Deloitte.

MuleSoft

SAP Integration

The path to more security and transparency

When your systems, data sources are connected and managed through an API network, your integration process will be faster, more flexible and more secure.

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IT: a blessing and a curse

For decades, companies have been reaping the rewards of innovation in software technology. Implementing and operating standardized processes and data modelling has improved productivity and created value. Standardised software suites have made it possible to benefit quickly from advances in software research and development, whilst having a good overview of costs incurred.

State-of-the-art ERP, SCM and CRM platforms offer user-friendly and wide-ranging customizations, which have made our businesses more competitive. Their in-built scripting languages, interface descriptions and libraries enable us to extend and customize out-of-the-box functionality.

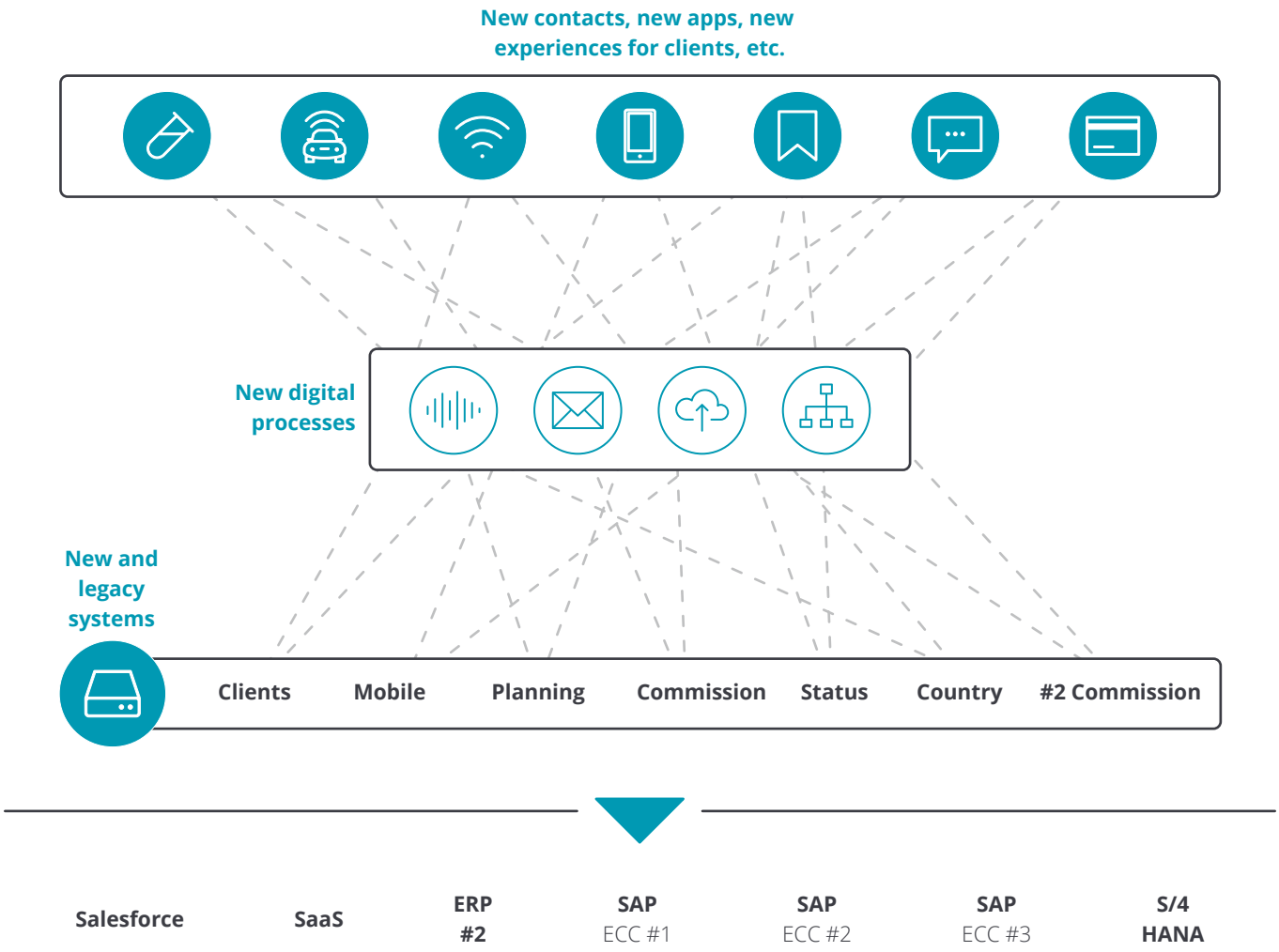
Over time, however, we have gone from relatively few customizations to a massive number of complex custom applications, which keep moving further away from the original core system. This makes it difficult to upgrade or modernise the overall system landscape.

There is little to no documentation available for the vast amounts of code in these systems. In most projects, the process logic is hidden within millions of lines of code, making it virtually impossible to reuse and difficult to maintain. For most companies, this leads to each new project having to start from scratch and unable to benefit from work that has already been

On top of that, each platform has a proprietary language and different interfaces; users cannot make modifications without highly specialized knowledge. That gives us no choice but to hire experts with specific platform expertise – who can charge top-dollar daily rates, because access to this kind of expertise is limited.

More software means higher productivity, but also greater complexity.

