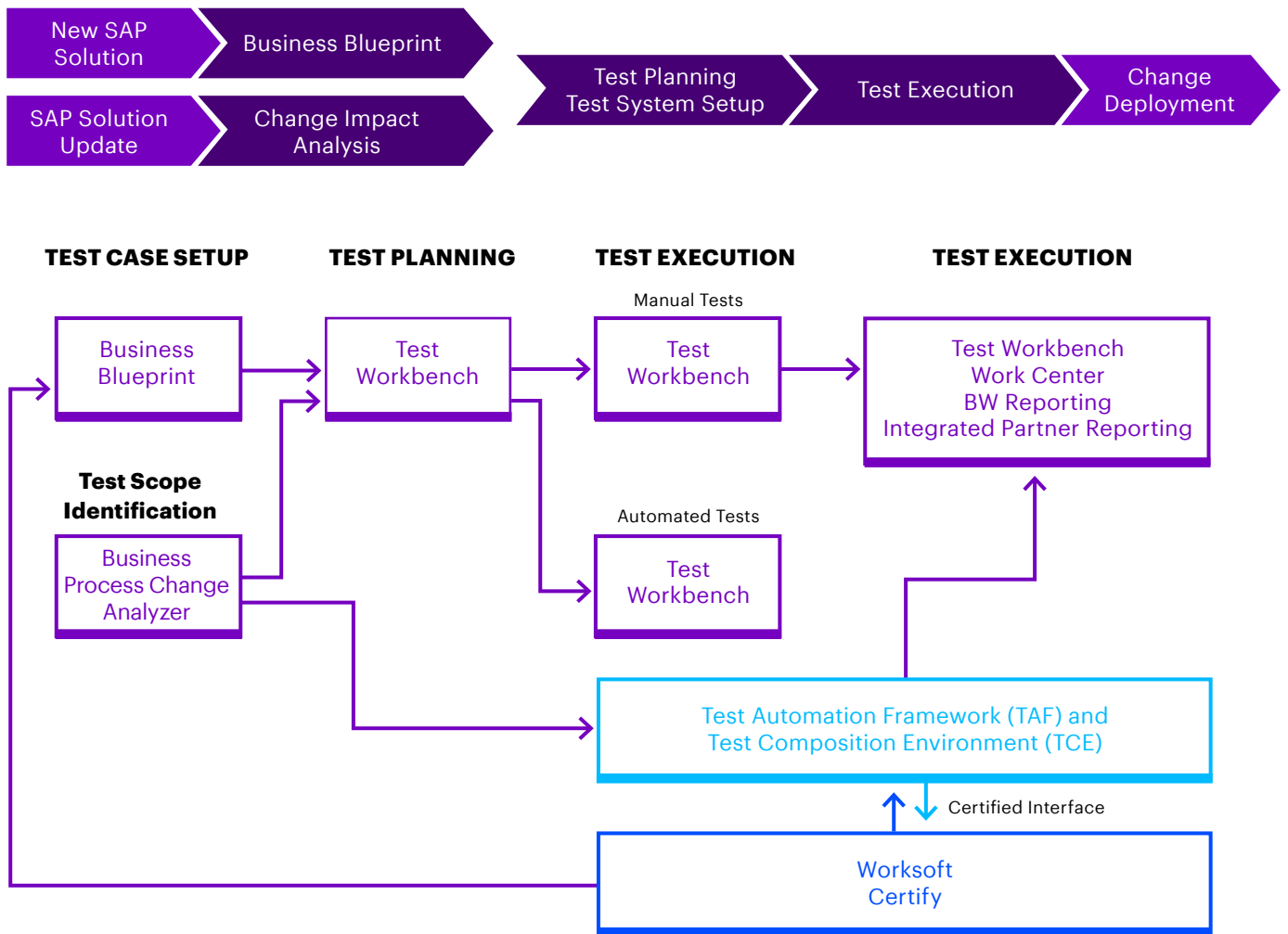
#6 SYSTEM DEMO

Lean-Agile driven development programs applying systems thinking provide regular touch points for developers, stakeholders, sponsors, and customers to collaboratively inspect and adapt the completed, integrated features, or user stories. System demo is a touch point to reality that helps steer the organization by inspecting the integrated system increment.

The primary purpose of the iteration system demo is to inspect the integrated system increment of the Agile Release Train (ART) and validate whether it is fit for purpose. Typically, the working product is showcased in the staging environment to ensure realistic conditions similar to the production environment and allow for adequate evaluation. Given the involvement of multiple teams, the system increment contains the integrated work of all teams. In SAFe, the iteration system demo takes place after every iteration. It allows the engineers to understand the economic view of the business and stakeholders and take necessary measures to keep the program on track. The stakeholders on the other hand are provided with the measure of the teams progressing towards the PI objectives.

