Building a Resilient SAP Enterprise

Build a resilient SAP enterprise in the era of RISE, GROW, and cloud-native services

Soulat Khan

Sunny Patwari

Ganesh Suryanarayanan

www.bpbonline.com

First Edition 2025

ISBN: 978-93-65895-490

LIMITS OF LIABILITY AND DISCLAIMER OF WARRANTY

The information contained in this book is true and correct to the best of author's and publisher's knowledge. The author has made every effort to ensure the accuracy of these publications, but the publisher cannot be held responsible for any loss or damage arising from any information in this book.

All trademarks referred to in the book are acknowledged as properties of their respective owners but BPB Publications cannot guarantee the accuracy of this information.

Dedicated to

Our families for their patience,
our mentors for their encouragement,
and our friends for challenging us

About the Authors

- **Soulat Khan** is currently working as the worldwide leader for SAP solution architecture for customers, and partners and managed the technical alliance for SAP at **Amazon Web Services** (**AWS**). Soulat is a recognized expert in SAP cloud transformations having spoken at Americas SAP user group conferences, AWS re:Invent, and numerous industry events. With over 20 years of enterprise technology experience, he specializes in helping organizations modernize their SAP landscapes and build resilient cloud architectures. This book reflects his practical experience and strategic insights in building future-ready SAP enterprises, combining deep technical knowledge with business-focused outcomes.
- **Sunny Patwari** is an SAP leader at Amazon Web Services (AWS), specializing in FinTech and currently overseeing SAP implementations for AWS Infrastructure Finance and Supply Chain. Previously, he led the Worldwide Strategic Alliance for SAP at AWS and served as a subject matter expert for RISE with SAP and Business Technology Platform. With deep expertise in architecting and delivering complex, global SAP transformations, Sunny has supported organizations across a wide range of industries, including semiconductors, pharmaceuticals, aerospace, and defense. He has worked closely with customers in diverse market segments to accelerate their cloud migrations using RISE with SAP and Cloud native services.
- **Ganesh Suryanarayanan** serves as a Principal SAP Innovation Architect at AWS, where he crafts sophisticated ERP solutions for global enterprises. His unique ability to harmonize SAP processes with AWS capabilities helps organizations achieve their digital transformation goals while optimizing both performance and cost. This book reflects his practical experience and strategic insights in building future-ready SAP enterprises, combining deep technical knowledge with business-focused outcomes.

About the Reviewers

- **Sriharsha Narasimhan** is a strategic leader, board director, and certified independent director with over 37 years of global experience in digital technologies, corporate governance, digital transformation, risk, and cybersecurity. He is an expert in aligning technology strategies with regulatory mandates and advises C-level executives of financial institutions. Sriharsha has a proven track record in implementing mission-critical infrastructure projects that deliver operational resiliency and foster innovation through collaboration.

  As the former CTO for Mission Critical Solutions and Aruba Networks at Hewlett-Packard Enterprise, Sriharsha collaborated closely with C-suite executives and ecosystem partners to formulate and execute holistic strategies aligned with the business vision and objectives. He has extensive experience in building scalable, secure, and operationally resilient solutions for HPE's infrastructure offerings, particularly for SAP ECC and SAP HANA requirements. Notably, for the BFSI vertical, he has architected mission-critical and highly scalable infrastructure for debit card/digital payments and core banking systems. Additionally, Sriharsha has developed competencies in automation, digital experiences, AIOps, cybersecurity, IT/OT integration, and IoT. In his spare time, he reads fictional, comics, and technical books and listens to international music.

- **Jeyaganesh Viswanathan** is a seasoned SAP Solution Architect with over 20 years of extensive experience in implementing and managing complex SAP environments. Currently serving as IT Lead at Zoetis Pharmaceutical, he architects enterprise-wide SAP with deep integration experience across SAP Products.

  As a certified SAP professional, Jey has led transformative projects for industry giants, including L'Oréal, Apple, BASF, and Wolters Kluwer, orchestrating SAP implementations across 45+ countries.

A published author with SAP PRESS, Jey has written on SAP ACTIVATE methodology and contributed research papers to peer-reviewed journals focusing on AI, Robotic Process Automation, and SAP advanced variant configuration systems. His ability to bridge theoretical concepts with practical implementation has established him as a thought leader in the SAP community. Throughout his career, Jey has demonstrated exceptional leadership in managing cross-functional teams and driving innovation, consistently delivering results that align with organizational objectives.

Acknowledgements

This book is a labor of love, a testament to the passion we hold for our work and the cherished relationships we have built with partners, customers, and colleagues throughout our years in the SAP ecosystem. Every page reflects countless conversations, shared challenges, and collective victories that have shaped our understanding of enterprise transformation.

