



Dev4S4 | S/4HANA Cloud, ABAP Environment Bootcamp for Developers | Partner hands-on workshop





Clean Core Basics – Raja Prasad Gupta, Solution Architect

PUBLIC

SAP Global Partner Solution Adoption, 2023

Day2 Bootcamp agenda

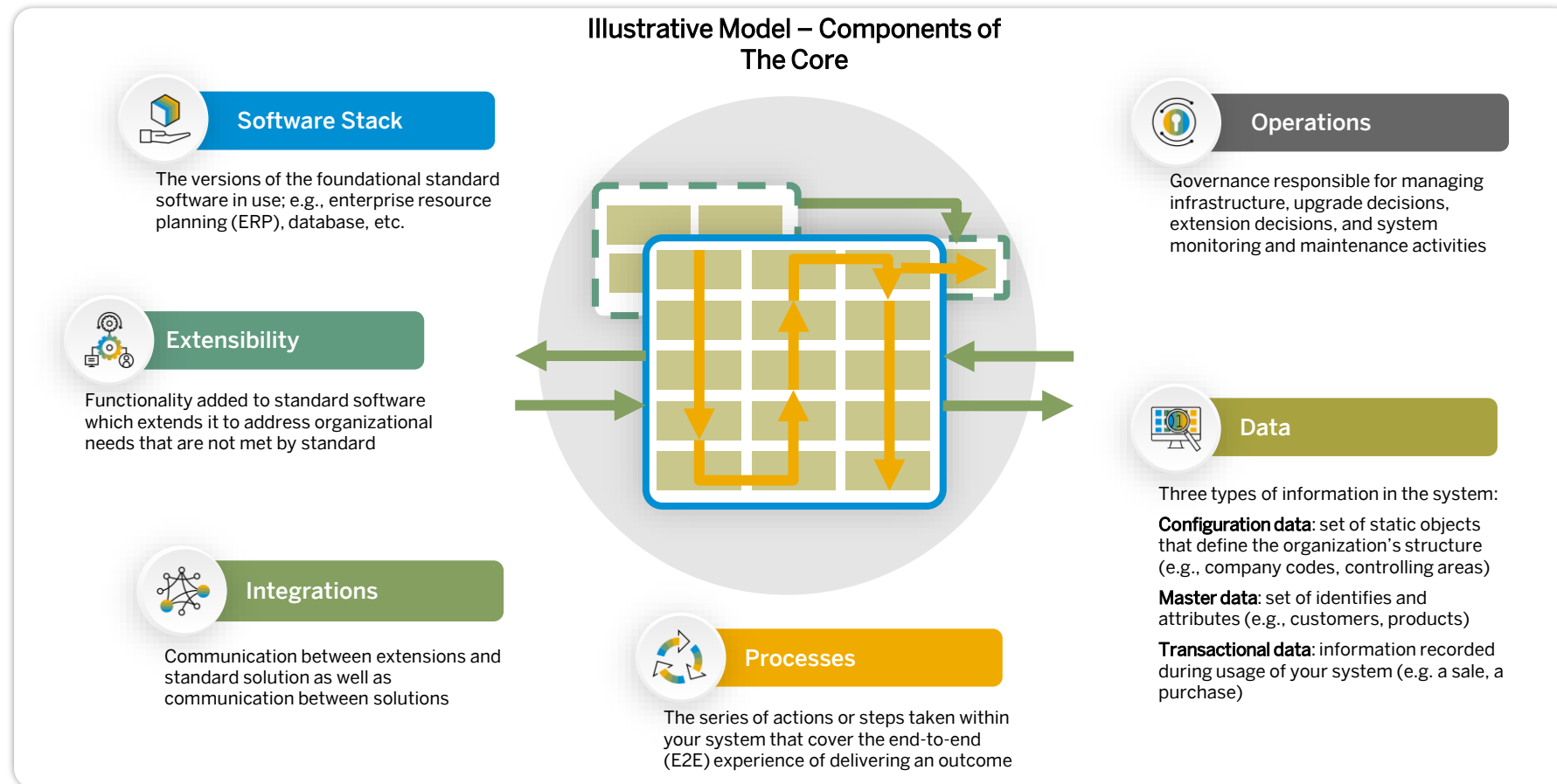
July 12, 2023

Topic		Duration	Relevance for Public/Private
00. Recap, Work zone, Agenda		15 mins	
01. Clean Core basics Clean Core definition, 3-Tier model		40 mins	Private
02. Lifecycle Management Transport Management in 3SL Landscape		45 mins	Public
Break		5 mins	
03. Code Migration ATC, code adaptation		45 mins	Both
04. Exercise 2 (Introduction) Build a custom API for side-by-side extensibility		15 mins	Public
05. Exercise 3 (Introduction) Migrate code to S/4HANA		10 mins	Both, valid for ECC migration (if you need more on ECC - >S/4 utilize 10steps2S4
Feedback		5 mins	
Offline exercise work Q&A support via SAP Workzone		3 hours	

A “core” forms the foundation of IT’s capability to enable the strategy

It refers to the components used to provide capability through an ERP system

We consider six components when discussing the core of an organization. These technical and procedural considerations interact to provide the capability to your business so you can deliver outcomes.



