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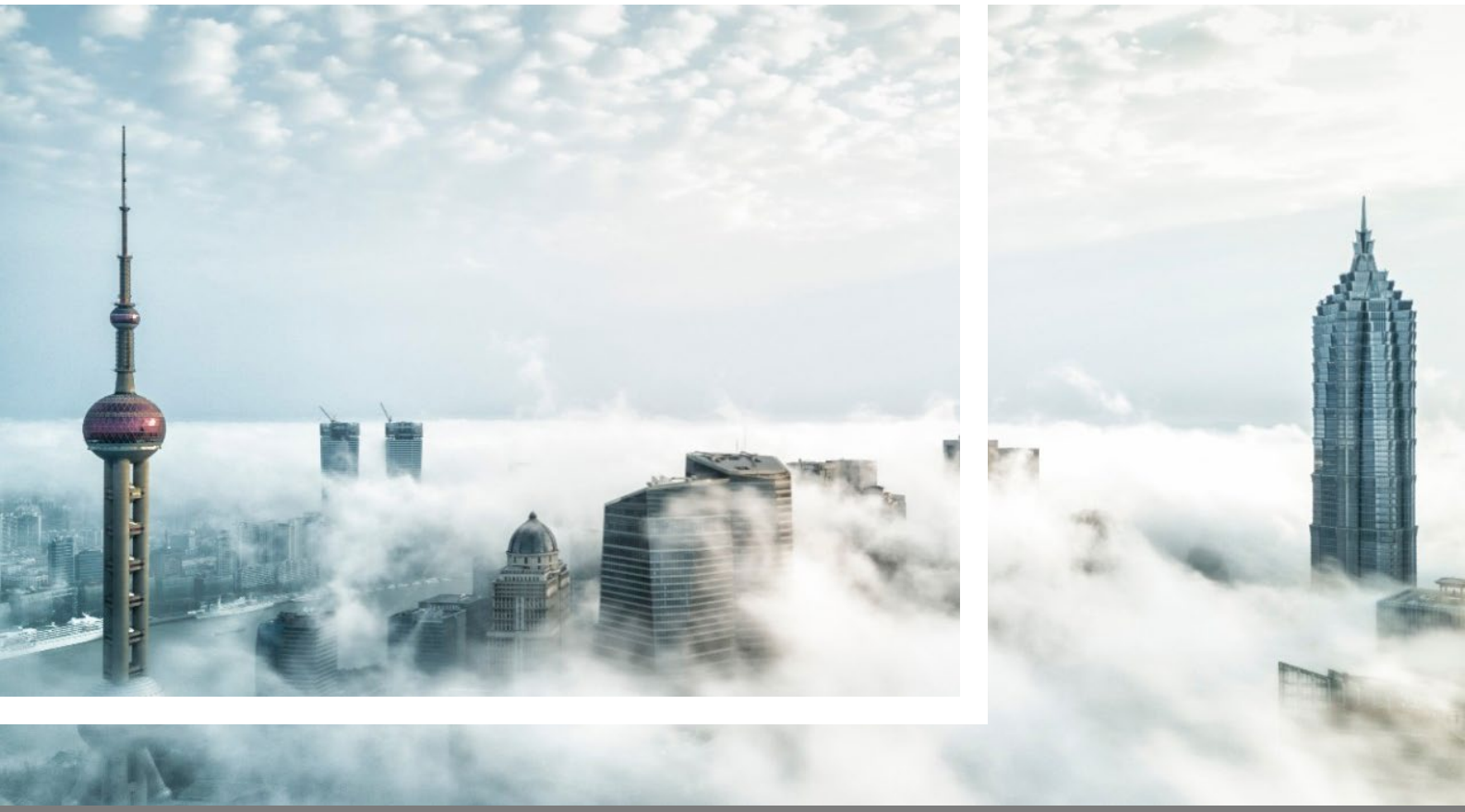
Safeguard business transformation in the cloud