First and foremost, we extend our deepest gratitude to our families. Their understanding during the long hours, their unwavering support through missed dinners and working weekends, and their constant encouragement as we documented our experiences have been the foundation of this endeavor. Their love has been our anchor throughout this journey.

At its core, this book is about building a resilient SAP enterprise, a vision that would not be possible without acknowledging SAP itself, a pioneering force that continues to transform business processes globally. For nearly five decades, SAP has not just developed software; it has revolutionized how organizations operate, adapt, and thrive in an ever-evolving business landscape.

To our customers and partners: your trust in allowing us to be part of your transformation journey has been our greatest privilege. Every challenge you have shared, every success we have celebrated together, and every lesson we have learned collectively has contributed to the insights within these pages. Your willingness to let us guide you through complex transformations has enriched our perspective, and we're honored to share these experiences with a broader audience.

We are profoundly grateful to BPB Publications for their exceptional guidance and expertise. Their unwavering support transformed our vision into reality, helping us navigate the intricacies of the publishing process with precision and care. Their commitment to excellence mirrors the high standards we strive for in our professional endeavors.

Special appreciation goes to our reviewers, technical experts, and editors whose meticulous attention to detail and insightful feedback have elevated this manuscript. Their expertise has helped ensure that our practical experience translates into actionable knowledge for our readers.

This book represents not just our knowledge, but the collective wisdom of a community dedicated to excellence in enterprise transformation. Together, we continue to build more resilient, efficient, and successful businesses through the power of SAP.

Preface

The landscape of SAP development and implementation is undergoing its most significant transformation since the introduction of ABAP in the 1980s. As we navigate this pivotal shift toward cloud-native solutions and software-as-a-service offerings, SAP professionals face both exciting opportunities and complex challenges. This book serves as your comprehensive guide through this evolution, particularly in the era of RISE with SAP, where traditional customization approaches are giving way to new paradigms of solution building. Drawing from extensive experience in enterprise SAP implementations, we have witnessed firsthand the journey from traditional ABAP development to today's cloud-based, full-stack solutions. The emergence of SAP Build, combined with generative AI capabilities and the SAP **Business Technology Platform** (**BTP**), has created unprecedented possibilities for innovation, while simultaneously introducing new complexities in architecture, security, and deployment.

A central theme of this transformation is the strategic integration between SAP and hyperscaler environments like AWS. Throughout this book, we present practical use cases demonstrating how this powerful combination enables organizations to leverage both SAP's business process expertise and the advanced cloud services of hyperscalers. From data federation and machine learning to serverless architectures and edge computing, we explore how these integration patterns solve real business challenges while maintaining security and governance.

This book bridges the critical gap between traditional SAP development and modern cloud-based approaches. We have structured it to provide both theoretical understanding and practical guidance, ensuring you can confidently navigate SAP's new builder space while maintaining the resilience and reliability your enterprise demands. Each chapter includes concrete use cases drawn from real-world implementations, helping you translate concepts into actionable solutions for your specific business needs.

Whether you are an ABAP developer transitioning to cloud solutions, an integration architect exploring new possibilities, or a DevSecOps specialist seeking to optimize SAP implementations, you will find actionable insights for building and maintaining robust SAP environments. We pay particular attention to the guardrails and best practices necessary for success in this new landscape, while never losing sight of the ultimate goal: delivering business value through well-architected solutions.

As SAP continues its cloud transformation journey, understanding how to leverage these new tools and platforms becomes not just advantageous but essential. This book is your roadmap to mastering this evolving ecosystem, ensuring your SAP enterprise remains resilient, adaptable, and future-ready.

Welcome to the next generation of SAP solution building.

Chapter 1: Introduction to the Modern SAP Enterprise – This foundational chapter sets the stage for modern SAP development, introducing the critical concept of clean core methodology and its impact on business operations. Readers will discover how the evolution from traditional development to API-based applications fundamentally changes the SAP landscape. The chapter explains why maintaining a clean core reduces operational costs and simplifies upgrades while optimizing performance. It addresses the urgent need for ABAP developers and architects to modernize their skill sets, providing a clear pathway to understanding modern SAP development practices alongside the latest available tools and training resources.

Chapter 2: Overview of SAP's Latest Offers, RISE and GROW – A comprehensive exploration of SAP's transformation from perpetual licensing to subscription-based models through RISE and GROW with SAP. The chapter examines how this strategic shift impacts development methodologies, tools, and approaches. Readers will gain clear insights into the differences between traditional S/4HANA development environments and new cloud-based platforms. Special attention is given to the changing landscape of development capabilities,

including both new opportunities and limitations in code deployment, configuration management, and change control processes.