A similar event – the PI system demo – is held by the ART at the end of each PI. In contrast to the iteration system demo, an increment is presented here that contains the developed and integrated functionalities of an entire PI.

For even larger engagements, where multiple ARTs form a Solution Train, SAFe uses the solution demo to show their jointly integrated results in a staging environment. Working software, as the primary measure of progress, and even first attempts in learning, directly influences future decisions on the value streams and portfolio level and mitigates investment risk.[24]

As WRICEFs and standard configurations are completed in the form of features during a Program Increment, a good practice is to validate and integrate short threads of larger end-to-end strings. The capability strings are demonstrated at PI boundaries to show success. Capabilities can be process-centric and can be broken down into functionality-centric features. End-to-end test data management and creation enforce process integration. For example, feature A is creating a sales order as output, which is taken as input for the next feature or capability rather than having the two features or capabilities working with independent test data.

#7 INSPECT AND ADAPT

The key to a Lean-Agile mindset is continuous improvement. Flow efficiency of ~15 percent is common across industries, which means spends ~85 percent of its lifecycle waiting for something and creating waste.[25] Consequently, Lean-Agile approaches dedicate time to addressing problems and exploring improvements based on empirical data. These opportunities are critical to increasing the predictability of the next Program Increment (PI). Several of these events happen at team level in regular intervals to ensure con-

tinuous planning and improvement. Agile Teams use the iteration planning, daily standup meeting, iteration review, and retrospective to continuously inspect and adapt. The chosen iteration length defines the frequency of those events, except for the daily stand-up meeting, and determines the degree of risk exposure. The longer the iteration, the longer the closed loop feedback cycle, and the greater the risk.

SAFe provides an additional Inspect and Adapt meeting for all teams that belong to an Agile Release Train (ART), which takes place during the Innovation and Planning iteration (IP iteration) and enables the entire program to inspect the current progress. It consists of three sub events:

1. **PI System Demo**

2. **Quantitative Measurement**

3. **Problem Solving Workshop**

During the event, the progress of implementing integrated business processes is measured by inspecting the working system that the Agile Release Train delivered in the last PI. It is imperative for program stakeholders to join the event so that they can assess whether the desired business value has been achieved with customer centricity in mind. This helps reduce risk exposure and iterate to the optimum minimum integrated business process solution to go-live.

#8 INNOVATION AND PLANNING (IP) ITERATION

The Innovation and Planning iteration is a multipurpose iteration unique to SAFe that occurs at the end of every PI. During this iteration, no development or feature delivery takes place, because the teams should solely focus on innovation and preparation for the upcoming PI and final test cycles. For example, teams can use this time for up-skilling, tooling, working on infrastructure improvements, and to resolve any defects that were missed in the previous iterations, as long as they avoid using the whole iteration for defect fixing only. If defect fixing happens frequently, this is an anti-pattern that has to be addressed in the PI Problem Solving Workshop. Furthermore, it allows developers to designate one day of the iteration to work on whatever they think will bring value to the implementation, whether it is additional training documentation for a certain

process, an irritating defect that never gets prioritized because it is not visible to the business, or any automated tests that will reduce future effort.

Additionally, IP iterations create a timebox that shifts the focus from the urgent toward innovation and helps prevent technical debt to accrue uncontrollably. The teams can use this time to effectively plan, host demos, and improve together, which fosters the creation of team spirit that leads to healthy relationships that increase collaboration.[26]

From experience, IP iterations provide essential time to conduct continuous fit/gap analysis and SAP system up-grades, and for prototyping new functionalities, such as AI, machine learning, and robotic process automation.

#9 ARCHITECTURAL RUNWAY

Organizations should leverage test automation tools to gain value and agility through quality. The speed of innovation and the ability to react to changes quickly and efficiently determines who wins in today's market. Built-in quality, one of the SAFe core values, is an integral part in the creation of the architectural runway, as it can ensure system quality, execution speed, and predictability.

The creation of an architectural runway is a prerequisite in preparing the organization for Agile, since it provides the means that enable teams to deliver the increments of value and integrate new features through the continuous delivery pipeline. An architectural runway encompasses the necessary infrastructure to deliver features without excessive refactoring. It builds the continuous delivery pipeline and supports continuous flow of value through it.

Automating most manual processes directly supports SAFe's first Lean-Agile principle: "take an economic view". It is paramount to lower the effort and transaction costs related to task switching. This achieves fast continuous integration and deployment. Essentially, it enables quick feedback, helps avoid releasing faulty software, and reduces risk exposure.