with SAP S/4HANA and side-by-side architecture



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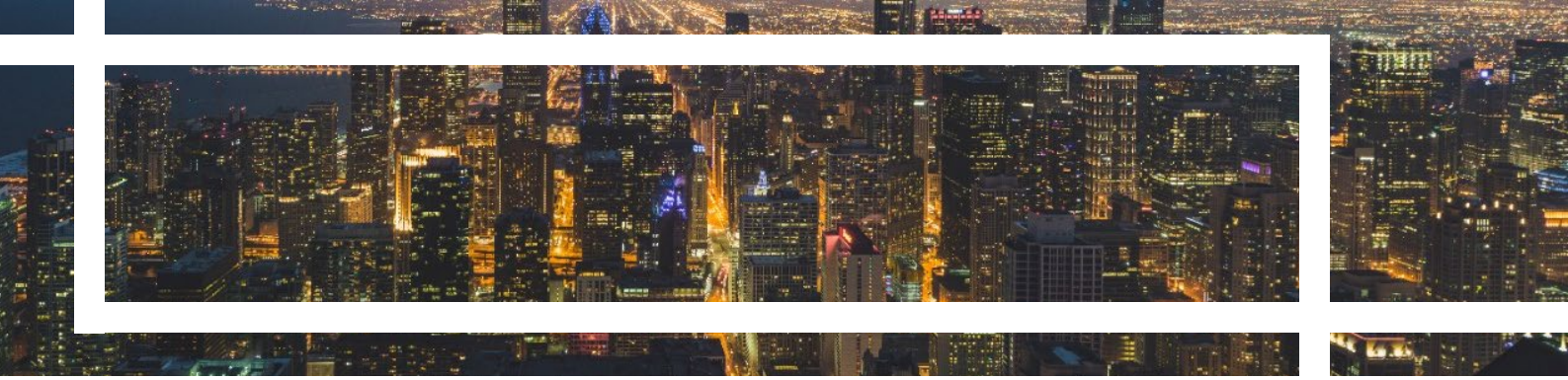


S/4-centric landscapes increasingly demand a new architecture

The emergence of new technologies is continuously changing the anatomy of enterprise applications. New players who have embraced these technologies in their products' core design are challenging more established players in the market. Anticipating these technological advancements and increasingly fierce competition, SAP has drastically changed the way it packages its products and services over the last decade.

It is now imperative that customers accordingly evolve their system and application landscapes, and maximise the value from their SAP investments. As organisations embark on this transformation journey, they must adopt new architectures to create robust, modern platforms that ensure reliable operations and promote future innovations. The following drivers will make adoption of such architecture inevitable.

Key business and IT drivers

Keep the core clean

Standardisation remains a high-value target for organisations with global operations. Organisations see standardisation as a means to improve operational performance and achieve cost-effectiveness. One of the approaches to achieve standardisation is adopting packaged software – such as SAP S/4HANA – at the core of enterprise application landscapes. However, in order to sustain the level of standardisation achieved, organisations must strive to keep the core clean by minimising custom developments in the core.

Transition to the cloud

In order to reduce the total cost of ownership, organisations are migrating their SAP and non-SAP workloads to cloud systems. With its latest offering (RISE with SAP), SAP is also tactically pushing its customers to transition to cloud solutions by bringing together several of its cloud offerings under single licensing model. In order to ease this transition in the future by reducing the change efforts, organisations must design their S/4-centric landscapes carefully.

Increase business and technical agility

Organisations are constantly aiming to increase the speed of business innovations and improve their service level agreements through adoption of agile delivery practices. However, the traditional approach to implementing extensions using custom developments in the enterprise resource planning (ERP) core often increases complexity. Loosely coupled architecture that minimises custom implementation in the core simplifies the implementation of a continuous integration, continuous deployment (CI/CD) pipeline and thus enhances business agility and technical agility.

Based on our rich and diverse experience in S/4-led business transformation programmes, PwC and smartShift have developed a rigorous method to enable the transition to new architecture through a combination of intelligent design and smart tooling. This paper describes key aspects of our approach to accelerating the transition and safeguarding the value that these programmes bring over an extended period.