Through the course of running the business and adapting to new requirements, variations are often introduced on each of these. However, to maximize cloud readiness, organizations must strive to keep each of these components as clean as possible.




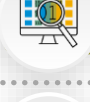


"Clean Core" - A Concept to achieve modern, flexible and cloud compliant ERPs

Clean core is an **extension methodology** where

- ❑ Extensions are kept **strictly separate** from the SAP application.
- ❑ Extensions access SAP business objects **only through well defined, upgrade-stable interfaces**

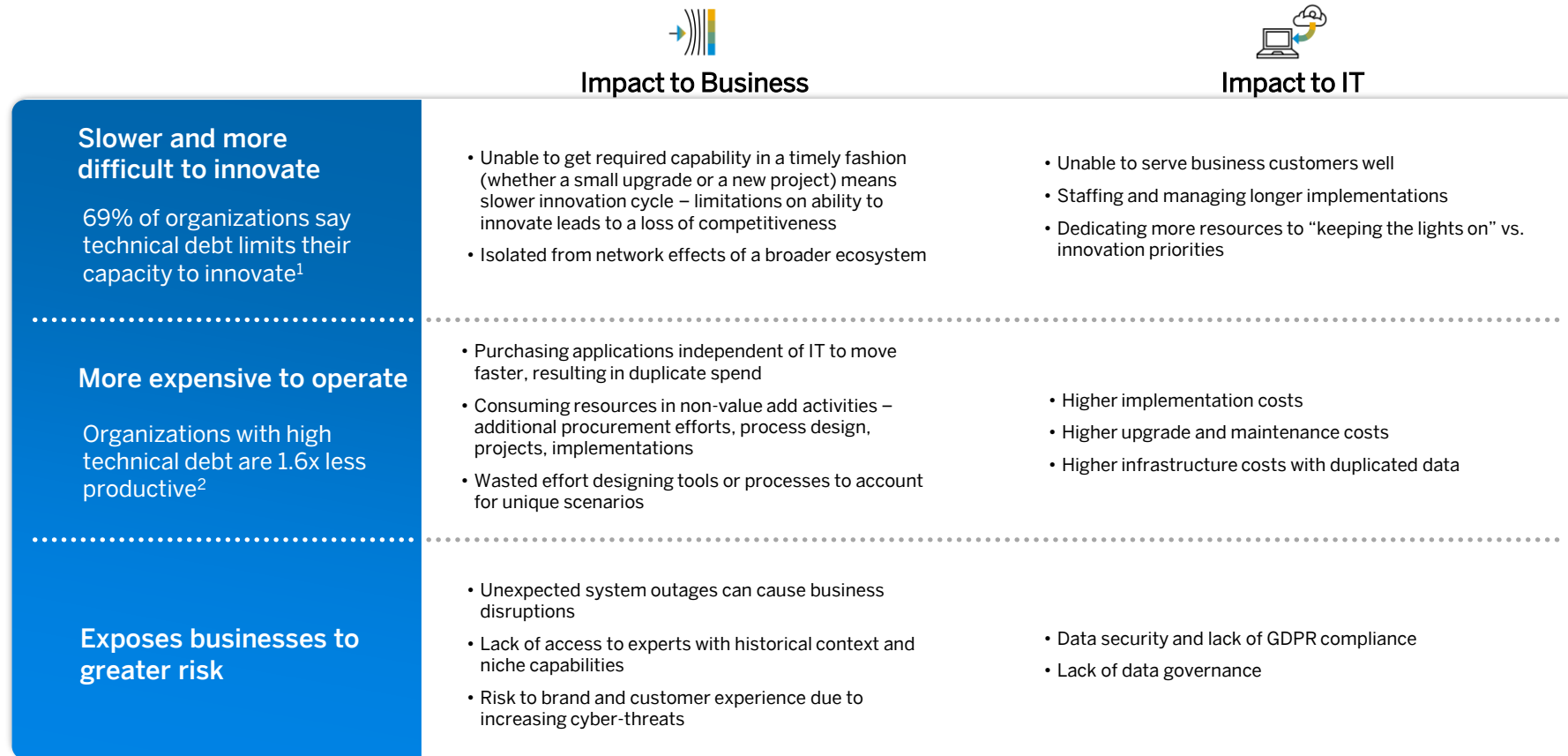
Criteria for "Clean Core"

Often a clean core is thought to be a system devoid of core customization. However, being truly “clean” actually includes adhering to standardized guidelines for all elements of the core. With that, when it comes time to upgrade a system, changes can be put in place without significant manual efforts to test and adapt existing structures.