Applying Lean-Agile principles in development means to "burst the bubble" of a traditional development quality assurance approach and aspire to automate everywhere. Moving to a filtering quality management approach starts at the beginning of the development lifecycle. Lean engineering, quality assurance guided processes, and a fully automated pipeline act as the core of the quality funnel and are the true north of Agile quality management.[27]

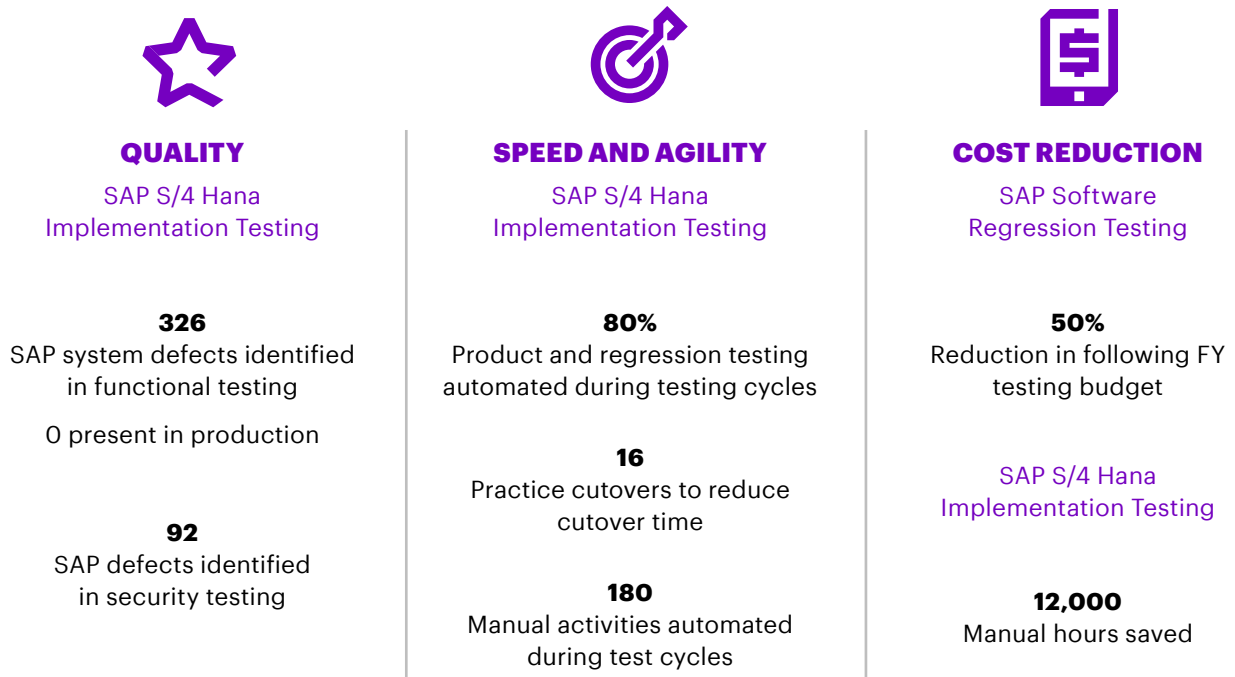**Figure 8:** A Fully Automated Pipeline Is the Core of the Quality Funnel
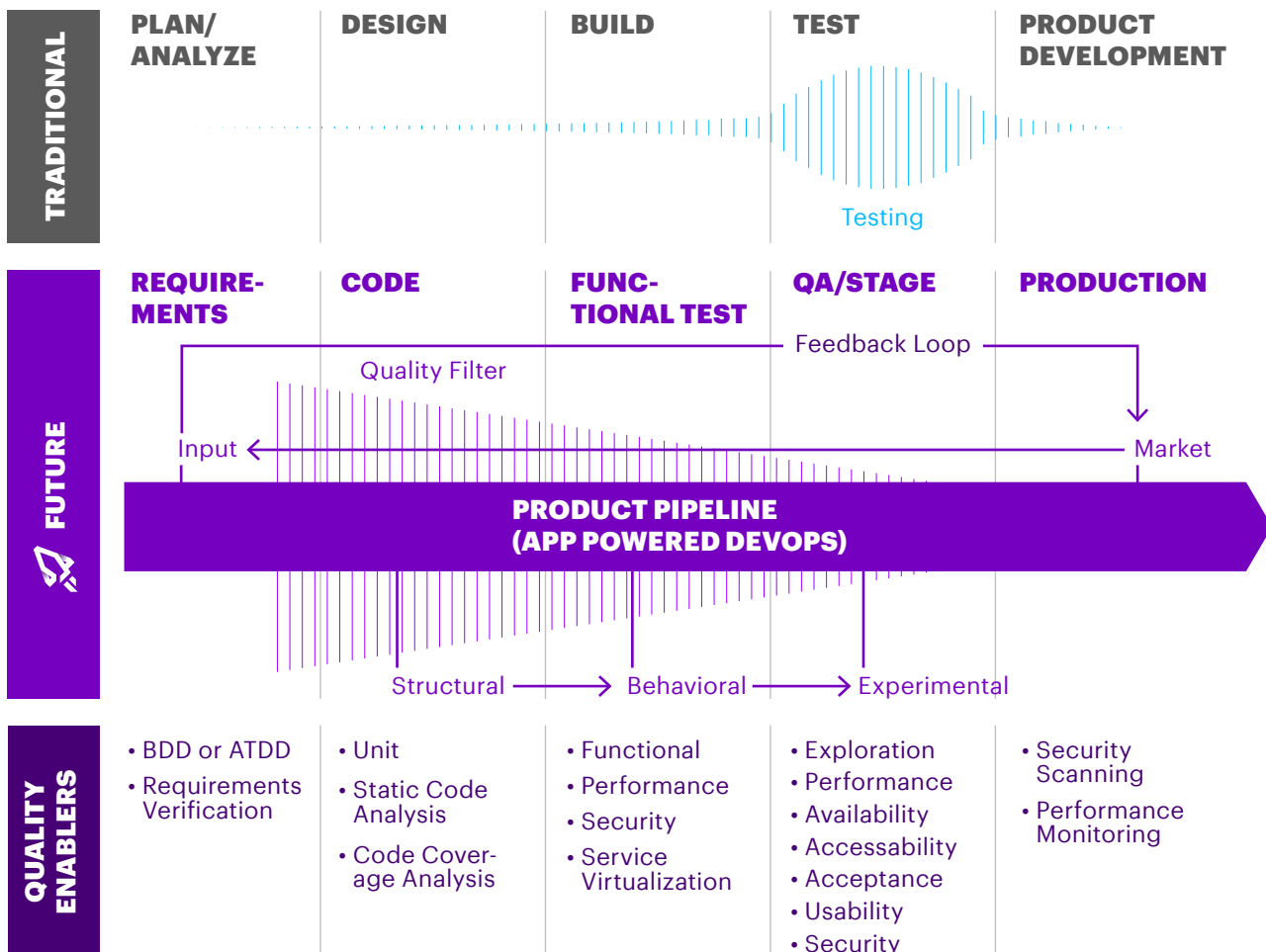
A FULLY AUTOMATED PIPELINE FROM DEVELOPMENT THROUGH TESTING TO PRODUCTION STRONGLY ACCELERATES TIME TO VALUE.

