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**SAP® Enterprise Support**

ASAP to Run SAP
Contents at a Glance

1 Introduction .......................................................... 17

2 Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise ............................................ 35

3 Introducing the Measurement Platform ................................. 89

4 Customer Center of Expertise ....................................... 99

5 Preserving Business Continuity .................................. 131

6 Accelerated Innovation .............................................. 163

7 Improving Business Processes ...................................... 197

8 Protection of the IT Investment .................................. 219

9 Innovating Without Risking Disruptions .......................... 257

10 SAP MaxAttention and SAP Safeguarding ....................... 271

11 Mission-Critical Support for Partner Applications and Technologies ................................................................. 289

12 Run SAP Programs for SAP Partners ............................ 311

13 Overview of Training and Certification Offerings ............. 323
Contents

Preface .......................................................................................................................... 15

1 Introduction ............................................................................................................. 17
   1.1 What SAP Enterprise Support Can Do for You ............................................. 18
   1.2 SAP Standards for Solution Operations ..................................................... 20
   1.3 Creating the Foundation for a Single Source of Truth .............................. 23
   1.4 About This Book ........................................................................................... 30

2 Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise .......................... 35
   2.1 Basic Concepts .............................................................................................. 35
      2.1.1 Application Management Lifecycle .................................................... 36
      2.1.2 Projects in SAP Solution Manager ...................................................... 37
      2.1.3 Solutions in SAP Solution Manager .................................................... 38
      2.1.4 Processes for Application Lifecycle Management .................................. 40
      2.1.5 Quality Gates in SAP Solution Manager ............................................. 44
   2.2 Implementing SAP Solution Manager as a Standardized Platform for Application Lifecycle Management ............................................................ 45
      2.2.1 Planning ................................................................................................. 46
      2.2.2 Installation and Configuration of SAP Solution Manager ..................... 46
   2.3 Business Configuration .................................................................................... 49
      2.3.1 Requirements Phase ............................................................................. 50
      2.3.2 Design Phase ......................................................................................... 52
      2.3.3 Build and Test Phase ............................................................................ 54
      2.3.4 Deploy Phase ......................................................................................... 60
   2.4 Business Continuity ......................................................................................... 63
      2.4.1 Operate Phase ....................................................................................... 63
      2.4.2 Optimize Phase ...................................................................................... 78
3 Introducing the Measurement Platform .......................... 89

3.1 SAP Solution Manager as SAP’s Measurement Platform ... 90
3.2 Architecture and Definition of the Measurement Platform ................................................ 91
3.3 Continuous Assessment and Improvement ...................... 94
3.4 Outlook on Upcoming Enhancements to the Measurement Platform ........................................ 96

4 Customer Center of Expertise ........................................ 99

4.1 Challenges for the CIO ................................................. 101
4.1.1 Ensure Business Continuity ..................................... 102
4.1.2 Reduce Costs ...................................................... 104
4.1.3 Improving Business Processes ............................... 105
4.1.4 Accelerate Innovation ........................................ 105
4.2 Organizational Model for Company Solution Operations ......................................................... 106
4.2.1 Optimizing Internal Collaboration in Two Ways ... 109
4.2.2 Outtasking and Outsourcing ............................... 109
4.3 From Customer Competence Center to Customer Center of Expertise ..................................... 110
4.3.1 The Customer COE Charter .................................... 111
4.3.2 The Reactive IT Box ............................................ 113
4.3.3 Set up, Manage, and Coordinate the Situation Room .................................................. 114
4.3.4 Quality Manager Roles in the Customer COE ...... 117
4.3.5 Customer COE Certification ................................ 127

5 Preserving Business Continuity ..................................... 131

5.1 Highest Availability of Mission-Critical Business Processes ......................................................... 132
5.2 The Necessity of Business Continuity ......................... 134
5.2.1 Ensuring Continuous Business Availability .......... 134
5.2.2 Operate More Systems with Fewer Resources .... 134
5.2.3 Reduce License and Project Costs with SAP Solution Manager Enterprise Edition .......... 135
5.2.4 Reduce Cost of Resources ................................. 136
## 5.2.5 Reduce Infrastructure Requirements

Reduction of infrastructure requirements can lead to cost savings and improved efficiency. This section discusses strategies for minimizing the need for extensive hardware and software resources. The focus is on identifying areas where technology can be optimized to support business needs effectively.

## 5.2.6 Increase Business Value of IT

Increased business value is achieved through the strategic integration of IT with business processes. This section outlines methodologies for aligning IT initiatives with corporate goals, ensuring that IT investments yield tangible results.

## 5.3 Managing Business Continuity from the QM's Perspective

Managing business continuity is crucial for maintaining operations during disruptions. This section delves into the role of the Quality Manager (QM) in ensuring consistent service provision. It covers close cooperation between QM and teams, as well as specific strategies for SAP technical operations and business process operations.

## 5.3.1 Close Cooperation Between QM and Teams

Effective collaboration between the QM and teams is essential for a seamless business continuity strategy. This section highlights the importance of open communication and shared responsibilities in maintaining business operations.

## 5.3.2 SAP Technical Operations

SAP technical operations play a vital role in the smooth functioning of business processes. This section explores strategies for optimizing SAP operations to enhance business continuity.

## 5.3.3 Business Process Operations

Business process operations are critical for maintaining the efficiency of day-to-day operations. This section provides insights into improving business process operations to ensure minimal disruption in the event of a crisis.

## 5.3.4 Application Management Team

The application management team is responsible for the maintenance and support of applications used in business processes. This section discusses the strategies for managing applications effectively to support business continuity.

## 5.4 Quality Management for Business Continuity: How You Can Measure Your Success

Measuring success in business continuity is essential for gauging the effectiveness of strategies implemented. This section offers guidance on how to evaluate the performance of business continuity efforts and identify areas for improvement.

## 5.4.1 Technical Operations

Technical operations are a cornerstone of business continuity planning. This section provides metrics and indicators for assessing the performance of technical operations.

## 5.4.2 Business Process Operations

Business process operations must be regularly evaluated to ensure they align with business objectives. This section details the methods for monitoring and measuring the performance of business process operations.

## 5.4.3 Application Management

Application management effectiveness is crucial for maintaining business operations. This section outlines techniques for assessing the quality of application management.

## 5.5 Services Available from SAP Active Global Support, Training, and Certification

SAP offers a range of services to support business continuity. This section introduces the services available from SAP, including global support, training, and certification programs.

## 5.6 Case Study: Ensuring Stable Operations

A case study demonstrates real-world application of business continuity strategies. This section presents a scenario where stable operations are ensured through effective business continuity planning.

## 5.6.1 The Case-Study Scenario

A detailed description of the case study scenario is provided, highlighting the challenges faced and the strategies implemented to ensure operational stability.

## 5.6.2 Setting Up Standard-Compliant Operations

Standard-compliant operations are essential for maintaining consistency and reliability. This section offers guidance on setting up operations that meet industry standards.

## 5.6.3 Application Management and SAP Technical Operations Strategy

A well-defined strategy is key to successful application management and technical operations. This section outlines the steps involved in creating a strategic plan for these operations.

## 5.6.4 Business Process Operations Strategy

Effective business process strategies are necessary for maintaining the flow of operations. This section provides insights into creating strategies that support business continuity.

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## 6 Accelerated Innovation

Innovation is crucial for staying ahead in today's fast-paced business environment. This section explores strategies for accelerating innovation, focusing on integration testing and technical integration validation.

## 6.1 Integration Testing

Integration testing is a critical component of ensuring that systems work together seamlessly. This section covers the best practices for integration testing, including test strategy formulation, project preparation, scope identification, and change management.

## 6.1.1 Test Strategy

A clear test strategy is fundamental for successful integration testing. This section outlines the key elements of a test strategy, including test objectives, test cases, and expected outcomes.

## 6.1.2 Test Project Preparation

Preparing for a test project is crucial for its success. This section provides guidance on project planning, including resource allocation, timeline development, and risk management.

## 6.1.3 Test Scope Identification

Identifying the test scope is essential for focusing resources on the most critical areas. This section discusses methods for determining test scope and prioritizing test cases.

## 6.1.4 Business Process Change Analyzer and EHP Business Functions

Analyzing business process changes and understanding EHP business functions are key to successful integration. This section offers strategies for conducting change analysis and assessing the impact of EHP functions.

## 6.1.5 Test Planning and Test-System Preparation

Test planning and system preparation are vital for the successful execution of integration tests. This section provides guidance on planning test strategies and preparing test systems for integration.

## 6.1.6 Test Execution

Actual execution of integration tests requires careful planning and execution. This section outlines the steps involved in test execution, including test execution scripts, test data management, and test environment setup.

## 6.1.7 Final Activities and Deployment of Changes in Production Systems

Deploying changes in production systems requires careful planning and execution. This section discusses the final activities involved in deploying changes and maintaining operational stability.

## 6.2 Technical Integration Validation

Validating technical integration is crucial for ensuring that systems are ready for deployment. This section covers the methodologies for technical integration validation, including method selection, assessment execution, and optimization strategies.

## 6.2.1 Method

Selecting the appropriate validation method is essential for achieving successful integration. This section provides guidance on choosing the right method for technical integration validation.

## 6.2.2 Assessment

Conducting a thorough assessment is critical for identifying integration issues. This section outlines the steps involved in performing technical integration assessments, including data collection, analysis, and reporting.

## 6.2.3 Technical Analysis

Analyzing technical data is necessary for understanding integration performance. This section provides guidance on conducting technical analysis and interpreting results.

## 6.2.4 Optimization

Optimizing technical integration is crucial for maximizing the benefits of integration. This section offers strategies for improving integration performance and reducing integration risks.
## Contents

6.2.5 Verification .......................................................... 178

6.2.6 Case Study: Added Value from Integration Validation ............................................................ 179

6.3 Services Available from SAP Active Global Support .......................................................... 182

6.4 Case Study ...................................................................... 183

6.4.1 Step 1: Identify the Situation Prior to Integration Testing ............................................. 184

6.4.2 Step 2: Understand the Solution Using Minimum Documentation .................................. 184

6.4.3 Step 3: Integration Test and Detection of Issues ............................................................. 189

6.4.4 Step 4: Identify Root Causes .................................................. 189

6.4.5 Step 5: Recommendations to Resolve Issues ......................................................... 190

6.4.6 Step 6: Implement the Recommendations ............... 194

6.4.7 Step 7: Verification and Validation of Successful Integration ......................................................... 195

7 Improving Business Processes ........................................... 197

7.1 Roles and Objectives of the QM ..................................... 198

7.2 Methodology and Tools .................................................. 199

7.2.1 Determining the Business Process Requirements ........................................................................ 201

7.2.2 Appraisal of the Solution Landscape ....................... 202

7.2.3 Checking the Technical Implementation of Business Processes .................................................. 203

7.2.4 Recording Process-Related Problems and Possible Optimization Potential .................. 204

7.2.5 Analyzing Interfaces ................................................... 205

7.2.6 Summarizing the Results ........................................... 206

7.2.7 Follow-Up Activities After an SAP Solution Management Assessment ................................... 206

7.3 Prerequisites for Business Process Improvements ......................................................... 207

7.4 Business Process Monitoring .......................................... 208

7.5 Related Services Available from SAP Active Global Support ......................................................... 209