Fig. 1 – Point-to-point integration is a huge challenge

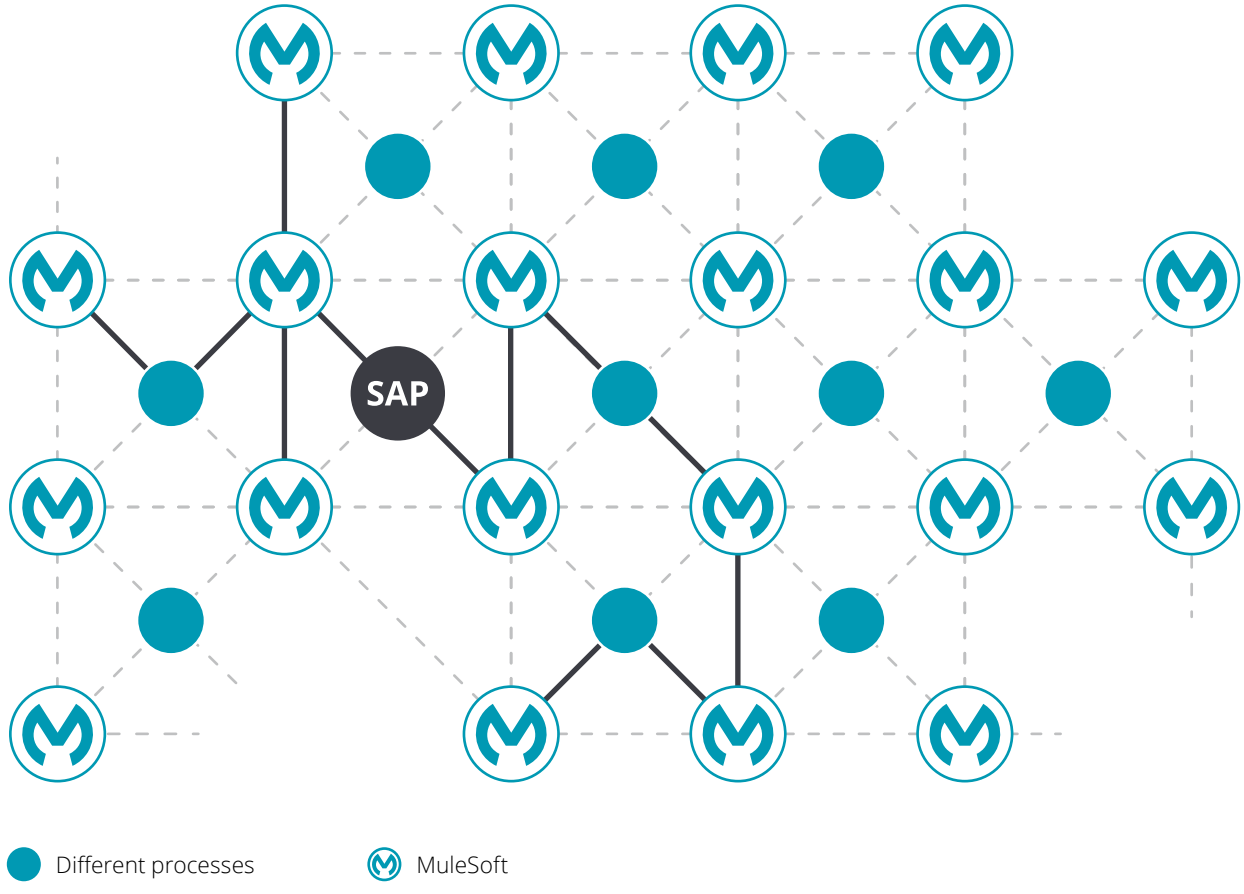


The Challenge

In sectors where digital transformation is upending conventional business models, companies are under a lot of pressure from their customers to provide better service and more access to the information they see as relevant. Only those players with a quick and consistent approach to digitisation will be able to prevent customers from switching to a more agile competitor. Brand loyalty is on the decline; companies are finding the need to make data-driven decisions, in order to recognise trends fast enough to adjust their product and service range as needed.

A lot of the business processes in use today rely on ERP systems in general and SAP in particular. For many years, SAP has succeeded in bringing innovation to market and allowing customizations. The current version (ECC) has become increasingly complex, and is reaching its technological limits. SAP is pushing customers to upgrade to the new S/4 version on the basis of the real-time database HANA and plans to stop offering maintenance and support for on-premise legacy versions as of 2027.

Fig. 2 – Many processes are SAP adjacent but go beyond it. Digital experience in the software ecosystem



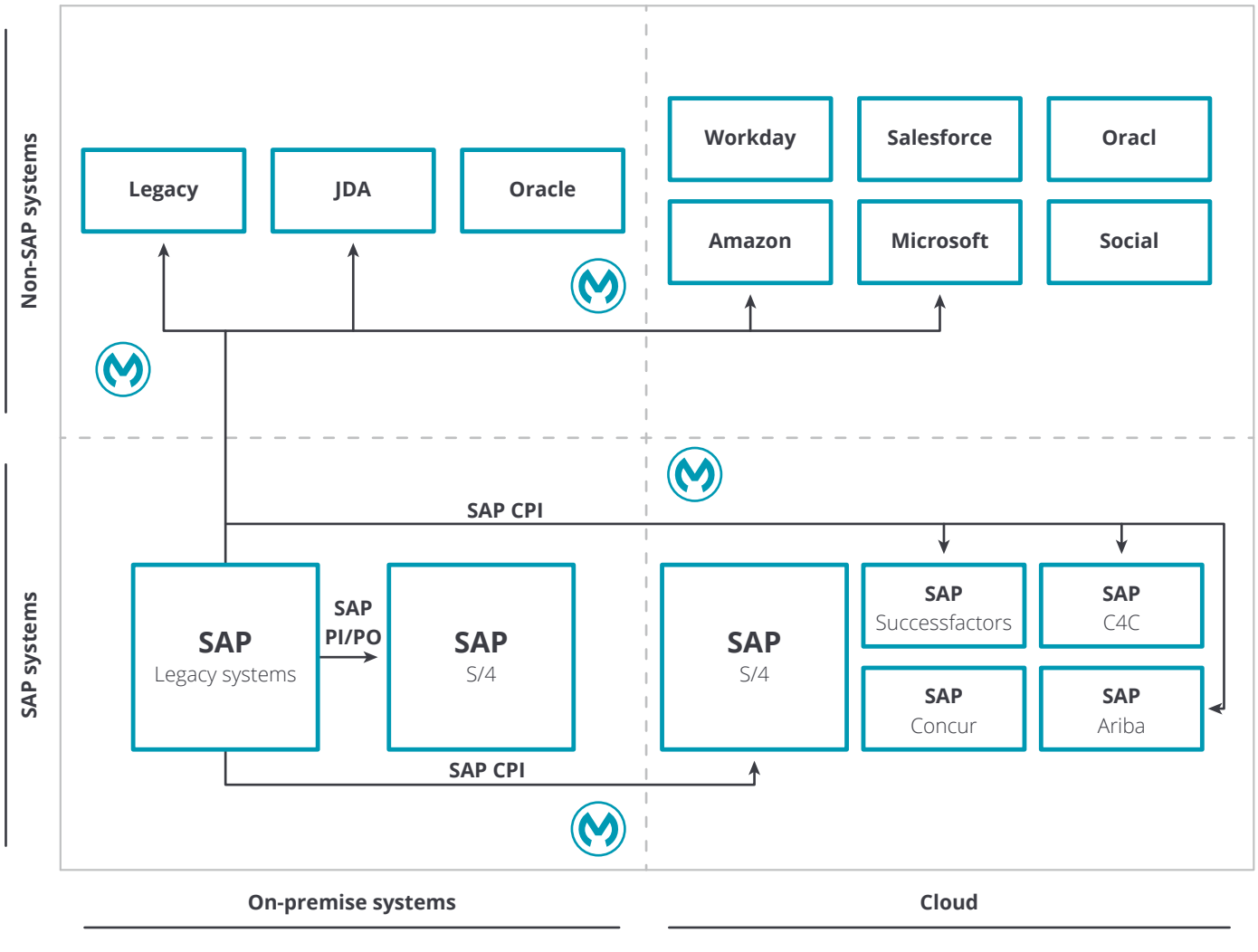
Over time, most SAP users have set up a large number of instances, some of which are running different releases of the software and adding further complexity to the IT architecture.