Closing the loop with standardisation

In the paper "Demystifying Standardisation with SAP S/4HANA", we discussed what standardisation is from an ERP perspective, and examined the idea that organisations must often adopt process variants to close the gap or to gain a competitive edge. In this paper, we aim to outline a modern approach to implementing these variants.

Side-by-side architecture brings agility and flexibility to landscapes

Traditional architecture concentrates most of the process implementations in a single monolithic core. It entails implementing extensions by developing custom code and custom interfaces in the core using native enhancement options provided by SAP. In almost all cases, such implementations follow the traditional ABAP model. Although such a tightly coupled approach provides complete flexibility to meet all kinds of custom requirements, it leads to a highly customised monolith over time.

In contrast, side-by-side architecture distributes process implementations across several applications which are orchestrated using an integration layer. It leverages native capabilities of hyperscalers and container platforms to implement custom requirements or variants in the form of cloud-native extensions. These implementations follow microservices-based or serverless architecture patterns and agile practices such as DevOps for CI/CD.

Key elements of side-by-side architecture

The following are some of the key elements of such an architecture, each of which plays a vital role in its ability to provide value.

SAP S/4HANA Core

A clean S/4 core is at the heart of side-by-side architecture. It hosts the standard functions for business process execution and invokes custom implementations elsewhere which complement the standard execution.

Hyperscalers, Container Platforms

The extensions are built, deployed and operated in cloud environments managed entirely by hyperscalers like Microsoft Azure, Google Cloud Platform, AWS and/or container platforms like OpenShift. The implementation makes use of native platform capabilities like database and developer services for developing applications, integration services for integration with other services and operations services for managing the application.

SAP Business Technology Platform

The extensions could also be developed and hosted in SAP BTP, a cloud platform managed by SAP. More significantly it provides standard services to augment business processes in the core and enhance their performance through use of innovative technologies. It also provides standard packages for integration between SAP S/4 core with other SAP SaaS applications.

SaaS solutions around S/4 Core

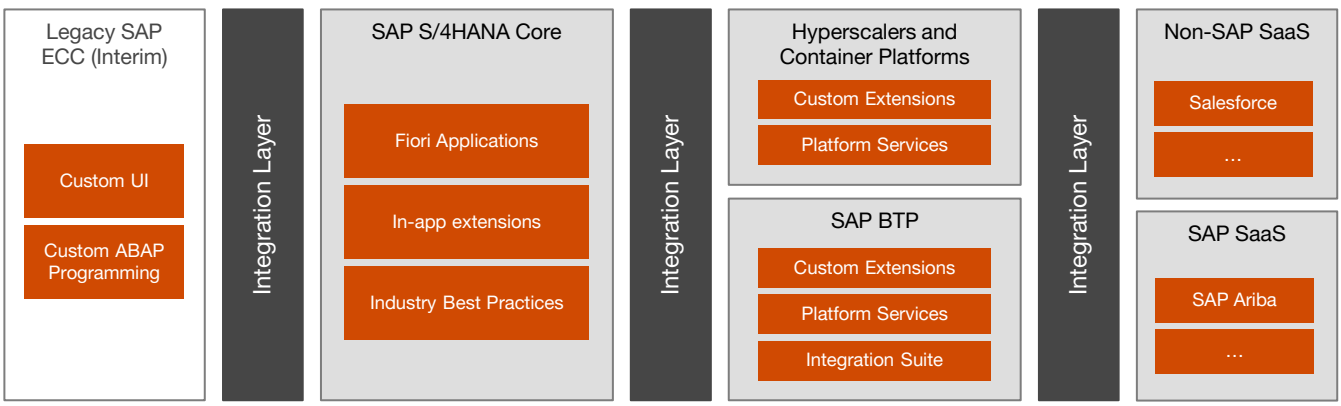
A cluster of services and applications (both SAP and non-SAP) that surround the core independently run either complete or part of the process executions. These are cloud offerings entirely managed by vendors and follow either a subscription-based or consumption-based licensing model.

Hybrid Integration Layer

The integration layer keeps all the key components together and acts as the primary communication channel. It represents a mix of integration technologies, such as integration platforms as a service (iPaaS), event-based messaging platforms, and API management platforms.