Element of the Core	Criteria for Clean Core
 Software Stack	<ul style="list-style-type: none">• Software version close to the latest release• Software version close to the latest Feature Pack Stack (FPS) and Support Pack Stack (SPS)• Partner solutions clean core compliant
 Extensibility	<ul style="list-style-type: none">• Upgrade-stable extensions following prescribed extensibility model• Only actively-used and well-documented extensions• Adherence to general code quality standards and best practices• No duplication of SAP standard functionality
 Integrations	<ul style="list-style-type: none">• Upgrade stable interfaces• Proper monitoring and error resolution capabilities• Only actively-used and well-documented integration
 Data	<ul style="list-style-type: none">• Complete• Correct• Used and relevant
 Processes	<ul style="list-style-type: none">• No inconsistent or inefficient processes• Leveraging SAP recommended Best Practices
 Operations	<ul style="list-style-type: none">• Day-to-day operations are planned and executed regularly to maintain alignment with the above-mentioned guidelines (e.g., security authorizations, integrations, data, etc.)• Opt-in on lifecycle events such as periodic upgrades• Compliance with pre-approved maintenance windows




Organizations may not be able to achieve a perfectly clean core. However, the more organizations can incorporate these elements into their landscape, the more benefits they can realize in business performance and cloud delivery.

Challenges faced by Organization if Clean Core is neglected



These challenges will only be further exacerbated as the pace of change continues to increase. Organizations can mitigate these challenges and respond effectively to macroeconomic changes by creating competitive advantage in a way that is self-sustaining.

Organizations can avoid challenges resulting from the neglect of a clean core and enable business value at the same time

Challenges of Neglecting a Clean Core	How to Mitigate Challenges	Business and IT Benefits
 Slower and more difficult to innovate	<ul style="list-style-type: none">• Stay close to the latest product release to benefit from the latest innovations from SAP• Run non-differentiating processes according to recommended best practices, so that you can focus more on business differentiators• Leverage in-app, side-by-side, hybrid, and developer extensibility options to innovate quickly based on business and technology needs	<ul style="list-style-type: none">• Reduce time-to-market for new products/services• Increase revenue from new business models• Reduce application development time
 More expensive to operate	<ul style="list-style-type: none">• Adopt only those 3rd-party solutions that are compliant with the clean core guidelines, allowing you to reduce maintenance costs• Integrate using upgrade stable interfaces for inter-application connectivity to reduce upgrade cost• Leverage a common domain data model between different solutions to avoid data redundancy and inconsistencies	<ul style="list-style-type: none">• Reduce testing time on upgrade projects• Reduce developer effort on code adaptation• Reduce data integration cost• Reduce cost of poor data quality
 Exposes businesses to greater risk	<ul style="list-style-type: none">• Follow recommended Reference Architecture for cloud solutions to ensure easier adoption, consistency, and system stability• Manage security authorizations actively to avoid inactive users and unused authorizations• Leverage whitelisted APIs with monitoring and error resolution capabilities to run seamless processes with confidence	<ul style="list-style-type: none">• Reduce un-planned downtime or outages• Reduce data security cost• Reduce risk of data non-compliance losses

By following the standardized guidelines of a clean core, both business and IT can realize monetary and strategic benefits.

Clean Core Paradigm - Benefits

- **Reduce TCO**

- Make upgrades non-events from a custom code point of view
- Reduce test efforts for business users
- Reduce adaption efforts for developers
- IT service providers can offer upgrade projects at a fixed price