Even though the new version of SAP software offers a number of new features and is tailored to modern workflows, a lot of users see migration as a high-risk and high-cost endeavour – particularly when they consider the numerous customizations they will have to either reprogram or migrate to the new system in some complicated way. The challenge they face is how to integrate innovations from the new standard software with the existing processes they customized in house.

Ultimately, they probably will not be able to take full advantage of every new feature – without making it harder to generate the expected savings from cloud migration.

We recommend looking at SAP migration in the context of a more comprehensive modernization process of other systems. After all, today's business processes use dozens, if not hundreds, of additional standardized and custom software applications and databases outside the SAP universe. By exchanging existing SAP components and using a new SAP digital core, users run the risk of interrupting the end-to-end process flow.

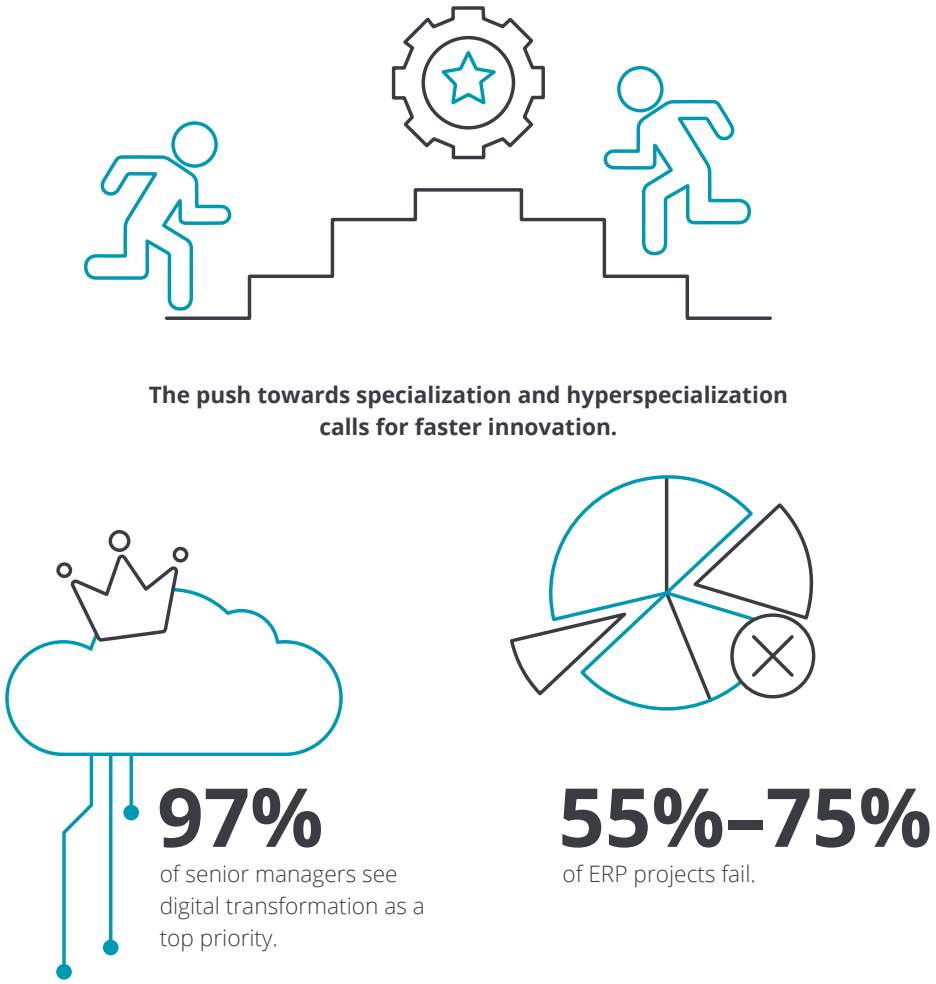
Fig. 3 – S/4 HANA interaction landscape with SAP & non-SAP systems



Today, we have a huge number of applications, data points and business processes connected by an almost infinite number of individual interfaces using different technologies. As a result, IT systems suffer from a lack of transparency, slow processing speeds and high failure rates, with most resources used to keep the existing landscape up and running.

Although virtually every company is undergoing some sort of digital transformation, surveys conducted by Deloitte indicate that approximately 55 to 75 percent of today's ERP projects are unable to achieve their stated goals.