Chapter 3: SAP Business Technology Platform and Cloud Provider Integration– An in-depth examination of SAP **Business Technology Platform** (**BTP**) and its strategic integration with hyperscaler environments. The chapter explores how this powerful combination enables organizations to build scalable, resilient applications while leveraging cloud-native services. Readers will understand the core components of SAP BTP, key integration patterns with hyperscalers like AWS, and practical implementation approaches. The discussion includes real-world examples demonstrating how data federation, API management, and machine learning capabilities create new opportunities for digital transformation and innovation in SAP landscapes.

Chapter 4: Introduction to Generative AI – An exploration of how generative AI is revolutionizing the SAP ecosystem, providing unprecedented capabilities for content creation, process automation, and decision support. The chapter presents SAP's comprehensive approach to business AI, examining the Generative AI Hub and integration patterns with foundation models. Readers will gain practical insights into implementing generative AI solutions within their SAP landscape, understanding key concepts like prompt engineering, RAG, and embeddings. Special focus is given to enterprise use cases and how organizations can balance innovation with security and governance requirements.

Chapter 5: Building Well-Architected Applications on SAP BTP– A detailed guide to applying well-architected principles when developing applications on SAP BTP. The chapter examines the five foundational pillars: operational excellence, security, reliability, performance efficiency, and cost optimization. Readers will learn practical methodologies for evaluating and implementing architectural decisions that maintain resilience while enabling innovation. The discussion includes architectural patterns, implementation strategies, and measurement frameworks that help organizations build SAP applications that are both technically sound and aligned with business objectives.

Chapter 6: Managing Application Security and Costs – A comprehensive examination of security frameworks and cost optimization strategies for SAP cloud deployments. The chapter details the shared responsibility model and its implications for enterprise applications. Readers will understand how to implement effective security controls across their SAP landscape while maintaining operational efficiency. Special attention is given to RISE with SAP security considerations, connectivity options, and practical approaches to cost management. The chapter provides actionable guidance for balancing security requirements with budget constraints in today's complex threat landscape

Chapter 7: Concluding Remarks and Addition Resources– The final chapter synthesizes the book's key concepts into actionable insights for building resilient SAP architectures. It provides a strategic framework for establishing and scaling SAP build environments, with particular attention to future-proofing investments. The chapter serves as both a summary and a roadmap, helping readers plan their next steps in modernizing their SAP development practices.

Coloured Images

Please follow the link to download the
Coloured Images of the book:

https://rebrand.ly/09kfxml

We have code bundles from our rich catalogue of books and videos available at **https://github.com/bpbpublications**. Check them out!

Errata

We take immense pride in our work at BPB Publications and follow best practices to ensure the accuracy of our content to provide with an indulging reading experience to our subscribers. Our readers are our mirrors, and we use their inputs to reflect and improve upon human errors, if any, that may have occurred during the publishing processes involved. To let us maintain the quality and help us reach out to any readers who might be having difficulties due to any unforeseen errors, please write to us at :

errata@bpbonline.com

Your support, suggestions and feedbacks are highly appreciated by the BPB Publications' Family.

Piracy

If you come across any illegal copies of our works in any form on the internet, we would be grateful if you would provide us with the location address or website name. Please contact us at **business@bpbonline.com** with a link to the material.

If you are interested in becoming an author

If there is a topic that you have expertise in, and you are interested in either writing or contributing to a book, please visit **www.bpbonline.com**. We have worked with thousands of developers and tech professionals, just like you, to help them share their insights with the global tech community. You can make a general application, apply for a specific hot topic that we are recruiting an author for, or submit your own idea.

Reviews

Please leave a review. Once you have read and used this book, why not leave a review on the site that you purchased it from? Potential readers can then see and use your unbiased opinion to make purchase decisions. We at BPB can understand what you think about our products, and our authors can see your feedback on their book. Thank you!

For more information about BPB, please visit **www.bpbonline.com**.

Table of Contents

Chapter 1
Introduction to the Modern SAP Enterprise

Introduction

SAP customers often leverage code customizations as part of their enterprise transformation journey to tailor SAP solutions to fulfill their business needs. These customizations involve modifying, extending, or creating the business functionality of SAP applications by developing custom code. This is essential to aligning SAP software with unique business processes, industry requirements, or specific organization needs based on a customer's geography or global footprint. Development is not just about writing code.

A modern approach to the SAP enterprise involves keeping the core clean and building loosely coupled API-based applications that integrate with the customer's core **enterprise resource planning** (**ERP**) systems. There is often more than one system to integrate with. This approach reduces the operational burden of maintaining many ERP systems, efficiently upgrading and patching systems, optimizing performance, and pinpointing trouble before it begins in the enterprise.