These different elements together bring modularity, flexibility and scalability to the landscape. Modularity ensures agility and increased reusability, flexibility ensures independent operations and minimum disruptions resulting from changes in the landscape, while scalability ensures quality of service while keeping operation costs reasonable.

Side-by-side architecture for S/4-centric landscape



A reduced S/4HANA core is increasingly seen as the way forward

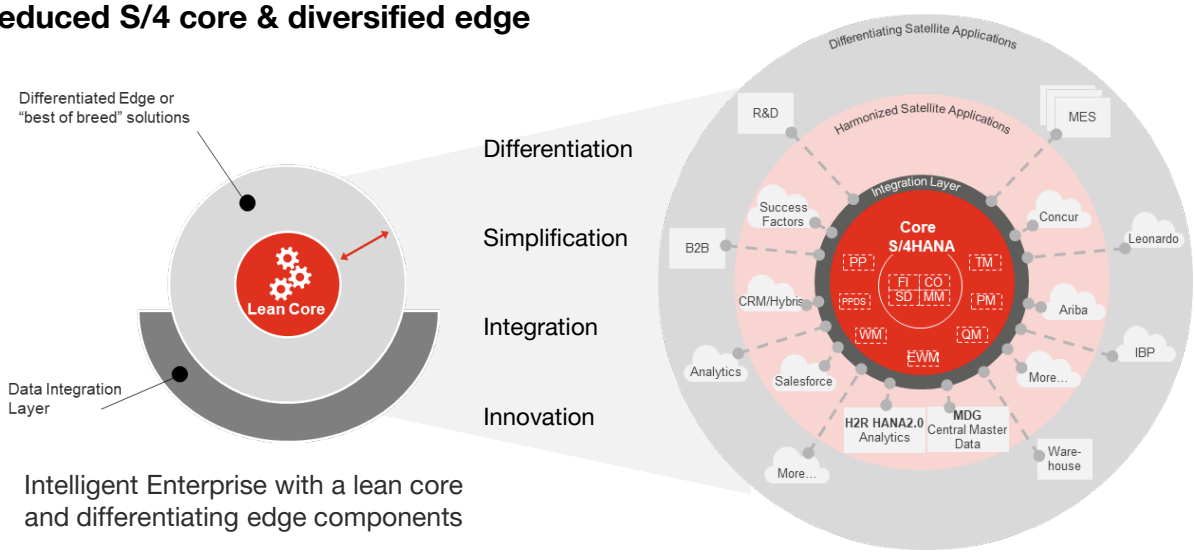
Our recent analysis shows a varying but clearly growing trend towards reduced core for different end-to-end processes.

Process-centric architectures are driving the next wave of cloud transformation

- **Market to Order:** Various Cloud-based customer front-end applications e.g. Salesforce Commerce Cloud, SAP C4C, SAP Hybris, hosted on hyperscalers and container platforms are a growing trend for customer-facing processes.
- **Order to Cash:** Core O2C processes are the heart of an ERP core and new features and releases in core (e.g. Advanced ATP) serve to make it better. Businesses are striving for better integration capabilities between logistics processes in S/4 core and Sales/Marketing applications in the container platforms on cloud (e.g. Salesforce, SAP C4C). PwC has developed an integration platform, the PwC Connected Journey Suite, on top of Mulesoft to integrate S/4HANA with Salesforce Core Clouds seamlessly.
- **Procure to Pay:** Trend mostly towards a lean core which takes care of the aspects e.g. subcontracting, while integrating with Cloud applications specializing in eProcurement (e.g. SAP Ariba, Coupa) and Supplier Collaboration (SAP SRM, Jaggaer).
- **Forecast to Plan:** Transition from SAP SCM to niche / best of breed planning applications (SAP IBP, Kinaxis, Blue Yonder) is driving integration needs with S/4 core.
- **Plan to Produce:** S/4 core offers advanced features e.g. MRP Live, Demand Driven MRP which unlocks new optimization potential in the Demand-to-Supply process. Manufacturing processes demand integration with various 3rd party solutions for shopfloor operations e.g. MES, enhanced warehousing and transportation with hybrid deployment options.
- **Record to Report:** Integrated Finance & Controlling processes in S/4 Core as Universal Ledger, are being ably supported by various non-core extensions (e.g. RPA, AI) to cater for process automation and advanced analytical needs.
- **Hire to Retire:** In the last years, with SAP SuccessFactors, SAP Fieldglass, and Workday solutions for Human Capital Management processes, there is a growing trend for container platforms with clear integration points for topics e.g. payroll.