Fig. 4 – Speed is key in the digital era



Actual IT speeds may vary

Different areas of IT have different needs when it comes to customizing the system architecture.

Once they have been set up, most standardized processes and systems in the ERP or CRM world are only customized or upgraded at long intervals, perhaps once per year. However, today's business processes are modelled on the core systems of a modern, digital business environment, and end up needing modification as often as once per month. There are even some processes that have to be planned, implemented and rolled out in just a few days or weeks, e.g., for mobile apps and seasonal web offers or in response to ad hoc events.

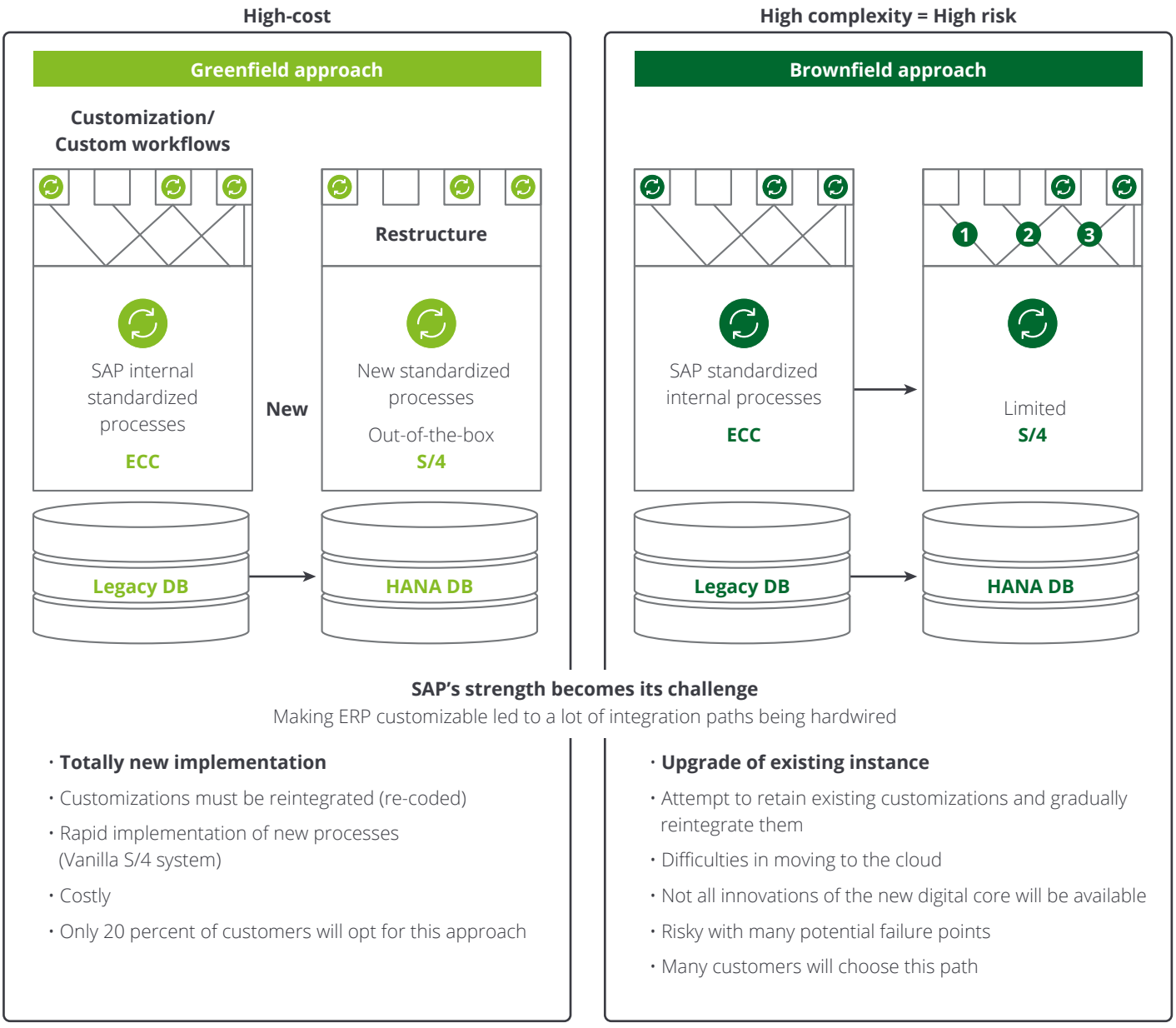
It is almost impossible to take an agile approach under these circumstances, particularly if you have to first locate an expert for each standardized system or convene several different experts just to develop one new process. The key priority moving forward will be to rigorously protect core systems, encapsulate the high-value data and processes they contain and to enable access via simple standardized interfaces.

As demands for digital processes get stronger, we have to speed up our response and integration times, but our IT systems are not always up to the task.

API: A lingua franca

Deloitte and MuleSoft offer an advanced approach for migrating legacy systems to new digital business models.

Fig. 5 – Comparison between the greenfield and brownfield approach



The new cloud-based standardized components of software platforms such as SAP S/4 HANA or Salesforce are best implemented with as few modifications as possible. This ensures that you can quickly and seamlessly implement future upgrades and keep your business model agile. This also makes it easier for you to take advantage of offerings from manufacturers or other partners that give you the cost-effective option of a third-party operating your software platform. The more a system has been customized for an individual user, the more complex and expensive it will be to operate over the long term.

The best solution is to define, develop and operate customizations and company-specific processes outside the software platform.

We can divide large-scale customizations and applications into smaller building blocks called microservices and put them in a standardized scaffolding that allows your system to access and control them. In today's IT landscape, that scaffolding is the API. Application Programming Interfaces (APIs) bundle existing functionality from the complex core system and make it available for queries in a simpler form. In this case, web developers with only a few days to create a new service don't have to be experts in the SAP data model or the SAP system to implement secure and speedy queries. The API essentially creates a layer of abstraction so that all of the participants in an application network speak the same language.