7.6 Success Factors ............................................................... 210
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.7 Skills and Training</td>
<td>212</td>
</tr>
<tr>
<td>7.8 Case Study: Improving the Order-to-Cash Business Process</td>
<td>213</td>
</tr>
<tr>
<td><strong>8 Protection of the IT Investment</strong></td>
<td>219</td>
</tr>
<tr>
<td>8.1 Extended Maintenance in the Context of SAP Enterprise Support</td>
<td>221</td>
</tr>
<tr>
<td>8.1.1 Special Rules for the Extended Maintenance for Customers with SAP Enterprise Support</td>
<td>223</td>
</tr>
<tr>
<td>8.1.2 Benefits and Advantages of Extended Maintenance</td>
<td>225</td>
</tr>
<tr>
<td>8.2 Quality Management</td>
<td>225</td>
</tr>
<tr>
<td>8.3 Harmonized IT Landscape</td>
<td>229</td>
</tr>
<tr>
<td>8.3.1 Keep the Software Landscape Up to Date</td>
<td>229</td>
</tr>
<tr>
<td>8.3.2 Document and Minimize Custom Code</td>
<td>231</td>
</tr>
<tr>
<td>8.3.3 Evaluation of Custom Developments</td>
<td>232</td>
</tr>
<tr>
<td>8.3.4 Keep the Master Release Plan Up to Date</td>
<td>237</td>
</tr>
<tr>
<td>8.4 Methodology and Tools</td>
<td>238</td>
</tr>
<tr>
<td>8.4.1 SAP Solution Manager Maintenance Optimizer</td>
<td>239</td>
</tr>
<tr>
<td>8.4.2 SAP Solution Manager Methodology and Tools Ease Upgrades</td>
<td>239</td>
</tr>
<tr>
<td>8.4.3 Solution Documentation Assistant</td>
<td>240</td>
</tr>
<tr>
<td>8.4.4 Custom-Development Management Cockpit</td>
<td>241</td>
</tr>
<tr>
<td>8.4.5 Upgrade Dependency Analyzer</td>
<td>242</td>
</tr>
<tr>
<td>8.4.6 SAP Standard for Solution Documentation for Custom Development</td>
<td>243</td>
</tr>
<tr>
<td>8.4.7 SAP Standard for Custom Code Management</td>
<td>244</td>
</tr>
<tr>
<td>8.4.8 SAP Standard for Incident Management</td>
<td>245</td>
</tr>
<tr>
<td>8.4.9 SAP Standards for Change Management</td>
<td>246</td>
</tr>
<tr>
<td>8.4.10 Report Issued by SAP Enterprise Support</td>
<td>246</td>
</tr>
<tr>
<td>8.5 Related Services Available from SAP Active Global Support</td>
<td>247</td>
</tr>
<tr>
<td>8.5.1 SAP Solution Transition Assessment</td>
<td>247</td>
</tr>
<tr>
<td>8.5.2 Modification Justification Check</td>
<td>248</td>
</tr>
<tr>
<td>8.5.3 Custom Code Maintainability Check</td>
<td>249</td>
</tr>
<tr>
<td>8.5.4 Accelerated Innovation Enablement</td>
<td>250</td>
</tr>
</tbody>
</table>
## Contents

8.5.5 SAP Business Process Performance Optimization ........................................ 251
8.5.6 SAP Upgrade Assessment ................................................................. 251
8.5.7 SAP Downtime Assessment ................................................................. 252
8.5.8 Continuous Quality Checks ................................................................. 252
8.6 Success Factors and Related Standards .................................................... 253
8.7 Skills and Training ................................................................................. 254
8.8 Case Study: Planning Requests for Innovation ........................................... 254

### 9 Innovating Without Risking Disruptions ............................................ 257

9.1 Service-Oriented Architecture: The Evolutionary Approach .............................. 258
9.2 The Maintenance Strategy: Stable Core and Access to Innovations ...................... 259
9.3 SAP Enhancement Packages ....................................................................... 260
9.3.1 Selective Use of New Functions .......................................................... 262
9.3.2 Separation of Maintenance and Further Development ............................... 263
9.3.3 Available Innovations Information Sources ............................................ 264
9.4 Tools for Deploying SAP Enhancement Packages ........................................... 265
9.4.1 Maintenance Optimizer for Enhancement Packages .................................. 265
9.4.2 SAP Enhancement Package Installer ..................................................... 265
9.4.3 Near-Zero Downtime ........................................................................... 267
9.5 Switch Framework and Activation ................................................................ 268
9.6 Case Study: Experiences of SAP’s IT Department ........................................... 269

### 10 SAP MaxAttention and SAP Safeguarding ........................................ 271

10.1 The Holistic Approach of SAP MaxAttention ............................................. 273
10.2 The Engagement and Governance Model .................................................... 276
10.3 A Standardized Approach ......................................................................... 277
10.4 Safeguarding for Implementations, Upgrades, Migrations, and Operations ............. 282
10.5 Continuous Improvement Through SAP MaxAttention .................................. 283
10.6 Optimizing Architecture and System Landscape ......................................... 284
10.6.1 Architecture Services ................................................................. 285
10.6.2 Support Services for System Landscape Optimization ............................ 286
10.7 High Security Standards .......................................................... 287
10.8 Sustainability Aspect ........................................................... 287

11 Mission-Critical Support for Partner Applications and Technologies ......................................................... 289

11.1 Support Processes with Partners ........................................... 291
  11.1.1 The Problem-Solving Process in Detail ......................... 292
  11.1.2 Remote Connections to Customer Systems .................... 293
  11.1.3 Note Creation for Partners ......................................... 294
  11.1.4 Integration with the SAP Global Support Backbone ............... 294
  11.1.5 Service Level Agreement ........................................ 295
11.2 Support for Partner Solutions by Software Partners ................. 296
11.3 The Value of Partner Integration for SAP Customers ............... 299
11.4 Integrating Value Added Resellers into the SAP Ecosystem ............ 301
  11.4.1 Incorporating VARs into the Support Delivery Model .............. 302
  11.4.2 Elements of SAP Enterprise Support from the VAR Perspective .............. 304
  11.4.3 Establishing an SAP Enterprise Support- Capable Support Organization .......... 308

12 Run SAP Programs for SAP Partners ...................................... 311

12.1 The Run SAP Methodology .................................................... 311
12.2 The Run SAP Implementation Partner Program for SAP Service Partners .................................................. 315
12.3 The SAP Support Partner Program ........................................ 318
12.4 The SAP Training and Certification Program for Running End-to-End Solutions .................................. 320

13 Overview of Training and Certification Offerings ............... 323

13.1 Training Classes ................................................................. 324
13.2 Certification ................................................................. 326
Contents

Appendices ................................................................. 327
A Additional Information and Offerings ......................... 329
A.1 Expert Guided Implementation ................................. 329
A.1.1 Basic Training Offering ...................................... 330
A.1.2 Target Group and General Requirements ............... 331
A.1.3 Delivery ......................................................... 332
A.2 Continuous Quality Checks ...................................... 335
A.2.1 Continuous Quality Check for SAP Solution Manager ......................................................... 335
A.2.2 Continuous Quality Checks for Implementation ... 336
A.2.3 Continuous Quality Checks for Operations .......... 336
A.2.4 Continuous Quality Checks for Upgrade Projects ......................................................... 338
A.3 Services from SAP Active Global Support ................. 340
A.3.1 SAP Business Process Management .................... 340
A.3.2 Data Volume Management .................................. 340
A.3.3 SAP EarlyWatch Alert ....................................... 340
A.3.4 Preparation Session for SAP Solution Manager ... 341
A.3.5 SAP GoingLive Check ....................................... 341
A.3.6 Optimization Sessions ...................................... 342
A.3.7 SAP Technical Integration Check ........................ 343
A.3.8 SAP Business Process Performance Optimization ......................................................... 344
A.3.9 SAP Interface Management ................................ 345
A.3.10 SAP Solution Management Assessment ............. 345
A.3.11 Modification Justification Check ......................... 346
A.3.12 Solution Architect Services ............................... 347
A.3.13 Other Services from SAP AGS ............................ 347
A.4 SAP Product Standards ........................................... 348
A.4.1 SAP Product Standard: Business Configuration ... 348
A.4.2 SAP Product Standard: IT Service and Application Management ......................................................... 352
B Bibliography .............................................................. 359
C Editors .............................................................................. 361
D Authors and Editorial Office .............................................. 363
D.1 Editorial Office ......................................................... 363
D.2 Authors ................................................................. 363
Index .............................................................................. 367
With its holistic approach to application lifecycle management (ALM), SAP Enterprise Support services enable you to drive innovation faster, improve business continuity, and, at the same time, reduce both risk and total cost of operations.

1 Introduction

Management of an SAP solution requires comprehensive and up-to-date knowledge of the solution. SAP calls this knowledge, contained in one system, a single source of truth. It is a structured, comprehensive, and reliable collection of information about the state of all of your current projects and productive SAP-based processes that serves as the foundation of well-grounded and fact-based decisions and actions along the entire application lifecycle.

SAP Enterprise Support is a holistic offering that supports your business processes comprehensively, thus protecting your IT investment and sustaining your IT solution throughout the entire application lifecycle. The mission statement ASAP to Run SAP reflects this claim: All of the phases of the application lifecycle are covered, allowing you to quickly implement and deploy business processes into productive use, to support their long-term operation, and to flexibly adapt and continuously optimize them from the implementation methodology to the end-to-end solution operations. In this context, SAP Enterprise Support covers not only SAP applications and technology but also the complete platform, including complementary partner software and customer-specific solutions.

By combining the components outlined in Figure 1.1, SAP Enterprise Support facilitates managing highly integrated IT solutions and value networks with an end-to-end quality-assurance process.
1.1 What SAP Enterprise Support Can Do for You

Value proposition

SAP Enterprise Support enables accelerated innovation by making continuous improvements and masking complexity. Emphasis is placed on protecting investments. With this offering, SAP aims to support you in reducing your total cost of ownership (TCO) and risks in relation to the operation of SAP-centric solutions. The fact that SAP Enterprise Support can reduce TCO has clearly been shown by the results of the SAP User Group Executive Network (SUGEN) Key Performance Indicator (KPI) program, which was conducted in 2009 and continues in 2010, in the framework of the SAP Enterprise Support advisory customer program. Details on the underlying measurement platform are described in Chapter 3, Introducing the Measurement Platform.

The holistic value of SAP Enterprise Support is not a theory or a marketing campaign; it is a reality that can easily be verified by the customer proof points that have been collected by SAP Active Global Support (SAP AGS) in the Customer Quotes Program. The quotes highlight the quantifi-
What SAP Enterprise Support Can Do for You

1.1

able value created by SAP support engagements. SAP customers have submitted more than 1,000 quotes for external publication on the SAP Service Marketplace to share with their peers. These quotes, describing the value of SAP Enterprise Support during all phases of the application lifecycle, can be found at http://service.sap.com/customerquotes. These quotes clearly show the confidence and trust inspired by SAP Enterprise Support in SAP’s customer base.

SAP Enterprise Support achieves these objectives by applying SAP standards for solution operations to tasks such as monitoring business processes, managing custom developments, ensuring remote supportability, and using sophisticated diagnostic functions (see Section 1.2, SAP Standards for Solution Operations). Each of the standards provides best practices for individual tasks, recommendations for using the various capabilities and processes in SAP Solution Manager, and information on training courses and services that help you implement the standards to unlock SAP Enterprise Support’s full potential.

Implementing these standardized processes in the context of SAP Enterprise Support is leveraged by Run SAP, which is the implementation methodology for end-to-end solution operations. The Run SAP methodology (see Section 12.1, The Run SAP Methodology) contains standards for end-to-end solution operations based on SAP Solution Manager. These standards cover the demands of both business process experts and IT specialists. The methodology was developed jointly by SAP Consulting and SAP Active Global Support.

Another component for implementing SAP Enterprise Support handles the task of supporting mission-critical processes. This offering provides continuous quality checks (CQCs), explicit service-level agreements (SLAs), clearly defined contact persons (support advisory center), and root cause analyses — including custom development — on a 24/7 basis. The SAP Enterprise Support report is also a valuable instrument for planning future investments because it gives a clear overview on achievements and areas with improvement potential.

The task of supporting mission-critical processes requires — among other things — rapid support, remote diagnostics, advice, and knowledge transfer from experienced SAP experts as well as services to ensure
Introduction

continuous optimization and quality assurance. All of this is organized using the functions for collaboration in SAP Solution Manager.

The SAP global support backbone is made up of SAP Solution Manager, enterprise edition; SAP Service Marketplace; and the SAP service and support backbone infrastructure. It constitutes the technical foundation of SAP Enterprise Support. The 24-hour availability of SAP partners that are integrated into the SAP global support backbone enables you to obtain fast solutions from SAP or its partners for all problem messages through a single point of contact.

1.2 SAP Standards for Solution Operations

A key prerequisite for a single source of truth is the clear definition of processes, responsibilities, service-level agreements (SLAs), and key performance indicators (KPIs) to measure the fulfillment of service levels. SAP has defined standards and best practices that help customers set up and run end-to-end solution operations for their SAP-centric solutions. These cover not only applications from SAP or resold by SAP (vendor-branded reselling products, VBRs) but also applications from independent software vendors (ISVs), original equipment manufacturers (OEMs), and custom-code applications integrated into customers’ solution landscapes.