- **Speed and Innovation**

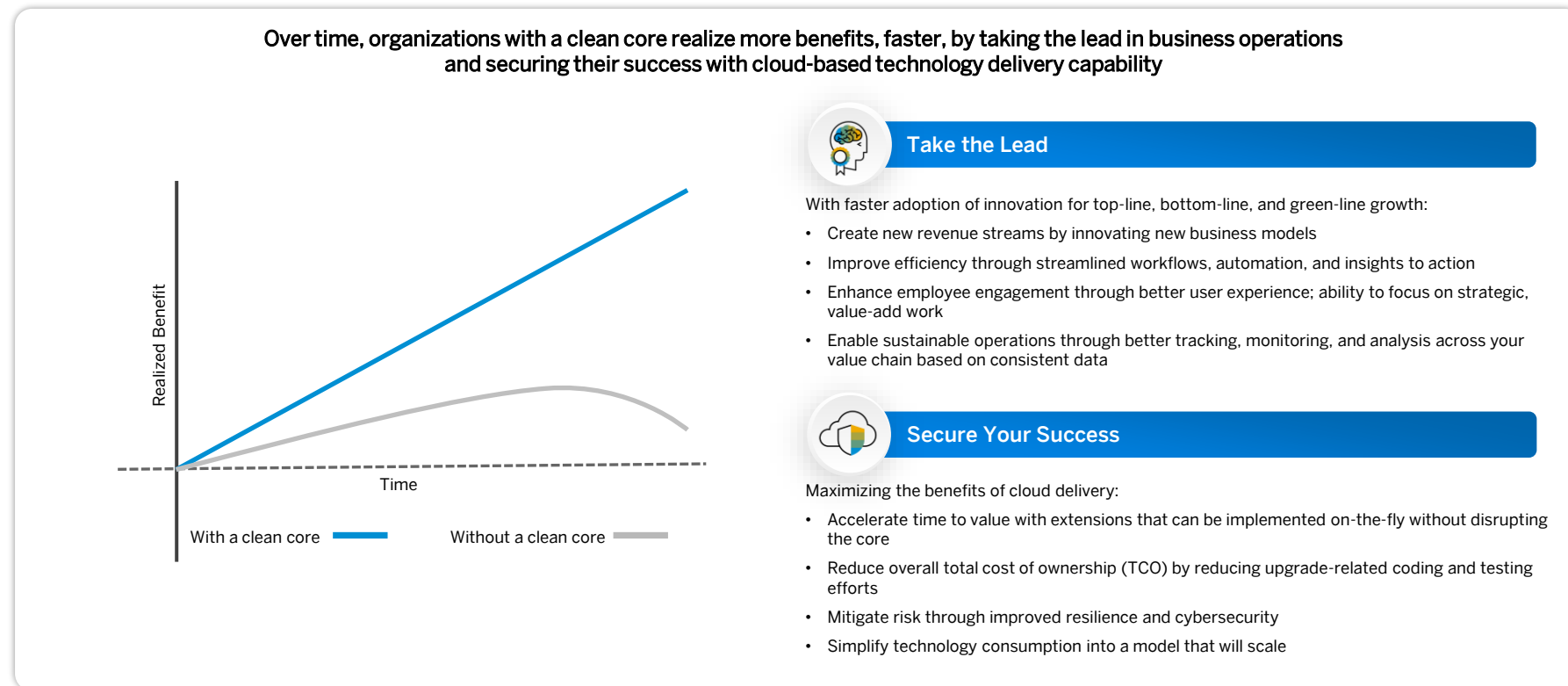
- Absorb innovation delivered by SAP at a faster rate
- React fast on changing business requirements

- **Be cloud ready**

- Lay the foundation today to move to the cloud from a custom extension perspective

Clean Core sets the foundation for the Future

Following standard guidelines to innovate makes it possible to create a competitive advantage while avoiding technical debt



The benefits of a clean core are apparent. However, the path to achieving this end state can be complex.

Moving towards a clean core first requires an overall strategic direction

Organizations must begin by understanding the amount of change required and how quickly it must be realized