New automation capabilities enable higher software and process implementation quality and agility by automating functional security regression testing, and even the testing of an SAP S/4HANA implementation itself. Testing subject matter experts within Agile Teams and highly specialized quality engineers of system teams must change from manual to automated methods as a business priority. In turn, this leads to a decline in regression testing effort and allows teams to deploy more quality-assured changes to the business more quickly and with less risk exposure.[29]

While the Agile Manifesto states that "the best architectures, requirements, and designs emerge from self-organizing teams",[30] this does not mean "[…] one should never spend time up front making architectural decisions."[31] It is good practice for SAP implementations to choose the basic architectural runway before development efforts begin to avoid extensive redesign at a later stage. This is due to the inherent architecture of SAP systems. A good starting point for an intentional architecture is Accenture's digital decoupling concept. Digital decoupling means leveraging new SAP HANA features and combining them with solutions out of the non-SAP space. Key parts of this concept include a clear API strategy, a consequent data event strategy, and focus on automation. This type of approach offers flexibility when building an architecture, as changes can be more easily implemented.

Figure 9: Accenture Case Study: Opportunities with SAP S/4HANA Automation

QUALITY
SAP S/4 Hana
Implementation Testing

326
SAP system defects identified
in functional testing

0 present in production

92
SAP defects identified
in security testing

SPEED AND AGILITY
SAP S/4 Hana
Implementation Testing

80%
Product and regression testing
automated during testing cycles

16
Practice cutovers to reduce
cutover time

180
Manual activities automated
during test cycles

COST REDUCTION
SAP Software
Regression Testing

50%
Reduction in following FY
testing budget

SAP S/4 Hana
Implementation Testing

12,000
Manual hours saved

It is important that automated testing tools, such as Worksoft Certify or Trisentis Tosca, in combination with SAP's server and database systems are well understood and integrated prior to development.

These tools are extremely beneficial at the end-to-end and service level (see Fig. 10 below). For unit testing, SAP ABAP Unit Test and Junit (for Fiori) should be used.

The orchestration of the full set of tools is as important as automating the end-to-end pipeline. The guiding principle on a meta level, especially in an SAP environment, must be the testing fir tree. With the SAP ADOP framework[32], Accenture provides a fully orchestrated tool pipeline which follows following the testing fir tree approach.