The SAP standards complement commonly agreed upon standards such as the IT Infrastructure Library (ITIL). You can reproduce in detail how the processes for lifecycle management can be integrated into your SAP solution. The SAP standards contain the following components:

- **Incident management**
  The process of incident resolution.

- **Exception handling and business process and interface monitoring**
  How to define a model and procedures to manage exceptions and error situations during daily business operations. It also defines the monitoring and supervision of mission-critical business processes.

- **Data integrity and transactional consistency**
  Helps avoid data inconsistencies in end-to-end solution landscapes.
and safeguards data synchronization across applications in distributed system landscapes.

- **Change management**
  Enables efficient and timely implementation of changes with minimal risk.

- **Upgrade**
  Guides customers and technology partners through upgrade projects.

- **Root cause analysis**
  Defines how to perform end-to-end root cause analysis across different support levels and different technologies.

- **Custom code management**
  Details how to effectively manage customer-specific development and functional enhancements.

- **Solution documentation and solution documentation for custom development**
  Defines the required level of documentation and the reporting capabilities needed for customer solutions.

- **Security**
  Provides best practices for the secure operation of SAP-centric solutions.

- **Remote supportability**
  Contains five basic requirements that have to be met to optimize the supportability of customer solutions.

- **Data volume management**
  Describes how to manage data growth.

- **Job scheduling management**
  Explains how to manage the planning, scheduling, and monitoring of background jobs.

- **System administration**
  Describes how to administer SAP technology to run a customer solution efficiently.

- **System monitoring**
  Covers monitoring and reporting of the technical status of IT solutions.
Test management

Explains methods for test management, as well as approaches for functional, scenario-specific-, integrative-, and technical testing of SAP-centric solutions.

Each standard contains best-practice procedures for performing the individual tasks, descriptions of which tools should be used, and information regarding the assignment of tasks to roles, available training offerings, and available services that support the adoption of the standard.

Although multiple roles may be involved in a standard process, one role acts as the owner of the standard. Table 1.1 shows how the mapping is handled in this book. However, the assignments may vary depending on an individual customer’s situation.

<table>
<thead>
<tr>
<th>Owner</th>
<th>Key Standards and Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>End user, key user</td>
<td>Incident management</td>
</tr>
<tr>
<td>Business process champion</td>
<td>Exception handling Data integrity</td>
</tr>
<tr>
<td>Application management</td>
<td>Root cause analysis Remote supportability</td>
</tr>
<tr>
<td>Business process operations</td>
<td>Business process and interface monitoring</td>
</tr>
<tr>
<td></td>
<td>Data volume management</td>
</tr>
<tr>
<td></td>
<td>Job scheduling management</td>
</tr>
<tr>
<td>Technical operations</td>
<td>Transactional consistency</td>
</tr>
<tr>
<td>System administration</td>
<td>System administration</td>
</tr>
<tr>
<td>System monitoring</td>
<td>System monitoring</td>
</tr>
</tbody>
</table>

Table 1.1 Matrix of Owners Mapped to Key Standards

Customer Center of Expertise
To mature your IT, migration from the traditional SAP Customer Competence Center (SAP CCC) to the new Customer Center of Expertise (Customer COE) is required, along with establishing four quality managers that can drive improvement in the following areas:
Creating the Foundation for a Single Source of Truth

1.3 Safeguarding integration validation

1.3 Business continuity

1.3 Business process improvement

1.3 Investment protection

Information about the new Customer COE model, as well as detailed documentation of the four quality managers, is available in Chapter 4, Customer Center of Expertise.

Application lifecycle management (ALM) should lead to a radical reduction of TCI (total cost of implementation), TCO (total cost of ownership), and risk for your IT organization. The key elements of lifecycle management are as follows:

- The ASAP methodology (for implementation) and the Run SAP methodology (for operations)
- The concept of a single source of truth as implemented in SAP Solution Manager
- The organizational aspects of Customer COE and the critical quality management roles
- The SAP Enterprise Support services portfolio

The SAP Solution Manager, enterprise edition, under SAP Enterprise Support, is available to customers with an SAP Enterprise Support contract. With SAP Enterprise Support, you can use the SAP Solution Manager for the complete customer solution, which includes SAP software and all horizontal and vertical IT assets and software components that

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1 The functions and processes of SAP Solution Manager described in this book always refer to the SAP Solution Manager, enterprise edition, under SAP Enterprise Support, unless explicitly stated otherwise (SAP Solution Manager, enterprise edition, under SAP Standard Support). Customers who have a Product Support for Large Enterprises (PSLE) contract can also use the SAP Solution Manager, enterprise edition, under SAP Enterprise Support.
are required to complete the customer’s business processes as documented in the solution documentation in SAP Solution Manager.

This important extension of the usage rights of SAP Solution Manager within SAP Enterprise Support can be illustrated by a simple example. A company has a productive business process, which is documented in the solution documentation in SAP Solution Manager, enterprise edition. Within this process, a printer needs to print out a receipt or a paycheck. If the printer does not work properly, the business process cannot be completed. A user can create an incident for this printer, regardless of whether the root cause of the incident is an empty toner or cartridge, a hardware error, an incorrect printer configuration in the SAP system, or a network error. This incident can be processed end to end using SAP Solution Manager application incident management. This emphasizes the holistic understanding of SAP Enterprise Support for the customers’ business processes: Any incident in the customer solution can be raised, analyzed, processed, and solved completely.

SAP Solution Manager, enterprise edition, under SAP Standard Support continues to allow customers to adopt SAP technologies and innovation, technology updates, and legal changes, and it provides the platform for reactive support capabilities and proactive remote services, for example, SAP GoingLive Check and SAP EarlyWatch Check. SAP Solution Manager, enterprise edition, under SAP Standard Support, provides capabilities to enable the value realization of SAP Standard Support. In a nutshell, this means the following:

- **SAP Solution Manager, enterprise edition, under SAP Standard Support**, enables the adoption of SAP innovation supporting the installation, maintenance, and upgrade within SAP Solution Manager.
- The platform supports the adoption of SAP technologies with maintenance management for corrective software updates (SAP support packages, SAP enhancement packages, and SAP legal change packages).
- Reactive support offerings such as the service desk for SAP software components, SAP NetWeaver-based System Monitoring (e.g., CCMS), and root cause analysis tools for SAP technology continue to be available.
- The proactive remote services SAP EarlyWatch Check and SAP GoingLive Check are also part of SAP Standard Support.
Customers with an SAP Standard Support engagement may use SAP Solution Manager, enterprise edition, only for SAP software, that is, not for the previously mentioned vertical and horizontal IT assets and software components. In SAP Standard Support, the usage rights of SAP Solution Manager are restricted to maintenance tasks as well as the installation, upgrade, and break-fix services of SAP applications and technologies, including all tools for remote root cause analysis.

The intent of this book is to explain SAP Enterprise Support from a customer’s point of view rather than from the SAP perspective. Rather than a functional explanation of the individual components of SAP Enterprise Support, this book tries to describe how the support offering can actually be used to enable ALM in your enterprise, allowing you to leave the limitations of SAP Standard Support far behind you. Therefore, Chapters 3 to 13 presume an SAP Enterprise Support engagement without going into the delta between SAP Standard Support and SAP Enterprise Support in detail.

If you are interested in functional scope descriptions, you can visit the SAP Enterprise Support home page at http://service.sap.com/enterprise-support.

By working through this book, you can get started with ALM and explore the value and scope of establishing a single source of truth for SAP solutions within your company (see Figure 1.2).

The step that logically follows is defining a roadmap for a Run SAP implementation. In this step, you should identify your implementation and operations pain points, and map them to procedures and tools suggested by the Run SAP roadmap. This can help you mature your IT. A clear business case with expectations for return on investment should be developed so that you can measure the economic results of your IT maturity improvement. This assessment may, for example, uncover that the current change request management is already optimal in your organization, but using incident management in SAP Solution Manager, enterprise edition, could provide significant value. Such an assessment through the Run SAP methodology is provided by the SAP Consulting organization or by certified SAP partners (see Chapter 12, Run SAP Programs for SAP Partners). Certain aspects of the Run SAP roadmap are
mandatory for collaboration with SAP Consulting and SAP partners. They are explained later in Section 5.2, The Necessity of Business Continuity, in Chapter 5, and in Chapter 12.

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**Establish the Foundation for SAP Application Lifecycle Management**

Explore the value and scope of establishing a single source of truth for SAP solutions

**Define a roadmap for Run SAP implementation**

Identify pain points | Investigate ROI for improving IT maturity

**Optimize IT processes**

Assign quality managers

**Implement SAP Solution Manager, enterprise edition**

Assistant for basic configuration of SAP Solution Manager

**Empower IT organization**

Run SAP | Customer COE | E2E Solution Operations | SAP Solution Manager

---

SAP Solution Manager, enterprise edition, is the foundation of holistic ALM. Each SAP Solution Manager implementation requires a technical foundation (see Figure 1.3). To implement this foundation, you plan your SAP Solution Manager implementation, install or extend it, and perform the basic configuration of SAP Solution Manager, which comprises connecting your system landscape to SAP Solution Manager.

When this foundation is in place, you can already benefit from end-to-end root cause analysis for efficient troubleshooting across technology
stacks, maintenance optimization; and SAP EarlyWatch Alert services, as well as collaboration with SAP Services, for example, in incident management. Also, the technical prerequisites for CQCs and mission-critical support with SLAs are available after the basic configuration. Scenarios such as system administration or system monitoring can be added to the foundation with a minimum of additional configuration.

In addition, you can document your business processes in SAP Solution Manager. Ideally this happens as part of an implementation project, but you can also document your existing processes with the help of the solution documentation assistant. After you have documented your business processes in SAP Solution Manager, you can carry out test management in SAP Solution Manager, for example, by using the new business pro-
cess change analyzer (BPCA), which can calculate test recommendations based on planned transports to production. Finally, you can define your automated business process operations based on the business-process documentation in SAP Solution Manager.

Value of solution documentation

Depending on the kind of documentation you create in SAP Solution Manager, you can benefit from a wide range of use cases for the implementation, operation, and continuous optimization of your software. Figure 1.4 shows the three fundamental types of documentation and the functions they enable.

The technical landscape documentation (Figure 1.4, item 2) is already covered by the basic configuration of SAP Solution Manager at its minimum required level (Figure 1.4, item 1). The documentation comprises the following:

- Technical Landscape Documentation
- Business Process Documentation
- Technical SLA & IT Reporting
- System Administration
- Custom Development Mgt. Cockpit
- System Monitoring
- Run SAP for Technology
- Change Request Management
- Quality Gate Management
- ASAP
- Accelerated Innovation Enablement for SAP Enterprise Support
- Run SAP for Industries
- Test Workbench & Regression Testing
- Upgrade
- Business Process Monitoring
- Template Management
- Service Desk
- Root Cause Analysis
- Selected CQCs*
- Solution Documentation Assistant
- Solution Documentation Assistant
- Custom Code Maintainability Check
- Test Content
- Configuration Content
- SAP Enterprise Support SLA
- Additional CQCs*
The availability of system data of all productive systems in the system landscape directory (SLD)

The availability of one or more solution landscapes that contain the productive systems as logical components

During the basic configuration, you also implement the communication capabilities between the managed systems and SAP Solution Manager, as well as the connection between SAP Solution Manager and the central SAP support system. After these communication channels are established, you can activate the automated data exchange of the most important technical data (system data and SAP EarlyWatch Alert). If you are using non-ABAP programs, you also configure the end-to-end root cause analysis because these functions are indispensable for error analysis.

Additional information on the basic configuration of SAP Solution Manager and the functions it enables are detailed in Section 2.2.2, Installation and Configuration of SAP Solution Manager.

To use incident management for the entire enterprise and thus support your IT team, additional configuration is required to bring your service desk processes and organization into SAP Solution Manager. Basic incident management for SAP software, however, requires only the basic configuration. Incidents (service desk messages) can be sent to SAP AGS after the basic configuration has been completed.