The observations stated here clearly highlight the trend towards a modern side-by-side architecture. The illustration below depicts a typical hybrid architecture comprising core S/4HANA processes and a diversified cloud-enabled edge applications.

Illustrative target architecture based on trends for a reduced S/4 core & diversified edge



Intelligent Enterprise with a lean core and differentiating edge components

Success stories demonstrate value potential of a simplified core with custom implementations in the cloud

Landscape transformation and modernisation for a multinational consumer goods corporation

This client planned to consolidate their multiple productive process verticals into regional business systems. smartShift is helping to consolidate the custom applications, converting legacy UI to Modern FIORI UI. The journey started on S/4HANA 1909 with a plan for a two-tier ERP using SAP Business Technology Platform later.

Value realised

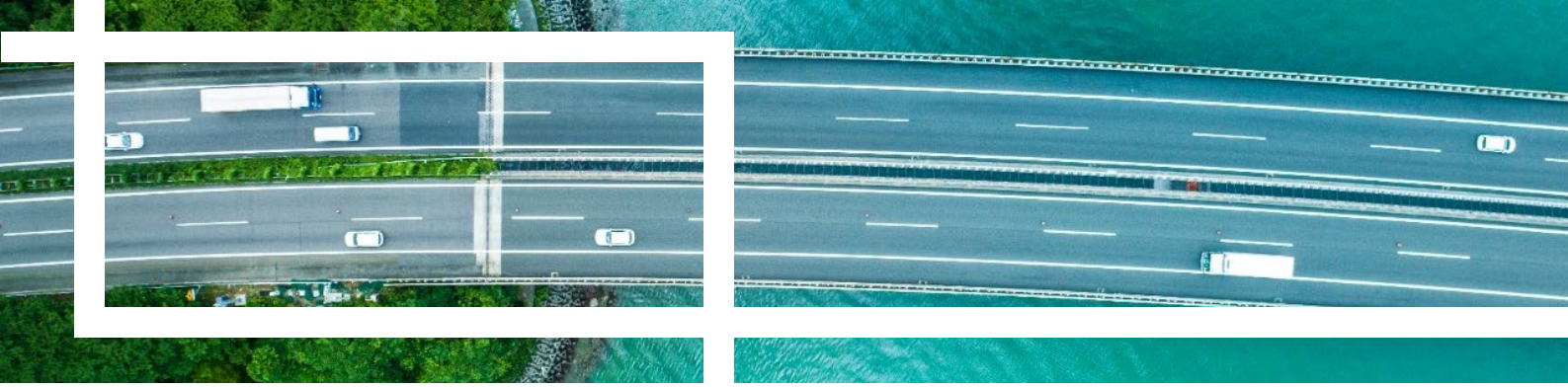
- Massive acceleration of the transformation program
- Leaner custom footprint (-40%) due to decommissioning and selective carve-out
- Non-disrupted innovation during the programme due to automated synchronisation of ECC and S/4HANA parallel

Automated S/4HANA conversion and modernisation for a global manufacturer of premium cars and motorcycles

During their conversion to S/4 from legacy SAP ECC, this client used smartShift automation to achieve a clean SAP core for its SAP logistics template. They did this by decommissioning aggressively and only keeping what the business required. The remaining components were simplified with lean packages and standardised interdependent connections. Many applications were completely carved out and implemented as microservices on container platforms.