Figure 10: The New Way of Testing – From the Test Automation Pyramid to the Testing Fir Tree as Guiding Principle for Testing (Automation)[33]

TEST AUTOMATION PYRAMID
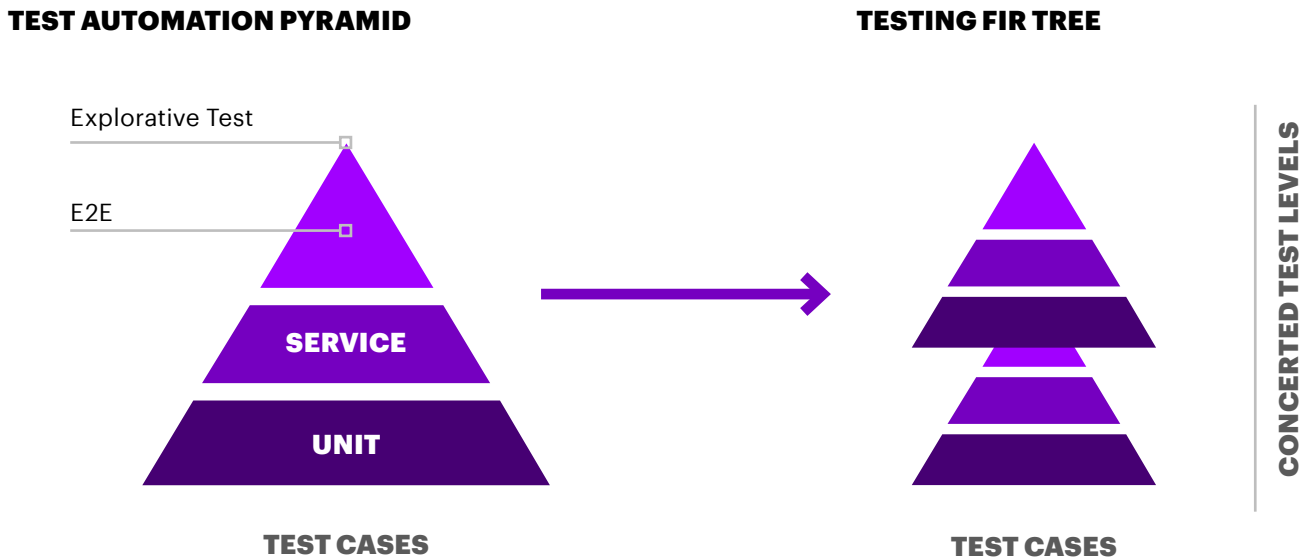
TESTING FIR TREE

MODERN TECHNOLOGY FOUNDATIONS AND TOOLCHAINS BASED ON THE TESTING FIR TREE APPROACH ARE KEY ENABLERS AND ACCELERATORS FOR THE AGILE TRANSFORMATION.

#10 LEAN-AGILE LEADERSHIP

In order to optimize flow of value to customers and maximize competitiveness, leaders must be forward thinking. They must exhibit the vision and commitment to develop a culture of continuous learning and adaptation. Additionally, they need to engage their knowledge workers in realizing that vision. This requires leaders to adapt and innovate quickly in line with the products they oversee.

Old, ingrained management habits need to be shed in order to grow and lead – even in the face of constant change, uncertainty, and market volatility. This may also require redesigning organizational structures and processes to optimize realization of vision, while incorporating a continuous improvement mindset. We call this capability leadership effectiveness.

In the Agile organization, managers are stewards – designing environments where delivery agility and product innovation thrive through the passionate engagement of knowledge workers.

This requires active work on structures, processes, and culture at many levels, and calls for Agile leaders who thrive in complexity. There are three indicators of leadership effectiveness:

1. **The ability to establish and engage others in a compelling vision**

2. **The ability to evolve organizational capability and fitness**

3. **Leadership that maximizes learning**[34]

LEADERSHIP EFFECTIVENESS GUIDES ORGANIZATIONS THROUGH COMPLEXITY BY ESTABLISHING A COMPELLING VISION AND EVOLVING ORGANIZATIONAL ADAPTABILITY.

To deliver successful Lean-Agile SAP implementations, a transformation of the organization toward a Lean-Agile mindset is vital. This requires upfront investment whenever change management, training, coaching, and commitment from leadership takes place. It is of utmost importance that top management lives and practices the Lean-Agile way of working.

The following questions provide the guidance to start thinking about required organizational capability to excel in delivery and ultimately business agility.