If you document your core business processes (Figure 1.4, item 3) in a business blueprint, you can use this information not only when support is needed but also throughout the entire software lifecycle. This increases the value of internal communication because there is always a relation to core business processes; that is, the relevance of a requirement or problem is always visible. You can reuse the documentation of business processes with the following SAP Solution Manager processes, for example:

- Test management
- Business process monitoring and interface monitoring
- Job scheduling management
- Upgrade and maintenance projects
- Issue and top issue management
The minimum requirements for the documentation of core business processes are a complete list of all process steps, the assignment of individual process steps to the systems on which they are executed, a list of the transactions (or other entry points as URLs or background jobs) that are called via actions, and the interfaces used. You can document additional information about business processes in SAP Solution Manager, but this is not a prerequisite for SAP Enterprise Support.

Change management is less dependent on the business-process documentation than on the projects and system landscape defined in SAP Solution Manager (maintenance projects). You can benefit from clearly documented quality gates (q-gates) with standard check content for each q-gate. In addition, synchronized deployment of updates across transport tracks can be automated with change management.

Documentation of SAP software modifications (item 4 in Figure 1.4) is particularly important:

1. Modifications are not subject to SAP CQCs.
2. They can be lost in an upgrade when implemented improperly.
3. After some time, actual usage is often no longer checked, and modifications cause unnecessary maintenance cost and performance losses as dead coding.

The documentation comprises a short description of the development and its related development objects, for example, programs in the customer name space. Based on this documentation, you can easily control your coding using the custom development management cockpit (CDMC) in SAP Solution Manager. You can initiate the deletion of obsolete files, folders, reports, and jobs on a regular basis. You also can use the SAP services offered with SAP Enterprise Support (modification justification check and custom code maintainability check) and the end-to-end root cause analysis for custom code.

1.4 About This Book

This book describes the steps required to establish a single source of truth and continuously keep it up to date. It defines the standard for
achieving the knowledge base for a solution centered on SAP software throughout the entire lifecycle. The book describes the vital principles and big picture of application lifecycle management and explains how you can benefit from SAP’s experience to do the following:

- Reduce risk and cost.
- Ensure business continuity.
- Accelerate improvements and innovation.

Supporting an SAP solution for the entire lifecycle based on sound and up-to-date knowledge is the starting point for the optimal use of SAP Enterprise Support services. Take the example of a complex problem analysis. A problem can affect various stakeholders: the IT department, business units, possibly outsourcing or out-tasking partners, application and technology partners, as well as SAP. To ensure that all stakeholders can cooperate in an efficient problem-solving process and thus are able to quickly resolve disruptions, they all need to be able to access certain information, such as the customer’s core business processes, the required applications, the latest changes made, and any incidents or problems that were logged and solved in the past. Establishing a single source of truth is not only imperative for effective management of an SAP solution by in-house experts but also for leveraging the SAP expert network and the collective knowledge and experience these experts have gathered during more than 35 years of supporting SAP's customers.

With SAP Enterprise Support, SAP provides a management application that allows customers to store, retrieve, manage, and analyze all information that makes up each customer’s single source of truth. SAP Solution Manager, enterprise edition, provides the knowledge repository to maintain the single source of truth, as well as the functionality to maintain, update, and use this data in all operations during the solution lifecycle.

This book provides an outline and an overview of the standard procedures customers should carry out during the complete solution lifecycle to reap the benefits of SAP Enterprise Support. The main focus is on activities that are required to configure and operate business-driven changes, that is, the implementation or improvement of business pro-
cesses supported by an SAP solution. Its purpose is to establish a business configuration and operation standard that defines how to best proceed from the conception of a business process to its consumption, including its improvement. This standard explicitly includes IT-related aspects, such as the automation of processes and the documentation, testing, and technical monitoring of interfaces for mission-critical business processes.

In Chapter 2, Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise, we introduce the essential concepts of application lifecycle management (ALM) — the definition of the lifecycle itself — and an explanation of the basic SAP Solution Manager models that help you realize holistic and standardized ALM. In addition, we describe the integrated quality management process that covers the entire lifecycle. We also cover how to create the prerequisites for ALM, outline the methodologies available, and shed light on how to install and configure SAP Solution Manager.

Chapter 3, Introducing the Measurement Platform, introduces the measurement platform for ALM, originally defined and successfully executed for the SAP User Group Executive Network (SUGEN) Key Performance Indicator (KPI) program. The ultimate goal of the measurement platform, which is implemented on SAP Solution Manager, is to provide complete, reliable, and comparable benchmark data. The KPIs and metrics must be measurable and represent a particular TCO driver properly, respond to SAP Enterprise Support offering (tools, services), reflect the status regarding the SAP Enterprise Support report, and manifest the achieved benefits. It is important to emphasize that the entire value of SAP Enterprise Support is not measured directly by these KPIs. The underlying concept of ALM goes far beyond the set of KPIs measured.

The Customer Center of Expertise (Customer COE), SAP's new model for the organization and scope of a customer's support organization, is the topic of Chapter 4, Customer Center of Expertise. Whereas a classical SAP CCC focused mainly on reactive support tasks and was deeply embedded in a customer's IT organization, a Customer COE is focused on actively driving accelerated innovation for the customer's business units; that is, the Customer COE focuses on upgrades, the implementa-
tion of new software, and the use of SAP enhancement packages (EHPs). This presupposes that a single source of truth has been established in the customer’s SAP Solution Manager.

Based on the organizational model outlined in Chapter 4, Chapter 5, *Preserving Business Continuity*, describes the role of the quality manager for business continuity. It explains the methods and tools available with SAP Enterprise Support in detail, for example, data volume management, root cause analysis, and the Run SAP methodology.

Chapter 6, *Accelerated Innovation*, is dedicated to the tasks of the quality manager for integration validation. Here, the focus is placed on how test management and integration validation can contribute to faster innovation in highly integrated IT solutions.

In Chapter 7, *Improving Business Processes*, we describe how you can explore the potential for optimization. By leveraging the role of the quality manager for business process improvement and using tools such as business-process monitoring, you can unlock this potential.

The protection of your IT investment is the main topic of Chapter 8, *Protection of the IT Investment*, with particular attention being paid to managing custom code. The tasks and goals of the quality manager for protecting the IT investment are described step by step using a real-life example, which covers items such as avoiding or reducing custom development, and creating an IT master plan.

Chapter 9, *Innovating without Risking Disruptions*, explains how you can avoid downtime using the SAP release strategy, and how you can drive innovation without upgrades using SAP EHPs. Tools such as the maintenance optimizer and the SAP EHP installer, as well as optimized upgrade procedures, are introduced.

Under the umbrella of SAP Enterprise Support, SAP offers support models such as SAP MaxAttention and SAP Safeguarding, which are explained in context in Chapter 10, *SAP MaxAttention and SAP Safeguarding*.

backbone and how mission-critical support for partner applications and technologies is enabled. The chapter also details how value-added resellers are integrated into the SAP ecosystem.

Chapter 12, Run SAP Programs for SAP Partners, describes the Run SAP implementation and operations initiatives for partners. These initiatives provide knowledge transfer to partners and enable them — through comprehensive training and certifications — to deliver premium strategic services to their customers.

A short overview of the training courses available for SAP Enterprise Support is provided in Chapter 13, Overview of Training and Certification Offerings.

The appendix provides additional information, for example, about the expert-guided implementation for SAP Solution Manager, or a detailed description of the CQCs offered by SAP AGS. You will also find information on SAP internal standards and learn how you can profit from these standards in SAP Enterprise Support.
SAP Enterprise Support provides a broad portfolio of services with which you can run your IT solutions end to end, at minimum cost. This concept is based on a unique central database (single source of truth) that is accepted by all stakeholders.

2 Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

To create a single source of truth that enables all stakeholders to cooperate efficiently and effectively throughout all phases of the application lifecycle, you need to be familiar with the basic concepts of application lifecycle management (ALM). Establishing these concepts in your enterprise is a crucial step toward effective and efficient ALM, which, in turn, enables you to reap the full benefit from SAP Enterprise Support.

2.1 Basic Concepts

The SAP Solution Manager is the standard platform for ALM. It is one of the central components of SAP Enterprise Support. The book *SAP Solution Manager Enterprise Edition*¹, also published by SAP PRESS, contains a detailed description of the SAP solution for application management and administration. The most important concepts for creating a single source of truth are presented in the following sections.

2.1.1 Application Management Lifecycle

Application management can best be described as being based on a lifecycle. This book is based on the application management lifecycle described in version 3 of the IT Infrastructure Library (ITIL). Application management is a comprehensive support approach in the application environment that spans the entire lifecycle of IT solutions, from concept to phase-out. The lifecycle has six phases (see Figure 2.1), as follows:

- **Requirements**
  Collect requirements for new applications or for adapting existing applications.

- **Design**
  Convert requirements into detailed specifications.

- **Build and test**
  Configure the application, and create an operating model according to specifications.

- **Deploy**
  Transfer changes and the operating model into the existing live IT landscape.

- **Operate**
  Provide IT services for ongoing operations.

- **Optimize**
  Analyze service-level fulfillment, and perform any activities required to improve results.

This book describes the key tasks during this lifecycle. Sections 2.3, Business Configuration, and 2.4, Business Continuity, explain how to perform these tasks.

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2 In the literature, the term *business continuity* is often used for "disaster recovery." In that context, business continuity describes the continued operation in outsourced computing centers after a complete destruction of the primary computing center due to natural disasters, attacks, and so on. We use the term in a slightly different manner based on SAP’s experience that system downtime results more frequently from defective transports, data inconsistencies, or system administration mistakes than from natural disasters. It is the task of the quality manager for business continuity to assess and avoid these risks, and to ensure continued business operations.
2.1.2 Projects in SAP Solution Manager

A project in SAP Solution Manager describes the grouping and organization of business, technical, and organizational tasks during the implementation of SAP software in an enterprise. In an implementation project, the project team performs tasks that are structured according to a common project plan and roadmap. In SAP Solution Manager, projects follow the ASAP methodology, starting with project preparation and completing the project in the go-live phase.

From the lifecycle perspective, a project covers the application management phases from requirements gathering through building and testing. All information you have accumulated during the project is cut over into a solution at the end of the deploy phase, including knowledge transfer to end users via e-learning, implementation of the support organization, and so on.

Using SAP Solution Manager for projects has many advantages, including the following:

▶ A structured, systematic procedure throughout the project.

▶ Strict adherence to a process-oriented approach that is separate from individual applications and components. This provides a more comprehensive view of process flows in heterogeneous system landscapes.
Centralized metadata repository for solutions, including documentation, test cases, and configuration information.

No information loss between project phases. Once created, content is reused throughout the software lifecycle, preventing integration gaps.

A Solution Manager project covers the business configuration in the application management lifecycle, that is, all phases from the requirements phase through the preparation of production processing (deploy phase).

### 2.1.3 Solutions in SAP Solution Manager

After you have successfully completed a project, the challenges during operations are preserving the knowledge gained during the project and keeping it up to date. The SAP Solution Manager solution concept helps you do so. During the deployment into productive use, all of the information accumulated in your project is transferred into a solution. An SAP Solution Manager solution contains all of the information about systems, software components, and business processes (scenarios) needed in the operation and continuous optimization of your IT solution. This ensures that all information remains accessible and can be consolidated when a project is over.

A solution covers a longer period of time than a project, providing all of the information needed for operations and the preparation of optimization projects. The integrity of your solution is the key to successful ALM.

The solution is also crucial as an information source for ALM in two dimensions:

- Horizontally, any software component required to complete the customer’s business processes as documented in the solution documentation can be managed using the ALM processes.
- Vertically, every layer of the solution can also use these processes, including database, and IT assets.
You manage solutions in the solution directory, which offers the following advantages:

- **All assignments are in the SAP Solution Manager project**
  - Scenario and business process structures are transferred to the solution.
  - Configuration object assignments are readily available.
  - Test cases in the structure can be used to test changes that have been made.
  - E-learning materials from projects in the solution can be reused.
  - The solution has the same system landscape as the project; therefore, you can reuse the structure when you upgrade.

- **Standard presentation of solution components such as servers, systems, business processes, and scenarios**
  - The display of graphics and diagrams is enhanced.
  - You can export graphics to Microsoft Office or HTML.

The solution completely covers business continuity in the application management lifecycle in SAP Solution Manager, that is, from deployment to optimization.

Fulfilling the minimum recommendations for SAP Enterprise Support means that you have documented your core business processes. Usually, there are very few — according to SAP’s experience: one to five — core business processes within a company. Core business processes are the most important processes, which, when disrupted, lead to a severe impact on the company’s business.