Amount of Change

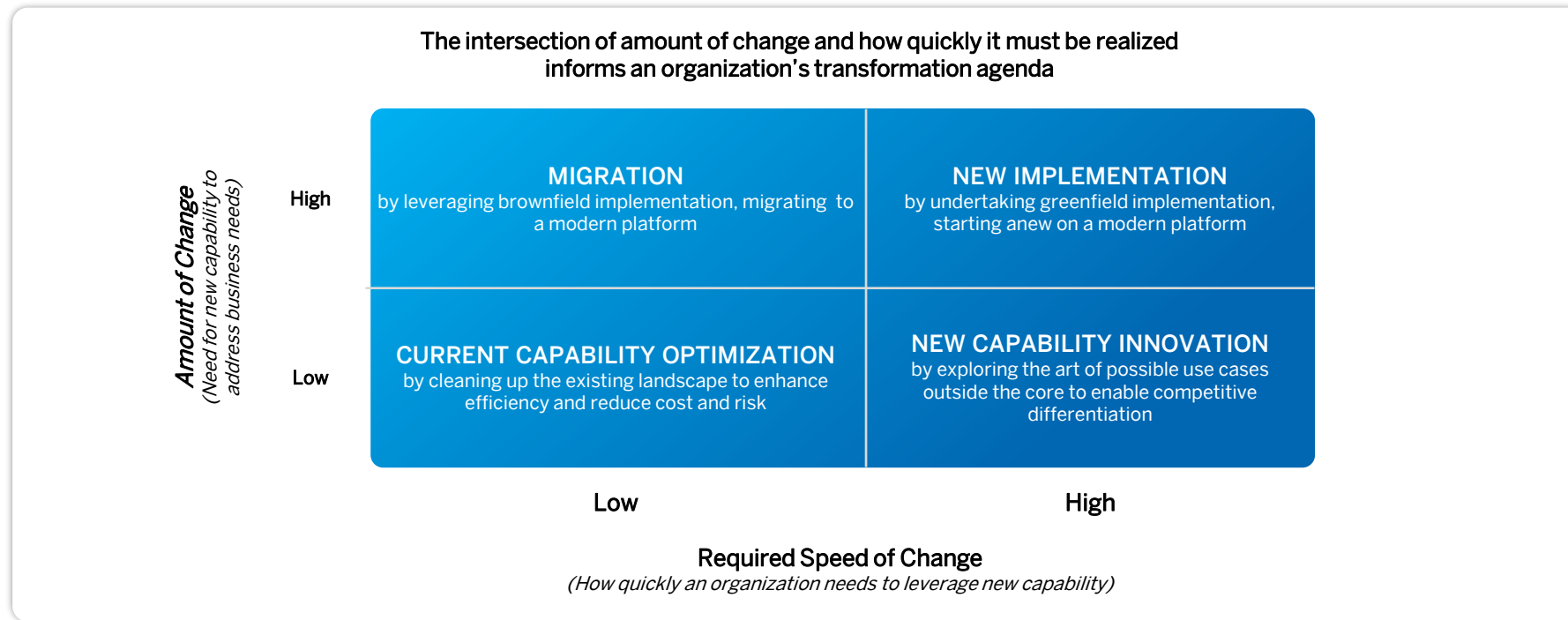
Organizations with a high need for new capability to address business needs will consider a project to move to a modern ERP. Those who already have sufficient capability will focus on optimizing or innovating in the current environment.

Required Speed of Change

Those who need to innovate faster to respond to market conditions will have to move to modern platforms to gain new capabilities, while those in with a slower imperative for change will want to improve access to existing capabilities.