Tab. 1: Organizational Capabilities: Crucial Questions for Leadership[35]

ORG CAP	LEADERSHIP OPPORTUNITIES
DELIVER FAST AND RESPONSIVELY	**Assess your delivery capability** • Is high quality a part of every team's deliveries? • How well do you scale? • Are teams able to make tradeoffs and release small increments? • Are we improving the full development value stream, from idea through development through operations and support? • Is automation leveraged to increase learning and reduce waste?
INNOVATE AND DISRUPT	**Determine how much innovation is a part of your org** • Do teams rapidly experiment with customers? • Are we attempting to disrupt and examining how we might be disrupted? • Are product goals connected to more strategic goals? • Are we "maximizing the amount of work **not** done"? • Is automation leveraged to increase learning and reduce waste?
ADAPT ORGANIZATION AND CULTURE	**Assess your organization's "fitness for purpose"** • Do structures and processes enable success or impede it? • Are roles clear, and do personal development goals align with product success goals? • Are we hindered by functional silos? • Is learning and "failure" encouraged? • Is transparency welcome or avoided? • Do we have an environment that encourages decision making or is it stifled by need for consensus?
LEAD THROUGH COMPLEXITY	**Examine your Agile leadership effectiveness** • Are managers designing environments for success? • Do managers have a clear idea for success? • Are managers becoming better at leading in complexity? • Is there a clear development path for managers to become Agile leaders? • Do leaders have a transformation strategy and plan that is continuously adapted?

04
CONCLUSION

> **"The world has changed and we cannot solve problems by using the same kind of thinking we used when we created them"** [36]
> **– Albert Einstein**

SAP has announced that starting at the end of 2025, it will suspend maintenance of its business suite applications as clients move to the cloud-based SAP S/4 HANA. Successful organizations will approach this as more than a system upgrade. They will extract maximum value from new technology by first understanding its potential impact on their operating model, processes and customers. They also will holistically transform end-to-end value streams to unlock a higher return on investment with SAP delivery agility.

SAP delivery agility is a competitive imperative in situations characterized by dynamic complexity [38] that delivers critical core systems to lay the foundation for business agility. This helps organizations deliver a smoother-running business and better economic outcomes by harnessing the power of disruption to lead with speed, confidence, and innovation.

Accenture has helped over 600 Agile-based SAP engagements to successfully accelerate large-scale SAP implementations, leveraging leading edge Lean-Agile delivery approaches. The 10 Scaled Agile Framework (SAFe) Essentials need be mastered for SAP S/4HANA implementations and operations with the minimum integrated business process concept at the heart of SAP delivery agility.

Organizations that have not yet started their journey to master SAP delivery agility have to start transforming their organization towards a Lean-Agile mindset. Leadership must understand and apply the principles and behaviors of a Lean-Agile mindset to lead the implementation towards a new way of working. It is of utmost importance that top management commits and practices the Lean-Agile way of working. This is supported by applying the SAFe Lean-Agile Principles and following the SAFe Implementation Roadmap.
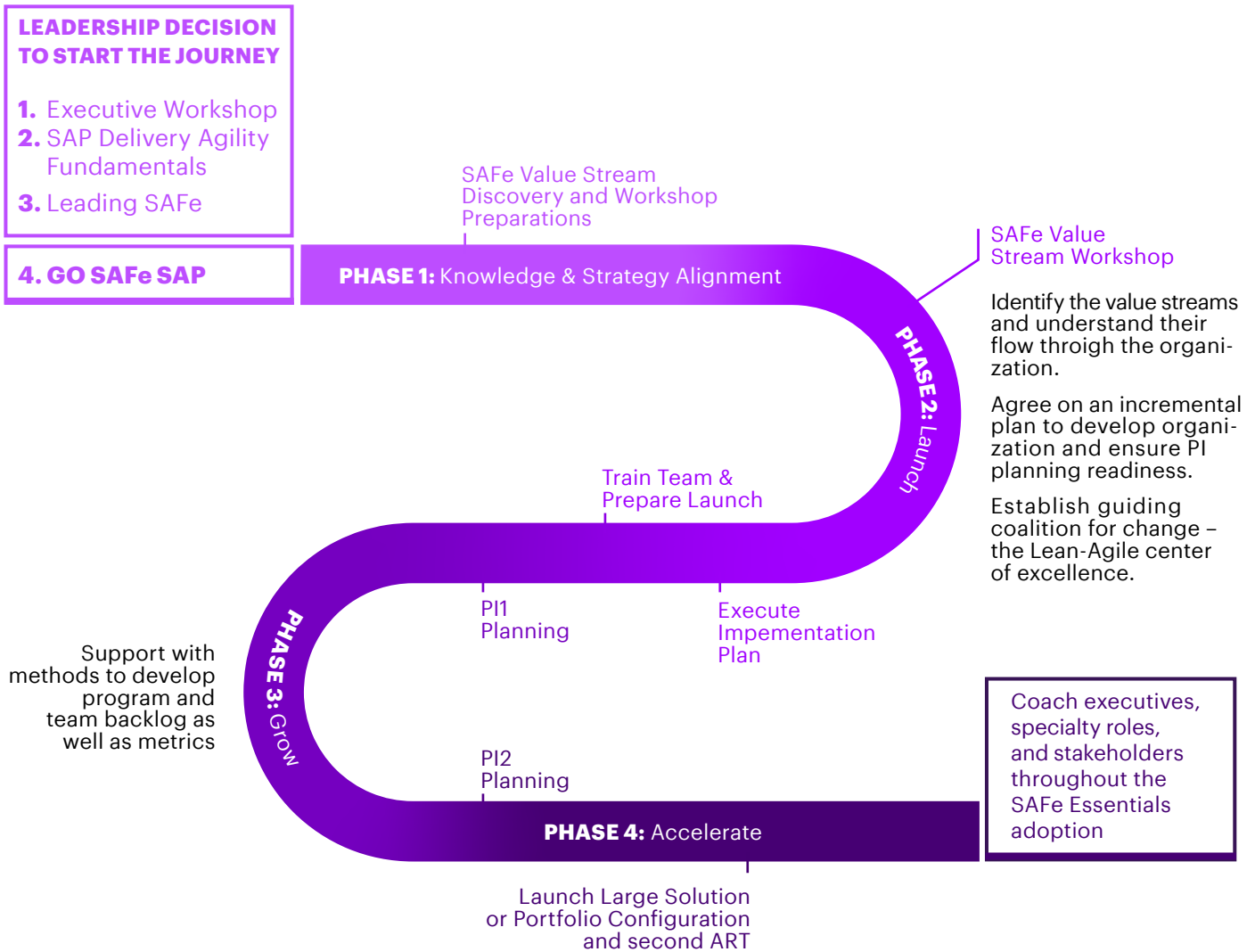
The goal of achieving the shortest sustainable lead time should always be present in a leader's mind. It guides their thinking and leads them to identify opportunities to improve flow. This incorporates lean and flexible methods to deliver customer-centric, fit-for-purpose solutions with the highest business value. In this sense, leadership becomes the driving force in creating a culture based on improvement which eventually leads to waste reduction and the elimination of delays. In addition, leaders guide the transformation with a vision to unleash purpose, motivation, and alignment across the organization.