Critical business processes are new or technically challenging business processes, for example, processes with custom development or non-SAP components needing high awareness or monitoring.

Documentation in SAP Solution Manager is not designed to model every process step variant and detail. It is intended to provide an understandable structure, with information relevant to other teams and other application lifecycle capabilities.
Example

**Manufacturing Industries Example: Material Supply of the Production**

The material supply process is a critical core process because the company loses money if material outages occur:

- If this process is disrupted, and material outages arise, the production of finished parts will be impossible. If this happens, the company has to change production plans, causing higher total production cost.
- Customer orders will not be delivered in time, so that customer satisfaction decreases.

### 2.1.4 Processes for Application Lifecycle Management

SAP provides 10 processes to support both projects and solutions (business configuration and business continuity) throughout the lifecycle (see Figure 2.2), as follows:

![Figure 2.2 Application Lifecycle Management (ALM) Processes](image)
Solution Documentation

Consisting of technical landscape documentation and business process documentation, solution documentation is the basis for all other SAP Solution Manager capabilities. It describes a customer’s SAP and non-SAP technical components, core business processes, and interfaces. The documentation also includes custom code and modification documentation, as well as links to supporting technical objects, such as transactions and programs.

The correct use of implementation projects automatically leads to sufficient solution documentation in the operations and optimization phase. If you start with the documentation in the operations phase, you should re-document your core business processes in SAP Solution Manager. In relation to a complete implementation project, only a subset of information is then needed.

Solution documentation can be continuously enriched along the ALM life-cycle phases (see Figure 2.3):

- **Design**: Create global business process templates and specifications for later rollout of regional implementation projects.
- **Design/Build**: Create or locally adjust the business process structure during your regional implementation project.
Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

- **Build/Test**: Extend business process documentation during solution configuration with custom code documentation, configuration information, and test cases.
- **Operate**: Re-document or adjust your business process documentation during operations with system information, and adjust process documentation after go-live.
- **Optimize**: Verify your business process documentation before upgrades; for example, delete obsolete information and not used custom code.

Solution documentation is the basis for the whole application management lifecycle. It ensures that customers achieve transparency of their IT solution landscape and business processes. It also fully exploits the potential of SAP Enterprise Support.

- **Solution Implementation**
  Involves the identification, adaptation, and implementation of new and enhanced future-oriented business and technical scenarios. It is designed to decouple technical installation from business innovation and uses SAP Solution Manager to implement innovation within the system landscape.

- **Template Management**
  Allows customers with multi-site SAP installations to efficiently manage their business processes across geographical distances, such as part of a global rollout approach: from initial template definition to template implementation and template optimization.

- **Test Management**
  Allows you to define the integration testing requirements and test scope based on a change impact analysis, develop automatic and manual test cases, manage testers, and report on the test progress and test results.

- **Change Control Management**
  Provides workflow-based management of business-driven and technology-driven solution improvement changes with integrated project management, quality management, and synchronized deployment
capabilities, to best manage the risks associated with the implementation of the solution, ensuring technical and functional robustness.

- **Technical Operations**
  Represents all capabilities for monitoring, alerting, analyzing, and administering SAP solutions, and allows customers to reduce TCO by using predefined content and centralized tools for all aspects of SAP Solution Manager operations. It provides end-to-end reporting functionality either out of the box, or individually created by customers.

- **Business Process Operations**
  Comprises the most important application-related operations topics necessary to ensure the smooth and reliable flow of the core business processes to meet a company’s business requirements.

- **Application Incident Management**
  Enables centralized and common incident and issue message processing on multiple organization levels and offers a communication channel with all relevant stakeholders of an incident. The process includes business users, SAP experts at the customer site, SAP Active Global Support (SAP AGS), and partner support employees. It is integrated in all ALM processes of SAP Solution Manager and in any SAP Business suite solution, can be connected to a non-SAP help-desk application, and includes follow-up activities such as knowledge research, root cause analysis, or change management.

- **Upgrade Management**
  Represents the identification, adaptation, and implementation of new and enhanced business and technical scenarios, and uses SAP Solution Manager to holistically and effectively manage the upgrade project end to end. It allows SAP customers to better understand and manage the major technical risks and challenges within an upgrade project, and to make the upgrade project a non-event for the business.

- **Maintenance Management**
  Covers software correction packages: from discovery and retrieval to test-scope optimization, possibly including optional automatic deployment into the production environment.
2.1.5 Quality Gates in SAP Solution Manager

Highly integrated solution landscapes require a controlled and quality-assured change-management process for solutions to be reliable and highly available. Most changes and extensions in the application lifecycle of SAP-centered solutions are motivated by changes in the application layer. Custom developments and customizing changes are managed in projects and transported from the development system via the test system to production systems. These types of changes require a formal quality management process — covering all phases of the application management lifecycle (see Figure 2.4) — until they are transported into the production landscape.

**Figure 2.4 Quality Gate Management Process**

Q-Gate A quality gate (q-gate) is a type of milestone in SAP Solution Manager project management. It controls the import of project data into subsequent systems. Data can be propagated into subsequent systems only if a q-gate has the status passed.
All activities in the q-gate management process are supported by SAP Solution Manager 7.0 EHP 1. In addition to the existing functionality, such as change request management, test management, and incident management, several new functions are available, as follows:

- **Q-gate management**
  Provides complete transparency of changes and enables formal transitions between phases via q-gates.

- **Synchronized transport management**
  Collects changes and transport requests from all development workbenches and for all SAP-supported development environments (ABAP, Java, Microsoft .NET, and C/C++). Transports from various systems can be synchronized to guarantee availability of all dependent developments and changes in subsequent target system landscapes.

- **Work center change management**
  Lists views and calendar views for all q-gates, changes, and transports.

New test management functions, such as BPCA, are described in Section 6.1, Integration Testing.

At all major q-gates (typically at the transition point from one lifecycle phase to another or to sign off critical custom developments or custom configurations), the SAP AGS organization empowers and supports you with feedback and formal sign-off procedures to help ensure that solutions work properly.

### 2.2 Implementing SAP Solution Manager as a Standardized Platform for Application Lifecycle Management

SAP Solution Manager supports planning, setup, implementation, training, and operations throughout the entire application lifecycle. This section outlines how to approach the installation and configuration of SAP Solution Manager. It also describes which tools and methods are embed-
2.2.1 Planning

The SAP Solution Manager Run SAP roadmap function provides the Run SAP roadmap as reference material. You can read how certain end-to-end standards are implemented, and you can access best practices information — provided via accelerators — in the roadmap.

The roadmap in the Run SAP methodology provides content for SAP industry solutions — mainly business process operations. You can use filters and selections to restrict the roadmap content. The Run SAP roadmap can be used together with project management functionality to define and manage a Run SAP project to implement or optimize operation processes.

The SAP Solution Manager master guide supports you in all relevant planning steps for an SAP Solution Manager implementation, such as SAP Solution Manager architecture, sizing, and agent deployment strategy to the managed systems.

2.2.2 Installation and Configuration of SAP Solution Manager

The configuration effort depends heavily on the use of the SAP Solution Manager and the number and type of systems connected to it.

Through a guided procedure, the basic configuration is now very comfortable and takes only a short time, after which you can already use most of the SAP Solution Manager scenarios, including all functions for SAP Enterprise Support. Three main ways of using SAP Solution Manager are supported depending on the customer’s situation:

- In an implementation and upgrade project
- To support core business processes in operational processing
- For the administration, maintenance, and monitoring of your system landscape, and for technical service-level reporting
If additional configuration effort is required, it is usually only necessary to select and implement content, not technically configure a function. The effort required can be considerable, particularly for system monitoring and service desk and job management. Organizational arrangements are typically significant in change request management and business process monitoring.

The following explains and underscores the significant potential already available to you after the basic configuration of SAP Solution Manager. SAP Solution Manager is installed using a standard procedure that is supported — primarily for troubleshooting — by the SAP Solution Manager installation guide for the combination of system and database.

You can prepare SAP Solution Manager and connect managed systems in the development, quality assurance, and production layers using the basic configuration assistant (Transaction: SOLMAN_SETUP; see Figure 2.5 and Figure 2.6). The assistant considerably simplifies and accelerates both the initial installation and future upgrades of SAP Solution Manager; thus, an average system landscape containing only a few systems can be configured within a few days.

After basic configuration has been completed, and managed systems are connected to SAP Solution Manager, you can create projects and solutions within solutions.
Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

Managing connected systems

You can do the following with all connected systems:

- Display all connected systems in a standard solution called SAP solution.
- Create solution documentation with an assistant.
- Process SAP EarlyWatch Alert weekly (automatically scheduled).
- Download SAP software with the maintenance optimizer.
- Perform end-to-end root cause analysis.
- Collaborate with the SAP Services organization to do the following:
  - Plan service delivery and engagement.
  - Receive continuous quality checks (CQCs).
  - Create incidents (service desk messages) or issues and send them to SAP AGS.
  - Open a connection for remote support by SAP Services or SAP partners.
- Administer systems using preconfigured standard tasks, including reporting.
- Perform technical service level and IT reporting.
- Perform real-time system monitoring with automatic alerting.
- Use self-services, such as data volume optimization.

If you have created a maintenance project, you can manage q-gates along the project lifecycle. You can document the business process and custom code, perform business configuration, manage tests, and, with
additional configuration, transport synchronously across stacks — according to the business process structure blueprint — in projects. If you have more formal documentation requirements, you can benefit from change request management (again, with additional configuration).

You can model business processes and map business process steps and interfaces to the connected systems in projects and solutions. SAP recommends that you document mission-critical core business processes, including custom code, in SAP Solution Manager, to benefit from the following:

- The modification justification check and custom-code maintenance check (see Sections 8.4.6, SAP Standard for Solution Documentation for Custom Development, and 8.4.7, SAP Standard for Custom Code Management)

- Business process operations (with additional configuration):
  - Business process and interface monitoring
  - Job request management
  - Data volume management
  - Data consistency cockpit

SAP offers a comprehensive training curriculum and services such as expert guided implementation for SAP Solution Manager, as well as CQCs to help you with these tasks. For further details, see Chapter 13, Overview of Training and Certification Offerings, and Appendix A, Additional Information and Offerings.

### 2.3 Business Configuration

As explained in the previous sections, business configuration covers the application management lifecycle phases: requirements, build and test, and deploy. In the deploy phase, a project is passed to the operations organization. Therefore, this phase is the changeover from project to solution environment in SAP Solution Manager and affects both business configuration and business continuity.
2.3.1 Requirements Phase

Evaluate scenarios During the requirements phase, your primary concern is to evaluate scenarios and their business processes, and check their viability for your project. Planned change requests emerge during the operate and optimize phases, followed by assessment and technical feasibility checks to prepare the subsequent decision-making milestone. In SAP Solution Manager, you can use SAP Business Maps and Engagement tools for knowledge transfer and more detailed process analysis. This content is contained in the business process repository (BPR), a content library that includes content designed specifically for implementation purposes, which you can use in your projects (see Figure 2.7). You can access the BPR via SAP Solution Manager or use its online version at https://implementationcontent.sap.com/bpr.
In a project, you can benefit directly from SAP’s internal business-configuration standard, which provides you with software and content from SAP. This gives you a head start in implementation projects because you do not have to start from scratch. You, therefore, benefit from best practices and end-to-end processes that you can adapt to your own business requirements.

In many projects, you need to first analyze which transactions and processes are currently in use so that you can define the project scope. SAP Solution Manager provides a function to automatically analyze systems and business processes: the solution documentation assistant.

### Requirements Phase: What SAP Enterprise Support Offers for You

**Benefit Case: Next Best Practice Included**

Continuous improvement is at the heart of SAP Enterprise Support in this phase. The ultimate goal is to get the most out of the innovation provided by SAP; the first steps toward this goal are taken here. SAP Enterprise Support explicitly facilitates the adoption from an end-to-end perspective: You can pick the software that covers your requirements and install only the scope that helps you maximize the value of your IT solution.