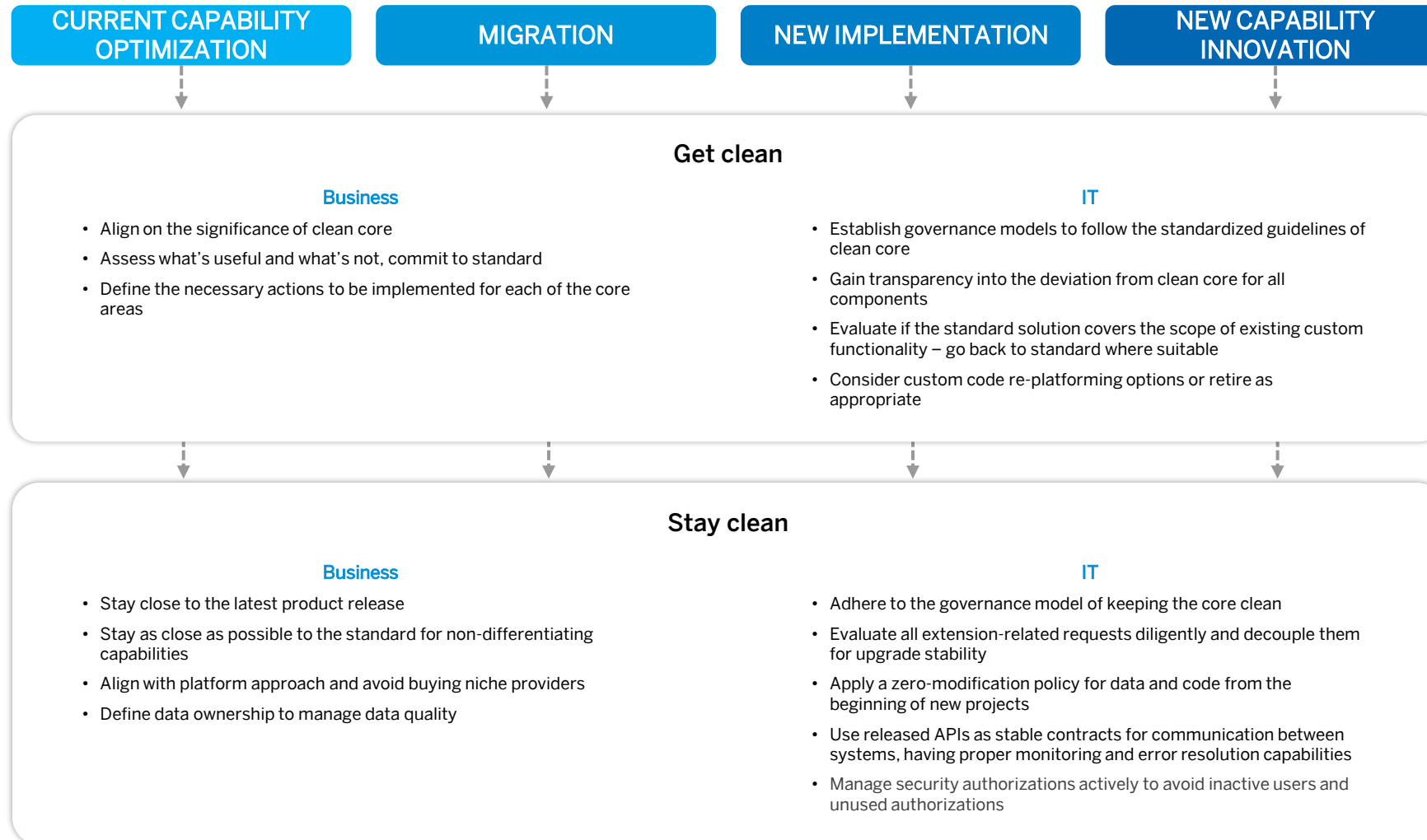
These factors will determine whether you focus on optimizing your core, migrating to a new landscape with reduced complexity, transforming through an entirely new greenfield system, or innovating differentiating capabilities outside the core.

Moving towards a clean core first requires an overall strategic direction



Understanding this high-level strategic direction will inform the specific actions required to maximize agility in the short term and prepare for future initiatives such as a move to the cloud.

After defining strategic direction, organizations must take action



SAP customers are realizing business and IT outcomes

By simplifying their landscapes and applications

HIGH TECH



Key Challenges

- Significant technical debt and high total cost of ownership for IT and operation
- Different systems and processes across regions that prevent a consistent customer experience

Transformation Type: Migration

Key Transformation Benefits

- Reduced customizations to less than **10%**
- Simplified and unified processes and reduced the application landscape by half
- Increased on-time delivery from **90% to 99.5%**
- Decreased quote time from **3 hours to 15 minutes**
- Reduced month-end close from **11 days to just 5 days**

[Click here](#) for more information

LIFE SCIENCES



Key Challenges

- Support requirements were high due to custom applications in the previous system
- The IT team was unable to implement and take advantage of new features in later releases

Transformation Type: New Implementation

Key Transformation Benefits

- **88%** of customizations reduced
- Uptime grew from 90% to 99.8%
- **79%** system outages dropped 79% - from 7 hours per quarter to 90 minutes
- 4,000 number of records reduced by choosing a Greenfield vs. Brownfield implementation

[Click here](#) for more information

TELECOMMUNICATIONS



Key Challenges

- Mass customizations that created a cumbersome upgrade process
- Suboptimal access to information for insights from its legacy ERP application

Transformation Type: Migration

Key Transformation Benefits

- **>70%** of core business processes automated
- **~85%** of core business processes standardized across 24 countries
- Optimized maintenance and system performance through improved standardization
- Improved employee Net Promoter Score related to a better user experience
- Faster month-end close cycles

[Click here](#) for more information

MILL PRODUCTS & MINING



Key Challenges

- Disconnected systems, processes, and data that slow reporting, impede inventory management, limit supply chain visibility, impact deliveries...
- Complex landscape requiring redundant, error-prone IT admin

Transformation Type: Migration

Key Transformation Benefits

- Harmonized processes and data that increase efficiency – including 20% less time for invoicing
- **33%** reduction in the number of interfaces
- **50%** reduction in database size for lower cost of ownership
- **30%** less manual reconciliation in finance
- **25%** reduction in PO errors

[Click here](#) for more information

Clean Core in SAP S/4HANA

SAP's rationale behind the “clean digital core” paradigm is:

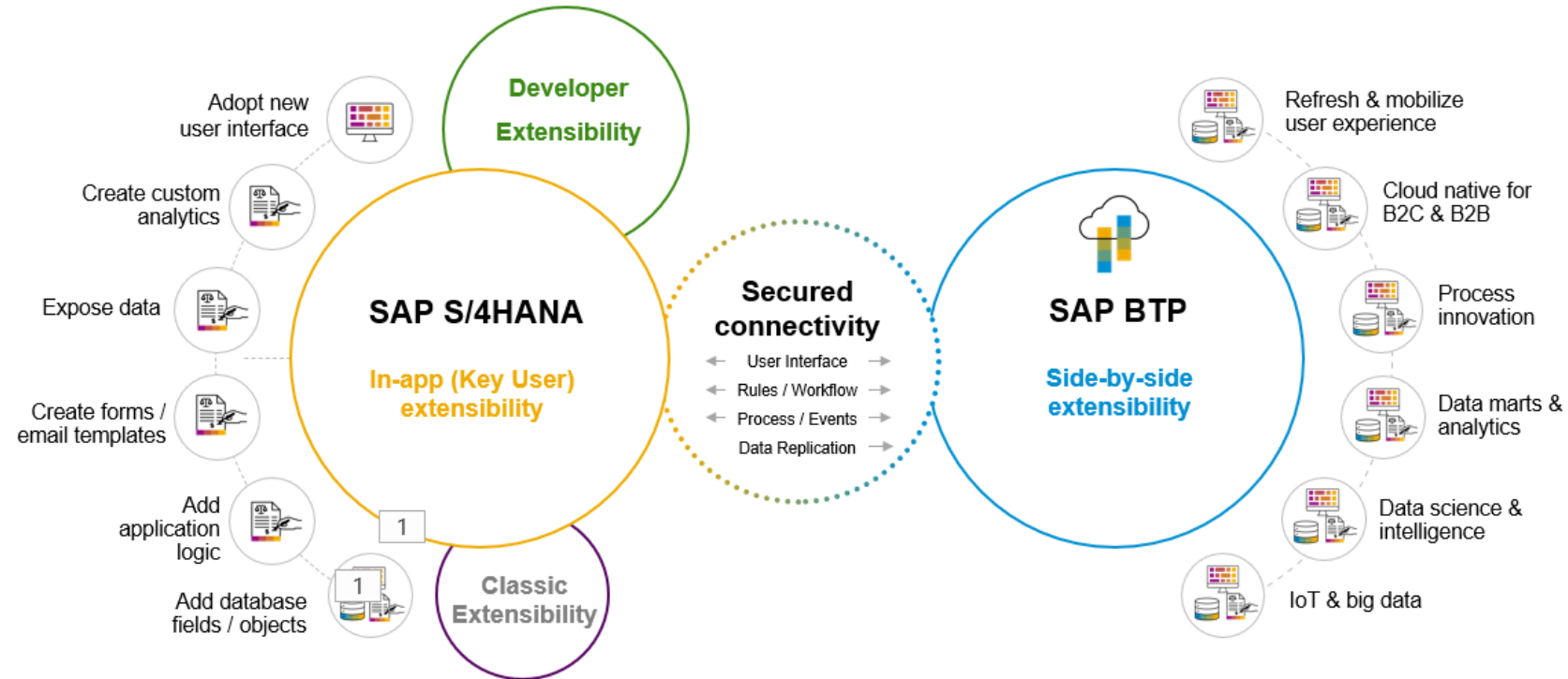
Allow customers to extend their SAP S/4HANA software while making the software updates eventually non-events.

By following clean core paradigm you make sure that

- ❑ **Extensions should not break an upgrade** and **upgrades should not break an extension.**
- ❑ Extensions does not create a problem when you **move from SAP S/4HANA on-Premise to SAP S/4HANA Cloud**

Guidelines from SAP - Leverage Modern S/4HANA Extensibility Options

- ❑ Don't adhere to classic extensibility options such as traditional SE80
- ❑ Realize the full potential of approved extensibility options
- ❑ Leveraging the in-app and developer extensibility to its full extent
- ❑ Employing the capabilities offered by SAP BTP to build side-by-side extension applications



Guidelines from SAP - Zero Core Modifications

- ❑ Apply a “zero-modification” policy from the project’s first day.
- ❑ Modifying SAP standard **should be treated as a prohibition**, as these causes regression and hiccups during system upgrades, shooting up the testing efforts for each upgrade cycle.
- ❑ In case of exceptions, modifying SAP standard artifact should be last resort for any implementation team.
- ❑ If at all modifications exists, for historical or unavoidable factors, the teams must engage in stringent quality processes such as maintaining automated unit tests for each core modifications like user exits, and undergo thorough regression tests upfront.