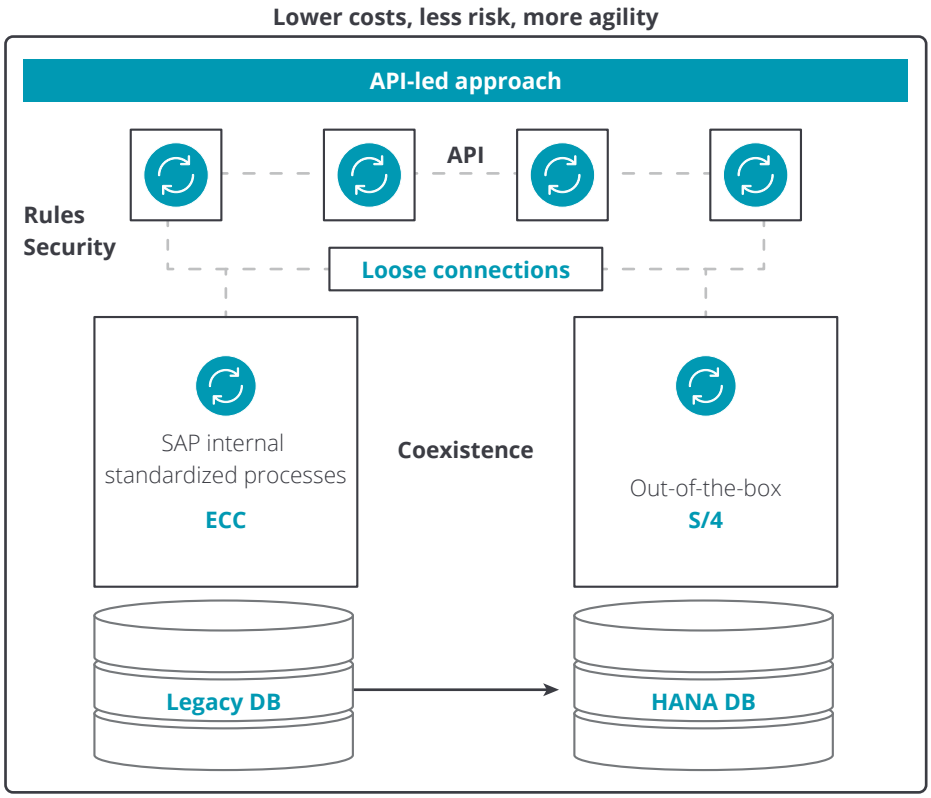
Stored and documented in an internal or external marketplace, APIs are easy to retrieve and reuse. This reduces IT project lead times and cuts costs.

APIs act as an interface in an application network, enabling users to solve security and oversight issues directly at the interface. All queries within the network have to pass through these interfaces, ensuring that the system only forwards authorized queries or that high query volumes, for example, don't overwhelm the underlying legacy systems.

This API-led approach opens up a broader future for the ERP landscape, where large monolithic systems can be broken into smaller units that are easier to maintain.

The old and new systems can coexist when they are connected via an API network, so we can implement upgrades and migrate data gradually. The API allows write and read processes to work with all systems, so we don't have to switch off a legacy system before confirming that the new version works for our everyday workflows.

Fig. 6 – API-led connectivity approach with MuleSoft

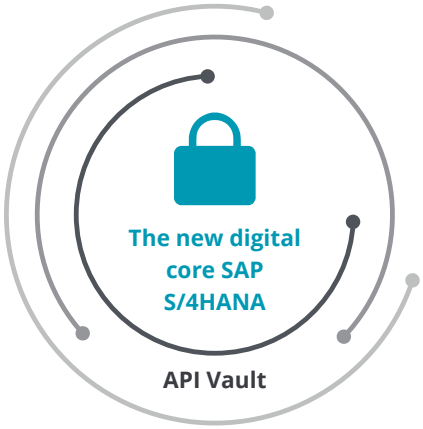


API-led connectivity allows us to decouple individual customizations from the underlying digital core. This process layer can communicate independently with existing and new core systems. Deloitte has created an extensive library of API artifacts based on the MuleSoft Anypoint platform. These artifacts describe a wide range of standard ERP processes and customizations and can be used with the new SAP digital core. The API vault, combined with proven implementation and operation methods, will accelerate development and mitigate migration risks.

In this scenario, customized process logic can be reused outside of the SAP universe, which means you can run S/4 with all of its innovative features. Removing certain customizations and building loose connections with the legacy and the new core system allows us to run hybrid scenarios. As a result, we can implement the new system on a gradual basis, while also improving oversight of the risk and costs. We have a great track record of successful migration projects using this approach.

Deloitte's SAP API VAULT

Fig. 7 – Deloitte's SAP API Vault



One of the most important issues in an S/4 HANA project is making sure that companies choose the most effective migration strategy and deploy it properly. The Deloitte SAP API Vault is a real accelerator in this process, enabling migrations to and from S/4HANA using an iPaaS and API management platform. Our vault is stocked with pre-built APIs and flows to accelerate the SAP migration process and quality is assured thanks to our long track record of tried and tested migrations.

Our API Vault has a wide range of integration assets created by Deloitte, which are critical for the implementation phase of Deloitte's migration method. Our migration approach combines Deloitte's extensive SAP experience with iPaaS tools like Mulesoft.

Mulesoft and Deloitte offer a wide range of SAP Integrations.

The SAP API Vault offers more than just a set of APIs.

Configurable RESTful API Suite
Using our extensive experience with migration projects, we put together a collection of RESTful-APIs that can be configured with SAP S4/HANA instances. This also includes the use of REST best practices as well as standardized interfaces and data types for all APIs. Our RESTful API Suite is available regardless of the middleware in use and on several iPaaS and API integration platforms. Thanks to the documentation provided on its functional and technical design, project teams can configure and upgrade interfaces for their customizations.

Up-front investment
Deloitte has invested over 900 person-days and worked with over 40 migration experts to develop, test and fine-tune our SAP API Vault, showcasing Deloitte's long track record of migrations with SAP and other systems.