- Benefits for customers: Increased business satisfaction
- Benefits for partners: Built-in continuous improvement and standardization increases customer satisfaction

**Core Assets**

Core assets of SAP Enterprise Support for the requirements phase include the following:

- SAP Business Maps and Engagement tools
- BPR and configuration guidelines

**SAP Enterprise Support Services**

- Accelerated innovation enablement: Five days of remote support from solution/technology architects (from solution management) to support the deployment of the latest enhancement package (EHP) and to help you identify what innovation helps you improve your business processes.
2.3.2 Design Phase

To deal with potential bottlenecks quickly and efficiently, you need professional, visible project management procedures and a clearly defined project scope. With these in place, you can safeguard your company’s investments, deploy resources for specific objectives, set priorities, and ensure that everyone involved in a project communicates clearly.

**Project management procedure**

The role of SAP Solution Manager during this phase is to provide roadmaps — proven procedures for project management — and to structure project management activities clearly, using tools such as the project administration functions. SAP Solution Manager helps you draw up a well-defined, comprehensive conceptual design — a business blueprint — for your project.

**Business blueprint**

The purpose of the business blueprint is to outline the current situation — as identified during workshops — to document the target state for the solution being implemented and the resulting requirements. The conceptual design drawn up by the project team describes how your enterprise plans to map its business processes using both SAP software and non-SAP software.

This phase comprises the following steps:

- Refining the original project goals and objectives
- Finalizing the overall project schedule
- Implementing organizational and change management
- Defining and documenting functional standards for custom developments
- Defining the requirements for the authorization concept, security policy, and end-user training
- Planning the system environment for operations

In SAP Solution Manager, you can draw up your conceptual design in the business-blueprint transaction (SOLAR01). It provides valuable support, especially for mapping and documenting the processes for implementation. The project structure maps business processes to technical objects (see Figure 2.8).
The decision whether planned changes can be carried over into the build phase is assigned to the members of the q-gate design to build team. During the q-gate meeting, members discuss all relevant aspects, including reasons for the requirements, priorities, risks involved, mission-critical business processes impacted, and budget availability. The decision is documented and signed by decision-makers. SAP Enterprise Support also offers a fit/gap-analysis and a sign-off by SAP for the blueprint in this phase based on the q-gate design to build.

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<tr>
<th>Relevant SAP Solution Operations</th>
<th>Work Center in SAP Solution Manager</th>
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<tr>
<td>Standard</td>
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<td>Solution Documentation</td>
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<td>Solution Documentation for Custom Development</td>
<td>Solution Documentation Assistant</td>
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2.3.3 Build and Test Phase

The goals of the build and test phase are to develop the software, test it comprehensively, and release it in preparation for production operation.

Solution Implementation

To implement the scenarios and processes you defined in the design phase in the build phase, you must set up the system landscape that will support your scenarios and business processes. You can then adopt the structure used in the business blueprint, which helps you configure your solution around your business processes, and also during subsequent testing activities.
Configuration implementation comprises the following steps:

- Continuous monitoring of project targets, especially costs, deadlines, and resources
- Active implementation of organizational and change management
- Elaboration of training materials and end-user documentation
- Creation of end-user roles, and implementation of your authorization and security concept
- Elaboration and implementation of realization specifications for custom developments

SAP Solution Manager serves as the central repository for the entire project documentation, which includes the business blueprint, technical specifications, and test cases. Documentation is uploaded to the process structure. An approval process also exists for documentation in SAP Solution Manager.

SAP Solution Manager assists you in configuring your systems around your processes. You can navigate directly to the SAP implementation guide (IMG) in the development component systems and set up these systems centrally from within SAP Solution Manager. You can also document configuration settings centrally. All relevant customizing objects are tracked in SAP Solution Manager — at the project level — and can be accessed directly from SAP Solution Manager using the link to the IMG.

SAP Solution Manager supports you in organizing and documenting the results of a range of test activities — from unit testing to integration testing — with its integrated test tool, the test organizer. SAP Solution Manager also has an authoring environment for creating customer-specific learning maps, where you can prepare and distribute training materials for roles.

Changes — such as solution extensions with custom development activities, customizing changes, interface changes, or integration of a partner or third-party application — are implemented during the build phase. Developers perform unit tests, and the quality-assurance department prepares functional and user-acceptance tests for the next phase. A change-impact analysis should be performed to check whether mission-
Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

critical processes are affected by the changes. You should also document solution operations.

During the build-to-test q-gate meeting, members decide whether the development and other change activities are mature enough to be transported from the development to the test-system landscape. The decision and reasons are documented and signed by the q-gate members involved. Only after the q-gate has been passed successfully can data be imported into the following systems.

**Change Control Management**

Contemporary software solutions involve multiple development workbenches and create various file types or transport objects. Many business processes also require multiple applications and components. For example, *trade promotion management* in the consumer products industry requires SAP NetWeaver Portal, SAP ERP, and SAP CRM.

Transports from the development workbenches into the development systems — with user interface (UI) and business logic changes — can be synchronized with standard procedures to guarantee smooth testing in the subsequent testing landscape. Individual transports could cause errors in subsequent systems due to non-synchronized transport of incompatible UI or business logic changes.

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<th>Relevant SAP Solution Operations</th>
<th>Work Center in SAP Solution Manager</th>
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<td>Change Management</td>
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**Test Management**

All relevant types of tests are performed during the test phase, as follows:

- Regression tests
- Integration tests
- Scenario tests
Business Configuration

2.3

- User-acceptance tests
- Performance tests

During business-logic processing, you should perform tests that proactively check data consistency, response times, and exceptions (see Chapter 5, Preserving Business Continuity).

Testers, or automatic test tools, document problems and errors in the incident management process. Root cause analysis can assess complex problems. Problems that need to be fixed require additional activities in the development system, with subsequent transports into the test system landscape.

Test coordinators monitor test activities, the status of open high-priority problems, and retesting activities after problems are fixed.

At a minimum, test-exit criteria must be in place to verify the following:
- User-acceptance tests confirm that business departments agree with planned changes.
- Integration tests verify that transactions with several instances run correctly.
- Regression tests validate that all core business processes can be executed with correct system behavior and results.
- Performance tests demonstrate that changed solutions have acceptable response times.

Final activities at the end of this phase include updates to end-user documentation prior to going live.

The test management process comprises the following steps:
- Create a test plan.
- Create test packages.
- Assign test packages to testers.
- Run tests, and log results.
- Review results.

You can start to generate test plans and test packages from the SAP Solution Manager project structure. Test packages may include manual and
automatic test cases. You can use the SAP Solution Manager automatic test tool extended computer aided test tool (eCATT) to automate the test process and create test data for user-acceptance tests. You can also assign test packages to testers and track the progress of your test activities with SAP Solution Manager.

After a planned change has been approved, a risk assessment sheds light on the effects the change will have on critical business processes. This type of assessment allows the test coverage to be determined on a risk basis: Test activities will focus on changes impacting critical business processes. This reduces the potential amount of effort associated with testing and enables test resources to target risk areas more precisely. You can use the business process change analyzer (BPCA) for general change-impact analysis of software changes on business processes (see Sections 6.1.3, Test Scope Identification, and 6.1.4, Business Process Change Analyzer and EHP Business Functions).

During testing, you can manage collaboration between users and the development team by creating internal messages, logging tests, and monitoring test status. At the end of a test cycle, you can also review the results.

The most important q-gate takes place at the end of the test phase, when decision makers discuss the maturity of all tested changes. This includes test status reports, achievement of predefined quality goals, and test-exit criteria, which are all used to decide whether a change may be transported into the production system landscape. As with the other q-gates, the final decision must be documented, including the information available at the time.

### Integration Validation

You should monitor core business processes — such as creating a sales order — in single-user mode after the functional quality assurance has
been completed. This identifies problems in performance, data consistency, and technical compliance, before they appear in load tests or in productive operations. An end-to-end trace analysis can anticipate possible performance problems in a multi-user environment. Data-consistency problems can also be avoided by analyzing the commit behavior in an end-to-end trace (SQL behavior). You can also prevent technical exceptions that are not visible in the UI of an application but that can still cause significant problems in production.

By closely monitoring the program flow with an end-to-end trace analysis, you can even reduce or eliminate load tests and improve process continuity after changes. Simulating parallel execution in load tests requires a lot of effort for script management and provision of test data. Each reduction of effort for load tests has a significant impact on TCO. If load tests are still necessary, they can be monitored and statistically analyzed with end-to-end workload analysis and end-to-end exception analysis. Instead of logging on to each system, you can analyze load tests from a single point of access, SAP Solution Manager.

This procedure to analyze performance, data consistency, and technical compliance systematically after the functional integration test is called integration validation. SAP extends quality management with best practices and with validation of integrated, cross-technology, and cross-component solutions.

### Build and Test Phase: What SAP Enterprise Support Offers for You

#### Benefit Case: Configuration Content Is Maintained Like Code

The focus of SAP Enterprise Support in this phase is on the reduction of configuration and testing efforts for the customer solution, that is, SAP software as well as horizontal and vertical software and IT assets. The goal is to reduce the cost of labor for configuration and testing as much as possible. This also comprises a reduction of unnecessary modifications resulting in fewer conflicts with SAP support packages and EHPs.

- Benefits for customers: Up to 30% lower configuration costs
- Benefits for partners: Less implementation costs, and support by SAP
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2.3.4 Deploy Phase

Final preparation (deploy phase) involves transferring the results from the build and test phase to the live solution. In this phase, you clarify any open go-live issues, and when this phase has been completed, your production business processes are ready to run in your solution.

As with the build and test phase, test management in SAP Solution Manager is extremely useful during the deploy phase. In this phase, you use the same resources and tools to conduct and document a wide range of system tests on aspects such as performance, load, and interfaces.

This phase is also when you distribute the learning maps created in SAP Solution Manager to end users. Users can use the maps to learn about new functions relevant to their tasks and provide feedback on individual learning units or the learning map as a whole. You can evaluate feedback and use it to improve your training materials.

Going live

The deployment phase is the transition from a pre-production to production-operation environment. It is important to establish support structures for end users that will be available in the long term, not just

Core Assets

Core assets of SAP Enterprise Support for the build and test phase include the following:

- Configuration content and configuration guidelines, user exits, and services (SOA)
- Test workbench
- BPCA
- Test automation support

SAP Enterprise Support Services

- Modification justification check
- Modification maintainability check
- Accelerated innovation enablement: Five days of remote support from solution/technology architects (from solution management) to support the deployment of the latest EHP
during the critical period immediately after going live. You can use the integrated service desk in SAP Solution Manager for this purpose.

One prerequisite for going live is that data verified in the build and test phase has been transferred (cut over) from the legacy system to the production system. Tested configuration settings, modifications, and customer developments are also transported to the production system.

You should engage the SAP GoingLive Check service about two months before you plan to go live. It reduces the risks involved in implementation by identifying potential performance, availability, and maintenance problems, so that you can take corrective measures in plenty of time.

During the go-live and support phase, users gain practical experience working with a solution. This phase requires a well-organized user-support structure that all employees can easily access. This phase also entails monitoring system transactions and optimizing overall system performance. SAP Solution Manager offers a wide range of resources and tools to help you run the solution. For instance, you can monitor the implemented processes across all systems. Especially when a system has not been in operation for long, you should proactively analyze it to identify potential problems, prevent bottlenecks, and monitor system performance regularly and automatically. You accomplish this by setting up the SAP EarlyWatch Alert service in SAP Solution Manager. This tool is also very effective for checking your core business processes and systems.

The SAP EarlyWatch Check service proactively analyzes your operating system, database, and SAP software to optimize performance and provides recommendations and proposals for further action.

After passing the test-to-deploy q-gate, the transport lock may be released, and the final synchronized transport can take place. The project ends when the changed solution can be handed over to the support organization.
Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

SAP also provides CQCs for the implementation. For further information, see Appendix A, Additional Information and Offerings.

### Deploy Phase: What SAP Enterprise Support Offers for You

#### Benefit Case: Go Live on Time and on Budget

SAP Enterprise Support provides a reduction of test efforts for integration and volume testing and at an increased quality management during deployment, resulting in improved business process availability. Q-gate management reduces the stabilization effort, and the suite of root cause analysis capabilities optimizes performance and workload distribution. SAP supports this phase by dedicated CQCs.