Value realised

- 70% less custom code
- Architecture simplicity due to reduced dependencies
- Increased business and technical agility



A staged approach enables a smooth transition to the target architecture

Transitioning from today's classical approach to the target architecture is not a big bang event, but a continuous process. We propose a carefully designed four-step approach, supported by intelligent automation tools for a successful transition.

Four-step approach for transition

Step 1: Decommission and decouple

The first step starts with a thorough analysis to understand the legacy custom applications, their dependencies on the S/4 core, and any interdependence. Those applications that can be replaced by new functionalities in S/4 core are then decommissioned. Custom applications which are still required are repackaged in preparation for a later carve-out and further modernisation.

Step 2: Modernise

In the second step, the modernisation journey starts, supported by intelligent automation tools to accelerate the process. Legacy user interfaces are converted to modern Fiori Apps. Classical ABAP implementations are converted to RESTful ABAP artifacts or are reimplemented as microservices based on popular programming models like NodeJS and/or Java.

Step 3: Integrate

Next, the reimplemented or newly developed applications are integrated with the S/4 core, legacy ERP or other applications and services in the landscape. This is done through the hybrid integration layer, following an API-first integration strategy.

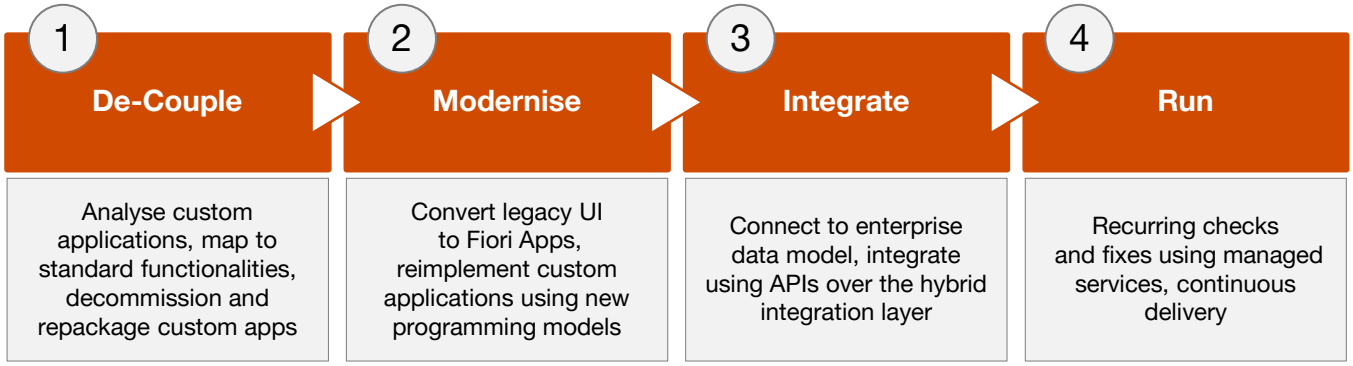
Step 4: Run

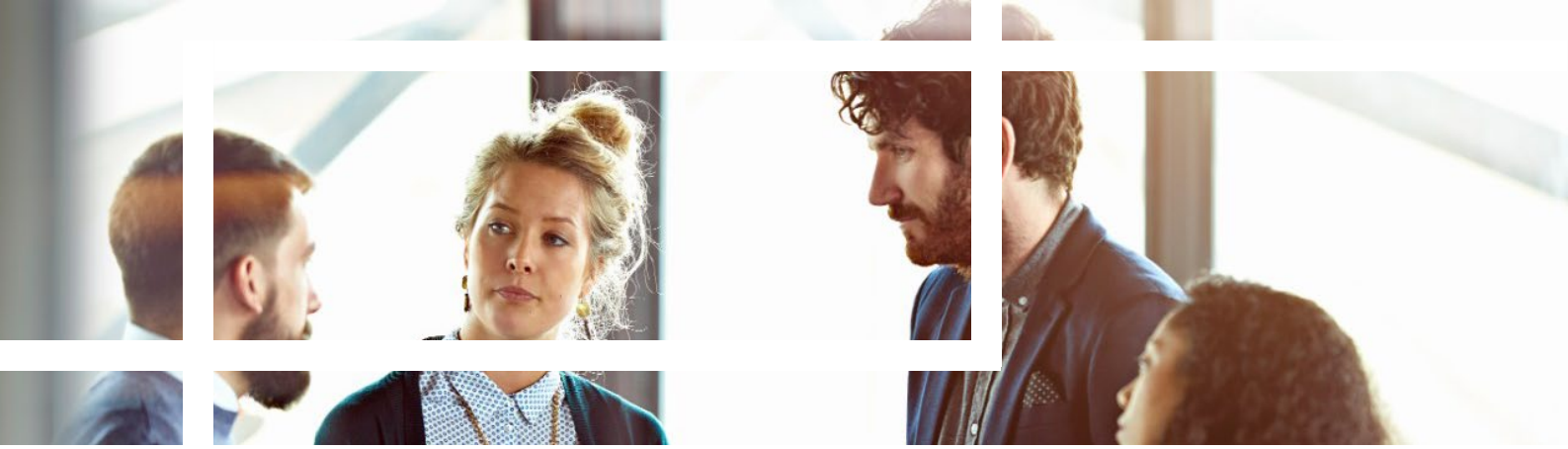
Finally, the modernised applications run natively in the cloud and follow agile practices such as DevOps for continuous delivery. Recurring checks, fixes and enhancement can be implemented quickly and easily using an automated setup.

Possible scenarios for transition

The transition could be planned as a sub-project of a wider S/4 transformation program or as a follow-up project after its implementation. It could even prove beneficial to undertake some transition efforts on legacy ECC systems. The timeline might be influenced by many factors, such as business objectives, project costs and other organisational factors. In all of these cases, the staged approach ensures a smooth and successful transition.

Staged approach towards side-by-side architecture





The way to get ahead is to start now!

For organisations where digitalisation is high on the agenda, and those who consider S/4-led transformation programs as an essential prerequisite for their overarching digital transformations, the transition to side-by-side architecture is an absolute must. It does not matter where you are in your S/4 transformation journey, there are significant benefits that can be reaped through a clever and comprehensive plan. However, to make this transition successful, consider some of the key success factors.