Though SAP ERP is a large-scale implementation which might require more than one Agile Release Train, SAFe Essentials provide the most basic configuration that guides SAP ERP enterprises to start a full Agile adoption and move toward SAP delivery agility. It provides substantiated practices, techniques, and tools on all levels of an organization, which can be implemented in an SAP environment. Once implemented, it can be scaled further throughout the organization. The recommended delivery approach journey begins with leadership committing and investing in continuous learning for everyone in ART(s) to equip them with the right knowledge and understanding of both the delivery process and the SAP system itself. Proven success patterns, such as the implementation roadmap (Figure 10), together with applying SAFe Essentials and the minimum integrated business process, guide the organization to continuously iterate to an optimum customer-centric ERP solution.

> **"Everyone is already doing their best; the problems are with the system [...] only management can change the system."** [37]
> **– W. Edwards Deming**

Figure 11: SAP Delivery Agility – Proven Success Pattern for Accelerated Outcomes

LEADERSHIP DECISION TO START THE JOURNEY

1. Executive Workshop
2. SAP Delivery Agility Fundamentals
3. Leading SAFe

4. GO SAFe SAP

SAFe Value Stream Discovery and Workshop Preparations

PHASE 1: Knowledge & Strategy Alignment

PHASE 2: Launch

SAFe Value Stream Workshop

Identify the value streams and understand their flow throgh the organization.

Agree on an incremental plan to develop organization and ensure PI planning readiness.

Establish guiding coalition for change – the Lean-Agile center of excellence.

Train Team & Prepare Launch

PI1 Planning

Execute Impementation Plan

PHASE 3: Grow

Support with methods to develop program and team backlog as well as metrics

Coach executives, specialty roles, and stakeholders throughout the SAFe Essentials adoption

PI2 Planning

PHASE 4: Accelerate

Launch Large Solution or Portfolio Configuration and second ART

05
AUTHOR

Malte Kumlehn
PMP – SAP Business Agility Pioneer | Head of SAP Delivery Excellence
SAFe SPCT Candidate

06
ACKNOWLEDGEMENTS

07
CONTACT

Malte Kumlehn
SAP Business Agility Pioneer
Head of SAP Delivery Excellence | SAFe SPCT Candidate

Malte.Kumlehn@accenture.com

Thomas Karl
Quality Management & Test Automation Expert
Head of Quality Transformation Services | SAFe SPC, LSS
MBB Candidate

Thomas.Karl@accenture.com

REFERENCES

1 Accenture (2019). Accenture Technology Vision 2019: The Post-Digital Era is Upon Us, are you ready for what's next? *https://accenture.com/_acnmedia/PDF-94/Accenture-TechVision-2019-Tech-Trends-Report.pdf*

2 Weforum (July 2019). *https://weforum.org/agenda/2019/05/humane-leadership-is-the-4irs-big-management-innovation*

3 Accenture (2019). Accenture Technology Vision 2019: The Post-Digital Era is Upon Us, are you ready for what's next? *https://accenture.com/_acnmedia/PDF-94/Accenture-TechVision-2019-Tech-Trends-Report.pdf*