Guidelines from SAP - **Fit-to-standard as much as possible**

- ❑ **Fit to standard** business processes as much as possible.
- ❑ Don't re-inventing the wheel, rather **adapt standard solution leveraging available configuration options** to support the customer's business necessities.
- ❑ This includes utilizing the standard scope items and usage of released APIs to integrate with other systems (SAP/non-SAP).
- ❑ Fitting-to-standard also helps to avail new innovative features from SAP, like SAP iRPA, SAP Conversational AI and other ML driven capabilities.
- ❑ It aids in future-proofing businesses, besides other benefits such as reduced implementation time and cost of ownership.

Guidelines from SAP - Handling Indirect Modifications to SAP Standard

- ❑ Cloned programs (copies of SAP Standard objects) often cause maintenance difficulties, as they aren't easily detected upfront during conversions/upgrades, which is why they pose risk to system stability.
- ❑ Custom object repositories can be scanned deeply for their resemblance to SAP standard objects.
- ❑ Upon identification and review, these clone custom objects should be replaced (revert back) with SAP standard code, unless re-cloning is absolutely required.
- ❑ Addressing this would contribute in stable upgrades, and also eliminate redundant custom objects.

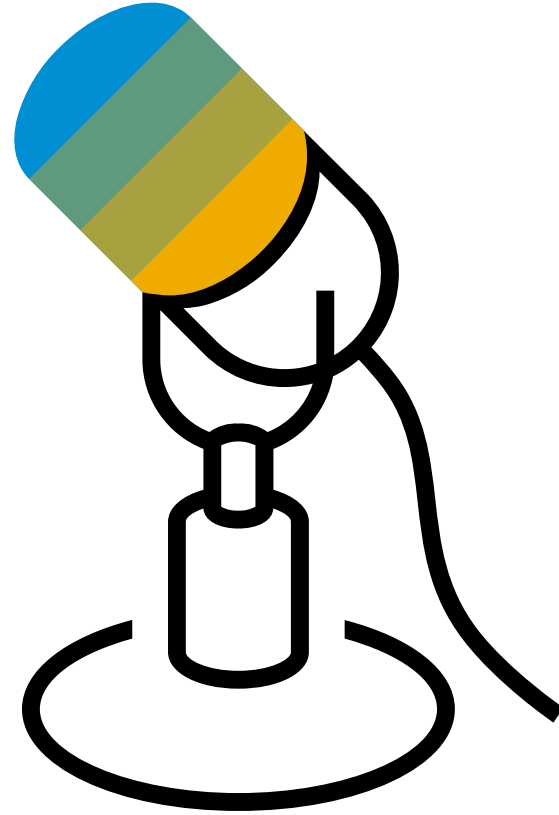
Guidelines from SAP - **Analyze Usage Data and Retire Unused Objects**

- ❑ Research articles indicate that as much as 40-60% of custom code is not executed in production environments
- ❑ Analyze and retire unused custom objects from the core.
- ❑ This contributes to keep the core SAP system lighter and cleaner.

Guidelines from SAP - **Lean and Upgrade-proof Data-models**

- ❑ SAP offers powerful data-modeling utilities such as Core Data Services (CDS) views and whitelisted APIs.
- ❑ Usage of released standard CDS Views are recommended. For example, I_CUSTOMER or I_SUPPLIER in place of KNA1 and LFA1 respectively.
- ❑ Usage of upgrade-stable standard objects such as CDS view do not break an upgrade and upgrades do not break extension”.
- ❑ Using released APIs only; Use SAP API Business Hub to explore these.

Q & A



Resources

- [SAP S/4HANA Extensibility – Simplified Guide for Beginners](#)
- [Custom Extensions in SAP S/4HANA Implementations](#) - A Practical Guide for Senior IT Leadership
- [API Business Hub](#) - Discover and consume digital content packages with APIs and pre-packaged integrations from SAP and select partners
- [Key User Extensibility Apps](#) S/4HANA On-Premise
- [Key User Extensibility Apps](#) S/4HANA Cloud
- [SAP Note 2920697](#) - Extensibility Guide for SAP S/4HANA Cloud, extended edition
- [SAP Extensibility Explorer for SAP S/4HANA Cloud](#) - Explore In-App and Side by Side Extensibility Patterns.
- [Roadmap Explorer](#) - SAP Road Maps support the journey to SAP's future product portfolio and the Intelligent Enterprise.

Thank you.

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