SAP is the leading provider of ERP software since being founded in 1972. Over the course of five decades, SAP has evolved from providing systems and frameworks of packaged applications to industry-leading

software and solutions, offered as a managed service, with a suite of products that enable customers to integrate with their internal has been the leading provider of ERP software since it was and develop new applications leveraging the latest cloud services the market has to offer.

We wrote this book to provide the reader with an overview of SAP's shift in delivering its flagship ERP software, the sizing and license requirements that customers should consider, the journey to either upgrading or initiating their ERP business transformation, leveraging native cloud services provided by cloud providers, and harnessing the power of GenAI in their ERP applications.

Structure

The topics covered in the chapter are as follows:

- Introducing SAP clean core methodology
- Evolution of the SAP development platform
- Introduction to SAP Cloud Platform extension tools

Objectives

By the end of this chapter, you will gain a comprehensive understanding of SAP's latest solutions and methodologies as of this book's writing. For those beginning their SAP journey, this chapter serves as an essential foundation, introducing key concepts and current best practices. You will learn critical SAP terminology, explore the platform's core solutions, understand SAP's emerging generative AI strategy, and discover the essential tools that will help you succeed in your SAP projects.

Introducing SAP clean core methodology

Many organizations have been using SAP for decades, and their systems have evolved over time. Here's an overview of the typical state of SAP systems in many enterprises.

SAP custom code and configuration

For decades, customers have been customizing the ERP core to accommodate their implementation to their business needs and business processes. Writing custom code to enhance and modify the standard functionality has been the usual course of action for almost all enterprises. The primary development language for SAP systems is SAP's **Advanced Business Application Programming (ABAP)**. Maintaining custom code not only involves boundary systems and resources, but it also requires dependency validations and configurations during major and minor releases, the utilization of SAP transport management, and a thorough understanding of SAP's business process design and development. It also involves ongoing activities to ensure that custom code remains functional, efficient, and compatible with system upgrades and changes.

Challenges with managing custom code

Managing custom code in SAP is a crucial aspect of ensuring system stability, security, and ease of maintenance. Effective management practices help SAP customers keep track of their custom developments, adapt to changing business requirements, and seamlessly integrate with future SAP updates. Here are common strategies SAP customers employ to manage their custom code:

- **System upgrades and S/4HANA conversion**: Managing custom code during system upgrades requires careful attention, particularly when transitioning to S/4HANA. Each new SAP software release necessitates a comprehensive impact analysis of existing custom code. This analysis identifies required modifications to maintain system compatibility, from adjusting code logic to adapting new data structures and replacing deprecated functionalities. The SAP ECC to S/4HANA transformation presents particular challenges. Organizations typically undertake extensive custom code analysis projects spanning multiple months to ensure successful adoption. While SAP provides tools like **Custom Code Migration and Analysis** (**CDMC**) to support this process, the scope of work remains substantial. Many organizations leverage specialized tools and frameworks developed by SAP partners to streamline their transformation journey.

- **SAP patching and support pack update**: SAP patching and support package updates are important for customers to remediate security vulnerabilities, known bugs, and performance issues. Custom code adds an extra burden of unit testing and integration testing of business scenarios during and after the support package is applied to SAP systems. It is important to test custom code after applying these updates to ensure a successful business outcome.
- **Ever-growing custom code**: Over the period of time, custom code becomes stale and unused in the system. There are many customers who do not retire their custom code even if the business process does not use it anymore. This is one of the biggest factors for maintaining the custom code in the long run. There is no governance around the custom code retirement and verification process. Old custom code can lead to hindrance in performance and increase operational issues.
- **Testing and quality assurance**: As part of maintenance activities, thoroughly test custom code changes to ensure they function correctly and do not introduce any new issues. This includes regression testing, integration testing, and performance testing. Maintaining a comprehensive test suite helps validate the stability and reliability of the custom code.
- **Performance monitoring and optimization**: Leveraging SAP tools to continuously monitor code performance, capturing and analyzing code execution in order to identify performance remediation, and data access pattern performance.
- **Version control systems:** SAP customers often use **version control systems** (**VCS**), such as Git or SAP's own Transport Organizer, to manage changes to custom code. This enables tracking of code versions, collaborative development, and the ability to roll back changes if needed.
- **Transport management system (TMS):** TMS is a key tool in SAP for managing the transport of custom code between different system landscapes, such as development, testing, and production environments. TMS ensures that changes are properly transported and synchronized across systems.
- **Code documentation:** Comprehensive documentation is vital for maintaining and evolving custom code over time. SAP customers implement a multi-layered documentation strategy, combining code comments, inline documentation,