Key success factors for a successful transition

Organisational enablement

For organisations that have been running on SAP for decades and have built up huge expertise in old technologies (such as ABAP), it is important to upskill resources. It is also vital to align with the organisation's existing cloud strategy, and to employ similar tools and technologies used in other digital initiatives. Finally, a governance body to oversee the transition to the new architecture and future operations must also be put in place.

Operating model that spans ecosystems

As organisations transition from traditional architecture to a more modern setup, they must consider the complexities introduced by an interim state that needs to operate across a wider spectrum of technologies. They need an operating model that accounts for the challenges in change management processes posed by a relatively heterogenous ecosystem.

Smart migration of existing assets

In order to safeguard investments made so far in the form of extensions, custom code and other services built using traditional methods, a reliable, fast and cost-effective migration approach is required. smartShift offers an intelligent collection of tools that take a methodical and automated approach to carry out the technical migration and modernisation of custom code and other asserts.

Astute strategy and roadmap for transition

Finally, a successful transition requires a well thought-out strategy and a comprehensive roadmap that take into account the organisation's current state, short and long-term objectives and pain points.

Benefits of side-by-side architecture

- **Increase business agility** by reducing the S/4HANA core
- **Reduce total cost of ownership** through cost-effective cloud infrastructure and increased flexibility in the landscape
- **Make standardisation sustainable** by reducing custom implementations in the core
- **Maximise value from S/4 investments** by leveraging cloud-native services to complement S/4 capabilities
- **Open doors for innovation** by unlocking hidden transactional data
- **Create possibilities for new revenue channels** by converting data assets and services into digital offerings

Our preliminary assessment can help ensure that your organisation is ready for transition to side-by-side architecture

- Strategic alignment
- Scope and opportunity analysis
- Migration strategy evaluation
- Target architecture
- Acceleration roadmap
- Directional business case

Our experience and assets will help you complete a successful transition

- Architects, engineers and SMEs
- Best practices and accelerators
- Automation tools

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