Delivering better ease of use
By removing the complexity of the SAP interface, we can improve ease of use. Wherever possible, we have grouped the APIs based on the SAP object (e.g., general ledger), to achieve simultaneous functionality and simultaneous functions. Users can extend and customize the APIs depending on the customers' needs.

Common API frameworks and code templates
With reusable API and integration frameworks as the foundation, we can integrate elements such as common error handling processes, data profiles, API snippets and API fragments into your projects significantly faster. These integration processes are built using best practices and common integration models to provide more security and a clear roadmap for your new initiatives. Deloitte also supplies coding standards for developer templates and reusable naming conventions to help make the start to your project as smooth and speedy as possible.

Fig. 8 – API Vault – API Vault Architecture – SAP API Vault Accelerator

SAP
API Vault

Pre-built:

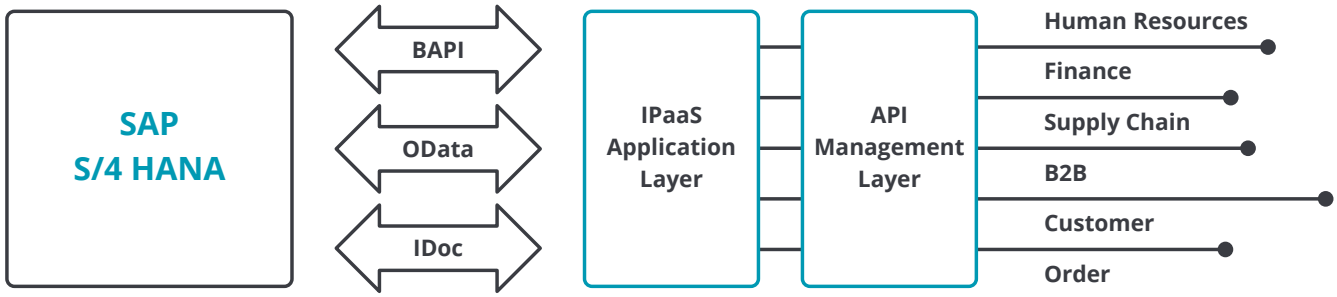
API Management Layer
- 80+ base APIs developed
- API specifications & developer API portals
- Authentication & access management

iPaaS Integration Layer
- Connectors to the back-end SAP platform
- Basic data transformation and validation
- Error handling framework implemented

SAP Configuration & Interfaces
- SAP Gateway configuration to connect with iPaaS platforms
- Consumed via IDocs, BAPI services and OData protocols

SAP
Cloud Platform
Integrations

Projektspezifische Konfigurationen
- Platform setup
- Configuration in line with client specifications
- Security rules to be implemented
- End-to-end tests



The core considerations in a migration project:

Costs
Migration usually accounts for around 30 percent of a transformation project's overall cost. SAP API Vault mitigates project risk using pre-built APIs.

Time-to-market
To speed up production lead times, it is essential to have an integrated solution. Our SAP API Vault accelerates the build.

Functionality
One of the advantages SAP has over other ERP platforms is the high level of functionality. SAP API Vault expands the platform's integration functions to deliver a reliable API layer.

API Vault cultivates an "API mindset" within your organization. Centralizing digital assets and SAP APIs on a single unified platform makes them easily accessible – a key enabler for digital transformation.

Business processes covered by API Vault

Today, API Vault has more than 150 APIs covering key business processes, which have already been implemented or are planned for 2021 On the basis of use cases from our clients and industries, we have developed a set of standardized APIs that target those processes with the greatest potential for simplification:

Fig. 9 – Developed and planned APIs as of July 1, 2020

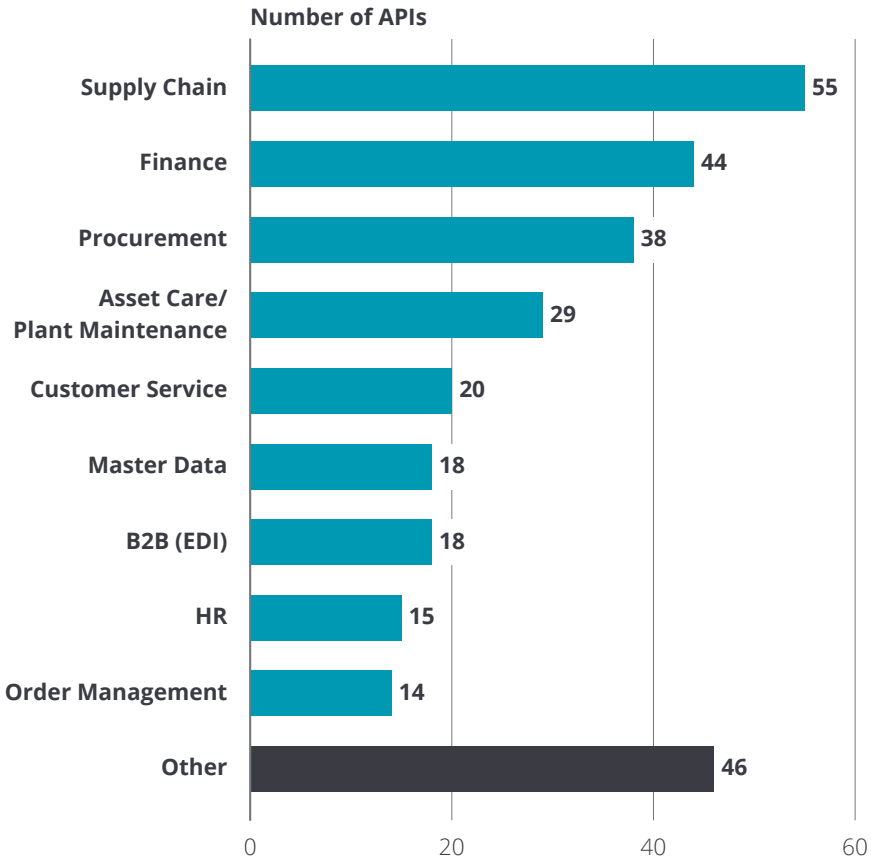
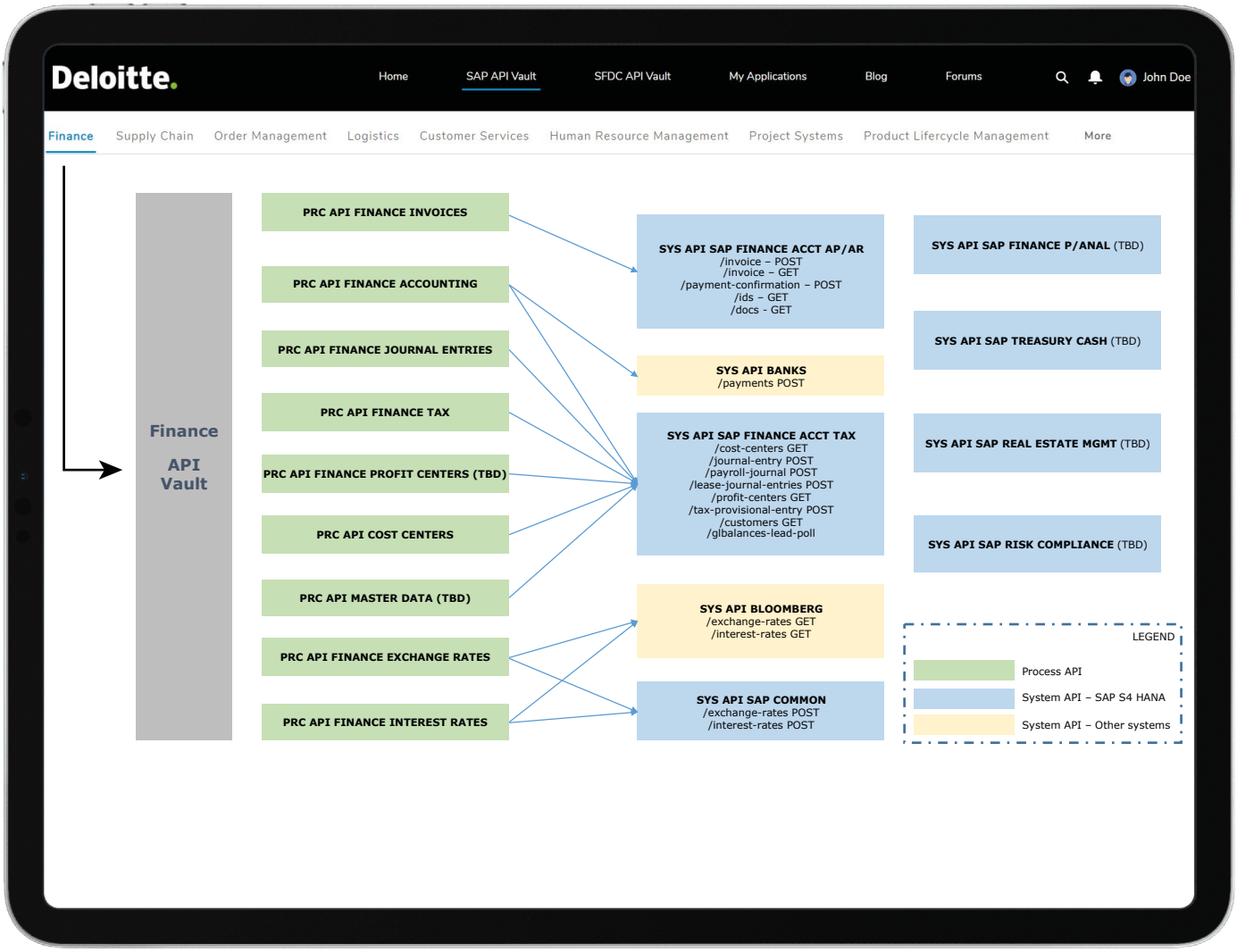


Fig. 10 – SAP S/4 Hana MuleSoft Finance Vault APIs



Deloitte offers a variety of reusable APIs for invoice creation in the SAP S/4 Hana system, for example, which were developed using MuleSoft Finance Vault APIs.

Deloitte Migration Methodology

Using the Deloitte migration methodology and our vast migration experience as a basis, we can reduce time-to-value for every client.

The core components include:

Consulting
In this step, we provide support with reference architecture, Point of View publications on migration, software selection criteria and frameworks, migration strategy documentation, as-is analyses, sample best practices for IT landscapes and Deloitte's so-called Lessons Learned publications.

Implementation
This step offers support with Deloitte's SAP Cloud Integration Vault, reusable migration utility program code, reusable artifacts from development documentation, reusable implementations of code middleware and SAP ERP systems and integration artifacts for cross-middleware technology support, primarily for Mulesoft but also for other integration platforms.

Operation
In this step, we provide support for automation of middleware cutover activities, consolidation of the error handling dashboard, monitoring of SAP and non-SAP middleware, reprocessing of SAP backend errors, reusable cutover templates, Hyper-Care Support documentation.

The SAP Cloud Integration Offering combines our specialized knowledge and experience in Cloud Integration and APIs with our deep technical SAP knowledge. Thanks to a large team dedicated to solving integration challenges and our vast resources including the API vault, we have what it takes to accelerate your client's SAP transformation journey. Get in touch with us and let us give you the support you need to accelerate your SAP Cloud Integration project.

Fig. 11 – API Vault – Integrationsmethodik von Deloitte

1. Consulting

- Reference architecture
- Migration vision
- Software selection criteria & framework
- Integration strategy documentation
- Actual/Target IT landscape use cases
- Sample best practices

Eminence Point of View
Reference architecture, software selection criteria

Integrationsergebnisse
Technical integration strategy/ documentation of the methodology

2. Implementation

- Deloitte's SAP Cloud Integration Vault
- Reusable program code
- Reusable artifacts from development documentation
- Reusable implementation of code middleware and SAP ERP systems
- Integration artifacts for cross middleware technology support in SAP PO, SCPI, Mulesoft, Apigee, Dell Boomi, etc.

SAP Cloud Integration Vault
for best practices on SAP to SAP Cloud, SAP to non-SAP, etc.