4 PAC, Market Figures – SAP Services Worldwide (March 4, 2019).

5 PAC, SAP Figures Worldwide.

6 The Fifth Discipline: The Art & Practice of The Learning Organization Peter M. Senge (2006).

7 PMI, F. I. (2017). The Essential Influence of the C-Suite. Newtown Square: Project Management Institute. *https://pmi.org/learning/thought-leadership/series/achieving-greater-agility/essential-influence-c-suite*

8 PMI, F. I. (2017). The Essential Influence of the C-Suite. Newtown Square: Project Management Institute. *https://pmi.org/learning/thought-leadership/series/achieving-greater-agility/essential-influence-c-suite*

9 Gartner (2019). First Steps in Applying Agile and DevOps to ERP Support.

10 Accenture (2017). Agile for SAP Solutions. *https://accenture.com/_acnmedia/PDF-71/Accenture-Agile-for-SAP-solutions-PoV-nov17-web.pdf*

11 SolutionsIQ (2019). What is Delivery Agility. *https://www.solutionsiq.com/capabilities/deliver-fast-and-responsively/*

12 Dove, Rick (2001). Response Ability: The Language, Structure and Culture of the Agile Enterprise. John Wiley & Sons Inc.

13 © 2019 SAP SE (2019). SAP Support Strategy. *https://support.sap.com/en/offerings-programs/strategy.html*

14 Kersten Mik (2019). project to product. How to survive and thrive in the age of digital disruption with the flow framework

15 © 2010-2019 Scaled Agile, Inc. (2019). Accelerating Business Value with SAFe and Technology Business Management.

16 Eric Ries (2019): The LEAN STARTUP Methodology. *http://theleanstartup.com/principle*

17 Accenture (2019). New ERP: Tech upgrade or transformation catalyst? *https://www.accenture.com/us-en/insights/strategy/erp-transformation*

18 West, M. and Faith, T. (2019). First Steps in Applying Agile and DevOps to ERP Support.

19 Poppendieck, Mary and Tom. Addison-Wesley (2006). Implementing Lean Software Development: From Concept to Cash.

20 © Scaled Agile, Inc. (July 2019). *https://scaledagileframework.com/essential-safe*

21 © Scaled Agile, Inc. (July 2019). *https://scaledagileframework.com/apply-cadence-synchronize-with-cross-domain-planning*

22 Accenture (July 2019). *https://accenture.com/_acnmedia/PDF-71/Accenture-Agile-for-SAP-solutions-PoV-nov17-web.pdf*

23 Accenture (2019). Case Study Test Automation. *https://www.accenture.com/us-en/success-sap-test-automation*

24 © Scaled Agile, Inc. (July 2019). *https://scaledagileframework.com/solution-demo*

25 Poppendieck, Mary and Tom (2006). Implementing Lean Software Development: From Concept to Cash.

26 © Scaled Agile, Inc. (July 2019). *https://scaledagileframework.com/innovation-and-planning-iteration*

27 Karl, Thomas and Liedl, Nico: Agiles Quality Engineering – Qualitätssicherung im Kontext von großen agilen Software-Entwicklungsprojekten. German Testing Magazin (2018). *https://accenture.com/t00010101t000000z__w__/de-de/_acnmedia/pdf-94/accenture-qualitatssicherung.pdf*

28 Karl, Thomas and Liedl, Nico: House of Agile Testing – Von der Testpyramide zur Testtanne als Methoden zur Toolintegration, German Testing Magazin (May 2019).

29 Accenture, Test Automation (2019). *https://accenture.com/us-en/success-sap-test-automation*

30 Manifesto for Agile Software Development (July 2019). *http//agilemanifesto.org*

31 Robert C. Martin, The Scatology of Agile Architecture, Clean Coder (2009).

32 Accenture SAP ADOP Framework. *https://accenture.com/_acnmedia/pdf-93/accenture-sap-testing.pdf*

33 Karl, Thomas and Liedl, Nico: House of Agile Testing – Von der Testpyramide zur Testtanne als Methoden zur Toolintegration, German Testing Magazin (2019).

34 SolutionsIQ (July 2019). *https://solutionsiq.com/capabilities/lead-through-complexity*

35 SolutionsIQ, Unlocking Business Agility (2018). *https://solutionsiq.com/resource/white-paper/unlocking-business-agility*

36 Einstein, A. and Calaprice, A. (2005). The New Quotable Einstein

37 Deming, W. Edwards (1982). Out of Crisis, The MIT Press; Reprint edition (August 11, 2000).

38 The Fifth Discipline: The Art & Practice of the Learning. Organization Peter M. Senge (2006)