- Benefits for customers: Up to 30% lower integration test costs
- Benefits for partners: Less risk of failure as go-live is signed-off by SAP

#### Core Assets

Core assets of SAP Enterprise Support for the deploy phase include the following:

- Root cause analysis tools, including end-to-end trace, SQL trace, and usage and performance statistics
- Best practices and tools for integration validation, performance, and data consistency per business process
- Best practices and tools for sizing and workload distribution, Quick Sizer
- Migration workbench
- Modification justification check

#### SAP Enterprise Support Services

- SAP CQCs for implementation (GoingLive Check for Solutions, Integration Validation, Support Going Live)
- System sizing and configuration content

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<table>
<thead>
<tr>
<th>Relevant SAP Solution Operations Standards</th>
<th>Work Centers in SAP Solution Manager</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Implementation/Upgrade</td>
</tr>
<tr>
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<td>Solution Documentation Assistant</td>
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<td>Change Management</td>
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2.4 Business Continuity

By introducing SAP NetWeaver and service-oriented architecture (SOA), SAP significantly increased the ability of IT to satisfy business demands. However, our customers’ system landscapes have also become significantly more sophisticated. On the customer side, keeping the IT solution available, stable, integrated in the software landscape, and performing optimally is the main challenge of IT service and application management. The number of systems IT has to operate is growing continuously, while IT staffing remains stable. In addition, IT staff needs to acquire new skills to support an increasing variety of technologies and software that can result from acquisitions, as well as from implementing third-party solutions provided by resellers and OEMs.

The task of IT service and application management is to ensure business continuity, while reducing TCO in distributed, heterogeneous environments. Most IT organizations can survive this challenge only by managing their operations “by exception.” In this approach, routine tasks must be automated as much as possible. Instead of sitting in front of a monitoring system, IT staff should be alerted when a system reaches a critical state, a business process is affected, or business continuity is at risk. Reporting used to prove business continuity and the value of IT to the business should be automated as much as possible.

2.4.1 Operate Phase

SAP Solution Manager enables processes to be handled automatically in many different areas, such as system monitoring and error notification, the collection of technical data, report summaries based on SAP Early-Watch Alert, and service-level reporting. Current know-how, as well as task and workflow documentation, is integrated in many areas where administrative responsibilities and other tasks occur, for example, central system administration, solution reporting, and business process monitoring. Automation and the efficient transfer of knowledge provide experts with the time they need to concentrate on their core competences. This, in turn, allows small teams to monitor and manage complex system landscapes, while making the services they offer visible to end users. As a result, SAP Solution Manager makes it possible for you
to keep IT know-how inside your company or outsource it and monitor the services provided.

A key process in solution operations is application incident management, as outlined in Section 5.3.1, Close Cooperation Between QM and Teams.

**Action plan**

For each incident and problem, an action plan is formulated, together with the problem message. Its implementation must be monitored, which may involve system administration activities, such as implementing a patch or changing a configuration.

Two customer IT teams are involved in solution monitoring:

- Business process operations team for business process monitoring
- Technical-operations team for system monitoring

**Solution monitoring process**

The solution-monitoring process runs on both business process and technical system levels:

- The solution monitoring tools in SAP Solution Manager generate alerts.
- The alert solution includes the processes’ business process operations or technical operations. Each alert has a description that explains the alert processing. If the solution is not clear, the alert is given the status of a problem and must be subjected to root cause analysis.

The following sections describe the scope of technical operations, business processes, and application management.

**Technical Operations**

Technical operations include system and end-user experience monitoring (see Section 5.3, Managing Business Continuity from the QM’s Perspective) and the routine tasks of system administration.

**System and End-User Experience Monitoring**

Business units expect that performance problems and errors will be detected proactively and resolved before they affect business continuity. SAP NetWeaver, the operating system, and the database are subject to system monitoring to ensure smooth technical operation. During opera-
tions, exceptions may arise from SAP NetWeaver or the underlying technology. Effective and efficient handling of these exceptions is a crucial factor for stable technical operations. Whereas root cause analysis aims at problem resolution, system monitoring detects incidents automatically. When agents report diagnostics data that exceeds thresholds specified in a central alert definition, alerts are created, and the IT experts responsible are notified so they can take corrective action. If the required corrective action is not obvious, root cause analysis is performed to resolve the incident.

SAP Solution Manager provides both real-time and historical monitoring. Real-time monitoring goes down to a granularity of 15 seconds; historical monitoring starts at an hourly level and can be aggregated in SAP Solution Manager to daily, weekly, and annual levels using the SAP NetWeaver Business Warehouse (SAP NetWeaver BW) component.

Real-time monitoring is provided with the dashboard technology in CA Wily Introscope. All dashboards are shipped preconfigured by SAP and are part of SAP Solution Manager. If you want to create your own dashboards, for example, for custom code or legacy applications, you can purchase the SAP Extended Diagnostics application by CA Wily (a reseller product on the SAP price list). This entitles you to use the full version, including all preconfigured instrumentation and dashboards for non-SAP applications.

From the triage view of the SAP NetWeaver Portal component, your IT staff can dive more deeply into monitoring detailed metrics, which are updated every 15 seconds.

To help your IT staff analyze performance and exception development trends, SAP Solution Manager offers end-to-end workload and exception analysis. Both are based on SAP NetWeaver BW in SAP Solution Manager. All required extractors and agents are provided with SAP Solution Manager; you do not have to develop them yourself.

From a user perspective, a well-running server environment does not necessarily guarantee appropriate response times and availability because exceptions can occur on clients, or in the network from the client to the server environment. End-user experience monitoring mea-
sures true response times from a client to a server periodically based on scripts simulating end-user click sequences.

Figure 2.9 shows a self-service timesheet application for which a customer wants to see performance and availability in eight locations. At each location, the customer has implemented agents that continuously monitor end-user experience. In contrast to other end-user experience-monitoring infrastructures on the market, not only does SAP Solution Manager measure behavior on the client, but it also collects statistics and traces that analyze the correlation to the server environment.

**Figure 2.9 End-User Experience Monitoring of a Self-Service Time Sheet Application**

End-to-end alerting System monitoring and user-level monitoring can be automated with end-to-end alerting. Thresholds are defined for key metrics, and alerts are raised automatically by the alerting infrastructure. By automating
monitoring through end-to-end alerting, the same operations staff can run more systems.

The new alerting infrastructure provides open, configurable consumption of alerts, such as exposure to third-party application management, emailing, or SMS text messaging through SAP NetWeaver, and a unified alert inbox that is part of the System Monitoring work center in SAP Solution Manager.

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<thead>
<tr>
<th>Relevant SAP Solution Operations Standard</th>
<th>Work Center in SAP Solution Manager</th>
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<td>System Monitoring</td>
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**System Administration**

Regular routine tasks are part of a customer’s technical-operations manual and include performing backups and restarts, managing printers, and carrying out identity management tasks.

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<th>Relevant SAP Solution Operations Standard</th>
<th>Work Center in SAP Solution Manager</th>
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<td>SAP System Administration</td>
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**Business-Process Operations**

You need to consider and address four basic aspects to maintain a sustainable concept for business process operations:

- Business process and interface monitoring
- Job scheduling management
- Data consistency management
- Data volume management

The following sections describe these aspects in more detail and refer to SAP standards for solution operations. These standards describe the operational processes and the supporting tools used to set up, support, and execute operational processes.
Business Process and Interface Monitoring

The monitoring of business processes and related interfaces is one of the main aspects for a business-operations concept (see Figure 2.10). The goal is to ensure smooth operation and a stable flow of information, according to defined business requirements. During operations, exceptions may arise from within business applications. Effective and efficient handling of these exceptions is a crucial factor for both an optimized TCO and smooth business execution.

![Figure 2.10 Business Process Monitoring](image)
Additional sources of input for monitoring processes are best practice documents for business process operations. Based on standard processes, these documents describe typical monitoring aspects or error situations, provide relevant information about the execution of business process steps, and refer to typical background processing or critical integration scenarios and their interfaces with the software components involved. These documents are available via SAP Solution Manager.

**Job Scheduling Management for Successful Automation Management**

Within a highly comprehensive and distributed landscape, job scheduling management is important to data management and data processing. Even in today’s real-time processing environment, the need to run jobs in the background is significant.

Jobs are concatenated into long job chains, usually containing many job-sequence dependencies. If one, or several jobs abort and cancel, the alert mechanism has to inform the appropriate support level or has to be able to start an automatic error-handling procedure and restart the jobs.

Another aspect of job scheduling management is the efficient use of available system resources, such as CPU and memory. A typical requirement is the coordination of activities of concurrent online users and background jobs that need the same time window and system environment. This requirement needs to be managed to avoid system bottlenecks, performance bottlenecks, or delays in data processing.

**Data Consistency Management Across the IT Landscape**

Transactional correctness and data consistency are crucial factors for the success of each SAP solution. Your daily business operations — from
end-user transactions to management decisions — rely on correct and up-to-date data being available at the right time. As a result, data inconsistencies can have a severe cost impact, resulting, for example, from lost business deals or non-availability of your solution.

Transactional correctness is a solution-configuration requirement — it relates mainly to software functionality and the underlying technical infrastructure. Checks for transactional correctness have to be part of integration testing before a new solution or changes to an existing solution can be used in production. Transactional correctness corresponds to data consistency.

The cause of data inconsistencies in a solution landscape is usually one of the following:

- End users or key users are not aware of manual activities they have to perform to guarantee data consistency. For example, a key user changes master data in one component and sends this update to other systems manually.
- An interface that does not function properly. This is recorded in an error log on one side of the interface and may or may not trigger a workflow item being sent to a person to resolve the issue.
- Jobs are not running correctly or, due to insufficient time, were not started in the first place. If these jobs, for example, load data into a data warehousing solution, business reports are not accurate and may lead to incorrect business decisions.

Data consistency is an important aspect in business process operations. It is vital for the operation to create 100% transparency of all aspects of data consistency.

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<tr>
<th>Relevant SAP Solution Operations Standard</th>
<th>Work Center in SAP Solution Manager</th>
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<tr>
<td>Data Integrity and Transactional Consistency</td>
<td>View Data Consistency Management in the <em>Business Process Operations</em> work center</td>
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Data Volume Management to Manage the Growth of Business Data

Optimal management of business data is another important aspect of business process operations. Data volume management requires technical considerations for optimal storage management for business data. Simply adding additional disks to storage area networks (SANs) and storage subsystems over time may actually make the situation worse. For example, system management can become more and more difficult or performance may degrade.

On the other hand, your business and business-application requirements have an impact on the management of business data. For example, business and legal requirements define the data retention period of critical financial data.

Data volume management consists of the following phases:

- **Data volume scoping**
  This is the starting point of data volume management. When implementing a data volume management strategy, a detailed look at the solution landscape identifies the major pain points and provides an overview of the most beneficial measures to take, such as data deletion or archiving.

- **Data volume management strategy**
  The focus is on the implementation of the methodologies of avoidance, summarization, data deletion, and data archiving (depending on the kind and type of data), and on considering business and external requirements, such as compliance with legal requirements.

- **Data volume reporting**
  Data volume reporting lists archiving activities already being performed and identifies additional reduction potential that may be realized by changes in business processes. Scheduling this activity on a regular basis can show the growth of the database — at the business-object level — and identify how growth can be minimized.

Reaching a “steady state” — that is, the balance between additional new data and archived data — is an SAP standard required to run SAP solutions within given service-level agreements (SLAs) through future time periods.
Application Incident Management

Application incident management is used during the testing phase to collect all errors. It is also used after going live as the central incident-management function. Messages can be forwarded to SAP, if necessary, and tracked with SAP Solution Manager until the problem is fixed.

The service desk in SAP Solution Manager is a trouble-ticket tool that is integrated into all important functions of SAP Solution Manager and the connected managed systems. Whenever problems arise during operation, end users create service-desk messages. The service desk then directs these messages automatically to the correct place within the customer's support organization. Here, or in close collaboration with SAP AGS, the message is processed and resolved. The service desk provides everyone involved in the incident management process with central access — at all times — to the information relevant to them, including system information. The service desk simplifies the process of managing error messages and considerably reduces the time required to process incident and problem management.

The following scenarios can be mapped using the service desk:

- A global group and a global support organization
- Multiple segments of a group, and a common support organization
- A service provider that manages several companies

Root cause analysis is tightly integrated into incident management; it is triggered by either incident management (user interaction) or solution monitoring (system monitoring or business process monitoring).