Acceleration
Creation cycle for new interfaces managed by the RPA process

Cross Middleware Technology Support
Integration artifacts in SAP PO, SCPI

3. Operation

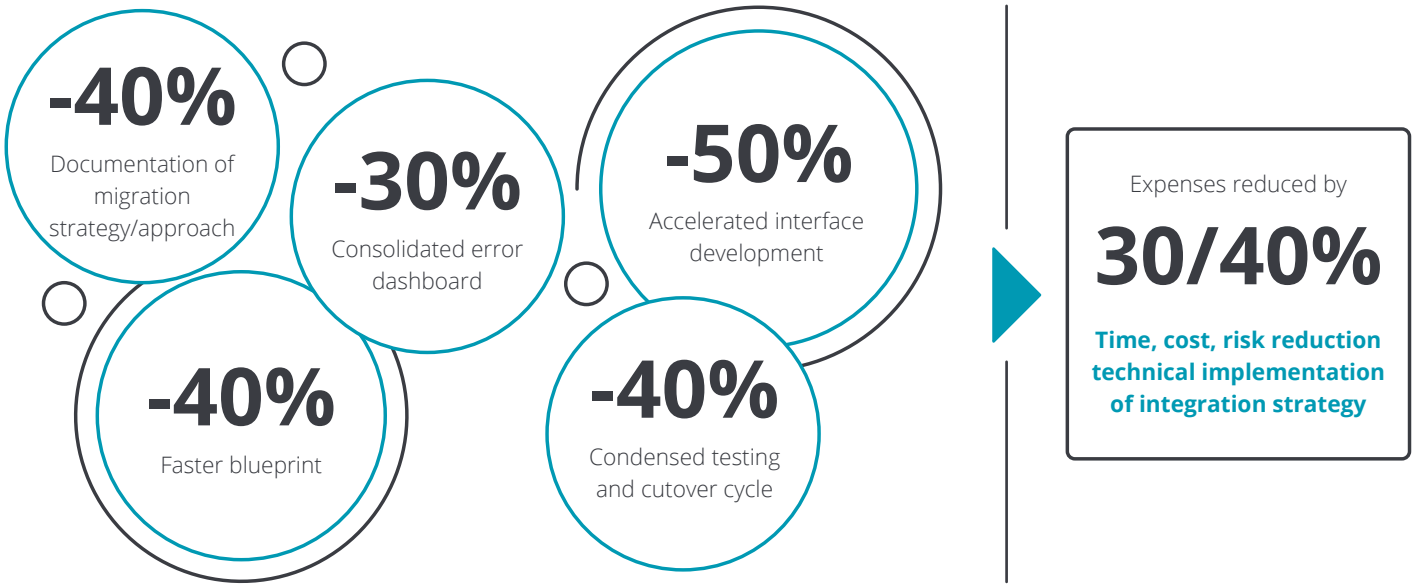
- Automated cutover activities
- Consolidated dashboard for error handling and monitoring of SAP and non-SAP middleware
- Reprocessing of SAP backend errors
- Reusable conversion and HyperCare support documentation

End-To End Monitoring
Consolidated dashboard for error handling and monitoring of SAP and non-SAP middleware

Faster Deployment Process
Accelerates middleware cutover with automation

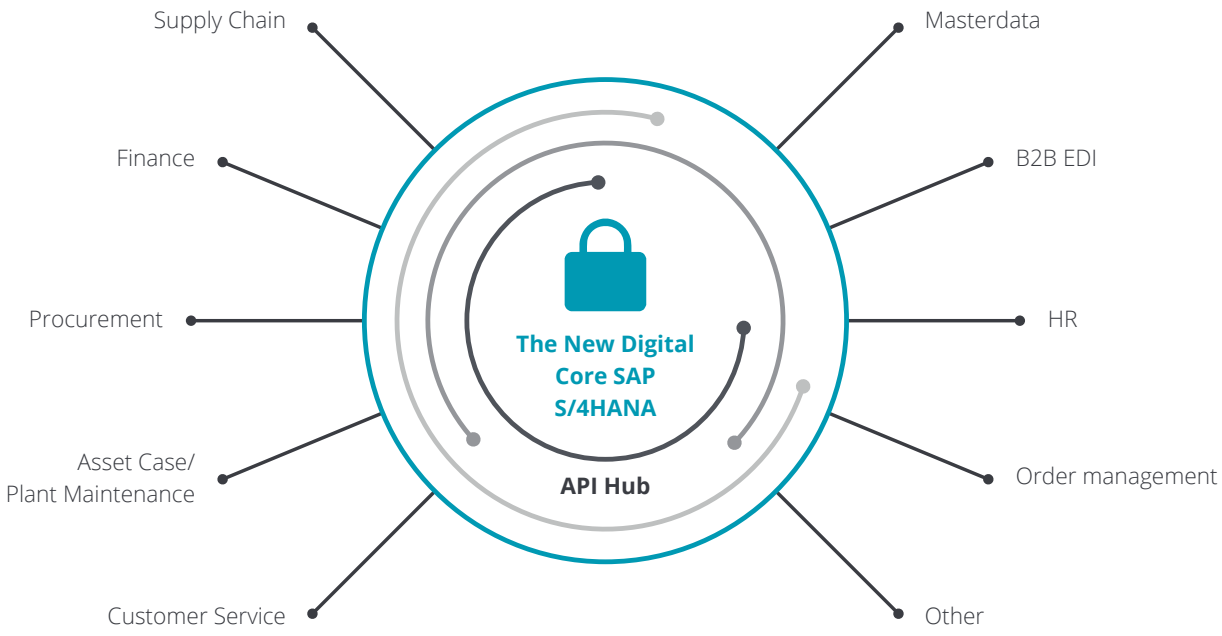
Reprocess & Monitor SAP Application errors

Fig. 12 – API Vault – Time Savings



Use our API Vault to introduce your first APIs for SAP.

Fig. 13 – Deloitte Integration Vault



Turn the systems migration process into a strategic competitive advantage.

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