When an IT problem occurs, it can be recorded, categorized, and prioritized in the service desk of SAP Solution Manager, either by an end user or an IT employee. The service desk message is sent to first-level sup-
port, which attempts to clarify the problem, and searches both the customer’s solution database and the SAP Notes service database. If a solution is not found, application management (second-level customer support) begins by carrying out a root cause analysis.

SAP provides monitoring for both the technical operations team (described in the system monitoring standard) and the business process operations team (described in the business process and interface monitoring standard). The teams’ sole aim is to proactively detect errors and performance bottlenecks before they affect business continuity. Alerts are triggered based on thresholds and notify the responsible IT team.

The goal of solution monitoring is the proactive detection of incidents; the goal of root cause analysis is incident resolution. For example, a memory-intensive activity on a specific system triggers an alert in the system monitor. The cause of this unusual memory growth is not clear; root cause analysis may point to a memory leak in custom-developed software.

### Relevant SAP Solution Operations Standard

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<thead>
<tr>
<th>Work Center in SAP Solution Manager</th>
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<tr>
<td>Incident Management</td>
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<td>Business Process Operations</td>
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</table>

**End-to-End Root Cause Analysis**

If an end user experiences a performance problem in a browser, the performance hit may be in the client, the network, or somewhere in the server environment, which itself comprises different instances of different technologies. Server-side processing may take place in SAP NetWeaver Portal (based on Java technology), then continue on to SAP ERP on the backend (based on ABAP), and finally call the database and storage subsystem for data retrieval. A performance problem or functional defect may occur at one or all stages of this roundtrip activity launched by an end user from a browser. End-to-end root cause analysis helps identify the specific components that cause a performance bottleneck.
When the service desk within the business unit cannot solve an incident, the application management team performs end-to-end root cause analysis to isolate the component responsible for a functional defect, or a performance problem: client, network, various SAP applications (such as SAP NetWeaver Portal, SAP CRM, and SAP ERP), database, or storage.

Root cause analysis

SAP Solution Manager supports end-to-end root cause analysis to identify the component that is responsible for the error. This top-down approach helps you systematically target the cause of the error; you no longer have to perform an untargeted, intuition-based approach using various component experts. The latter method involves much more time and expense.

You can envision the end-to-end root cause analysis approach as a type of crime scene investigation, systematically leading to the solution.

End-to-end root cause analysis is supported by the following:

- **End-to-end change analysis**
  Provides transparency on changes (code, business configuration, and content) that were applied recently to a production application. This analysis is particularly important if a few ad hoc changes result in disruptions after they were applied.

- **End-to-end workload analysis**
  Provides unified access to server-side workload statistics.

- **End-to-end exception analysis**
  Provides unified access to exceptions reflected in high-severity log entries and dumps. Component-specific log and dump viewers can be accessed directly from this analysis.

- **End-to-end trace analysis**
  Records performance and functional defects in a single activity of a single user or process, from browser to disk. The measurement is started at the UI of the end user, and the trace level for the roundtrip is selected. When the request gets to downstream servers, all components switch their traces on or change the log level according to the selected trace level.

The example in Figure 2.11 shows an end-to-end trace analysis. Within this analysis, a complete flow trace of the end-user activity is recorded,
starting at the browser and ending at the disk. In this case, the request leaves the browser, passes the SAP NetWeaver Composition Environment (SAP NetWeaver CE), and goes to a backend application. In this example, most of the time was spent in SAP NetWeaver CE. The end-to-end trace analysis allows drilling down to the code level that is responsible for the performance bottleneck.

![End-to-End Trace Analysis](image)

**Component Root Cause Analysis**

After the application management team has performed an end-to-end root cause analysis and has identified the problematic component, incident management enables the issue to be forwarded to the correct expert in custom development, business process operations, technical operations, or IT infrastructure.

Various tools are needed to complete the different tasks in component root cause analysis. In a distributed customer solution, these tools may
be located on different systems. SAP Solution Manager provides a central access point to the system landscapes and simplifies access to the required tools.

**Analysis by SAP or SAP Partner**

Even though every customer should perform preparatory work and end-to-end root cause analysis of an issue, many IT organizations are not able to resolve all problems themselves because this requires in-depth knowledge of specific SAP components. SAP, or its partners, may have to get involved as needed. For experts to be able to provide efficient support, they need access to the customer’s IT solution landscape.

The remote-supportability standard describes how customers can provide remote access to the required tools and how SAP reduces the risk involved in this activity.

By giving external experts access to the tools and related data required to solve an issue, customers can accelerate the delivery of support services and reduce costs. SAP provides all tools required to perform end-to-end root cause analysis to customers, partners, ISVs, and SAP consultants, who can then access these tools remotely and safely through a secured connection to the customer.

How does SAP reduce the risk of uncontrolled, or even inadvertent, changes to the productive environment? This is achieved by read-only authorization policies of the individual root cause analysis applications. Access to productive servers at the operating-system level should be given only in exceptional situations. Such system access can be avoided by continuously collecting operating system statistics in SAP Solution Manager, as well as by using the command console of the operating system, which allows read-only execution of operating system commands. These tools are also instrumental to a customer’s application-management team, as the IT infrastructure team often does not allow operating system access to their production servers.

<table>
<thead>
<tr>
<th>Relevant SAP Solution Operations Standard</th>
<th>Work Center in SAP Solution Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root Cause Analysis</td>
<td>Root Cause Analysis</td>
</tr>
</tbody>
</table>
**IT Reporting**

To demonstrate the value of IT to the business, SLAs are aligned between business units and IT. To confirm that the service levels agreed upon between IT and business are met, SAP provides IT reports that you can adapt to meet your specific needs by tailoring them to the relevant SLA. After you have configured these reports, they can be generated and broadcast automatically to defined recipients in your business or IT organization.

SAP EarlyWatch Alert is a standardized IT benchmark that customers cannot change; therefore, the flexibility in SAP-provided service-level reports to compile IT reports based on SAP EarlyWatch Alert reporting content in a more customizable form is limited.

If you require full flexibility for IT report compilation and broadcasting, SAP recommends you use customer-specific reporting. Technically, the diagnostics-data collection consists of gathering and exporting relevant KPIs, on a continuous basis, into the SAP NetWeaver BW layer of SAP Solution Manager. This happens after the basic setup of SAP Solution Manager has been completed.

This data is used already by end-to-end root cause analysis and end-to-end monitoring, but it can also be used for automated, highly customized IT reporting. With SAP NetWeaver BW, systematic aggregation from hour cubes to day cubes, to more coarsely granulated cubes, is performed continuously. This enables you to create your own Web templates and embedded queries, resulting in completely customized IT reports and broadcasting features. You do not have to create the data collection and extraction infrastructure and content on your own. Furthermore, no programming is required to compile customized IT reports. The IT reports, and their broadcasting, can be modeled with a graphical report builder in the SAP NetWeaver BW layer of SAP Solution Manager; cube content is already populated by the end-to-end diagnostics infrastructure.

SAP also offers CQCs for this phase. You will find a detailed description in Appendix A, Additional Information and Offerings.
2.4.2 Optimize Phase

The optimize phase is a time for making sure that software changes are planned and implemented consistently, after your software is in operation. SAP Solution Manager supports you in this task with its functions for managing change requests. If you need to make significant changes, such as upgrading a software component in your solution, the tool lets you take a professional approach using tried-and-tested procedures.

Operate Phase: What SAP Enterprise Support Offers for You

Benefit Case: Operation Content Is Maintained Like Code

Because the operations phase is the longest phase in the lifecycle, SAP Enterprise Support offers processes and services to reduced planned and unplanned downtime. To ensure business continuity, the support engagement provides protection of investment by innovation without upgrade, built-in business process monitoring, and system and interface monitoring processes, as well as capabilities for data consistency and data volume management.

- Benefits for customers: 99.x% business process availability
- Benefits for partners: Less risk of failure by mission-critical support by SAP

Core Assets

Core assets of SAP Enterprise Support for the operate phase include the following:

- Business process monitoring best practices
- System monitoring best practices
- Application incident management for the customer solution and incident knowledge base (SAP Notes)
- Best practice for creating and maintaining the operation handbook
- Dedicated production down support (7x24)

SAP Enterprise Support Services

- SAP CQCs (e.g., EarlyWatch Check, Remote Performance Optimization, Business Process Performance Optimization, Data Volume Management, Security Optimization Check, Business Process Management, Business Process Analysis, Solution Transition Assessment)
- Prio 1 and Prio 2 SLAs for root cause analysis and issue resolution recommendations
Another challenge you may face during the optimize phase is distributing a template defined at the head office to your organization's subsidiaries. SAP Solution Manager’s answer to this challenge is the global rollout function.

To keep your software landscape up to date, you must consider three types of software changes:

- Support package updates
- Software upgrades
- SAP EHPs

**Support Package Updates**

Installing support package updates is an ongoing task. Support package implementation is planned on a yearly basis, and SAP strongly recommends that you implement the latest support packages. By doing so, you ensure that your company’s software is at the latest status of a certain release. This means it has all of the available corrections and improvements, and this helps your, as well as SAP’s support and development.

Knowing the exact status of your software can dramatically reduce the time it takes SAP to support your software. As a result, software stability and availability can increase significantly.

With the maintenance optimizer, SAP Solution Manager enables a holistic update process. The maintenance optimizer provides the following functions:

- Lists available support packages for all installed SAP applications
- Allows direct download and installation of patches
- Checks compatibility of patches by considering dependencies among different systems

Upgrade management functionality provides you with an overview of the support package level of all SAP applications from one central tool. It checks for new patches for your installed SAP landscape, taking into account possible dependencies among different systems.
Software Upgrades

Changing business conditions lead to changing IT solutions, and every evolving organization needs to adapt its IT environment accordingly. In many cases, this drives the need to upgrade your SAP software. Upgrades allow you to benefit from the latest available functionality, leverage new technologies that foster innovation, and get long-term protection of IT investments.

Details of upgrade-related tasks and the technical upgrade itself may vary depending on product, release, platform, and interface constellation. However, you should give your full attention to the following tasks:

- Align the upgrade program with corporate business and IT strategies.
- Plan the IT infrastructure.
- Adapt applications and custom developments.
- Manage parallel changes during the upgrade project.
- Manage Unicode conversions and other data changes.
- Minimize business downtime.
- Ensure business continuity.

Align the Upgrade Program

Large enterprises usually maintain a number of complex solutions that consist of software from different vendors, include multiple releases of the same software product; or incorporate same-release software at multiple support package levels. In addition, organizational factors, such IT-provider concept, data-center concept, or server architecture, drive complexity.

Within these environments, mutual dependencies among the systems always exist. Therefore, an SAP release upgrade almost always triggers changes in all levels of the solution landscape and may require addi-
tional hardware resources. When planning an individual upgrade, you have to consider such changes, and you may decide to make IT changes in combination with the upgrade. This could save effort and costs for the individual project. Thus, it is very important to update your corporate global IT program definition in the specific context of an upgrade, before starting the first individual project.

As the basis for an update of your corporate strategy, you need to have full transparency of the current situation. Thus, complete and reliable documentation of all solution components in the solution directory of SAP Solution Manager and an overview of every IT project documented in SAP Solution Manager are crucial for the planning and execution of an upgrade project.

**Plan the IT Infrastructure**

Proper infrastructure planning is a prerequisite for a successful upgrade, as well as for a reliable and well-performing target solution. Two major challenges exist: ensuring the compatibility of all connected software components, and correctly sizing the hardware needed for the future solution.

In general, you need to consider two dimensions of compatibility for complex solutions. First, the vertical stack consisting of SAP software components: the SAP kernel, operating system, and database have to be checked for compatible combinations and restrictions of the upgraded versions.

SAP publishes its *product availability matrix* (PAM) on the SAP Service Marketplace (http://service.sap.com/pam); here you can retrieve the released combinations. For add-ons, you should also check the respective release restriction and add-on release strategy notes. To find this information, enter the add-on name and the search string “release strategy” into the SAP Notes search box on the SAP Service Marketplace.

The compatibility or interoperability among different SAP and non-SAP applications has to be verified when one of them is upgraded. The *upgrade dependency analyzer* (UDA) helps you analyze known dependencies when upgrading technical components in your landscape. Accessible from the SAP Service Marketplace under http://service.sap.com/uda,
Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

this tool provides dependency information to support the planning of upgrade projects. The tool can compare two applications at a time: the application being upgraded, and one other application in the solution landscape. The output is an online dependency statement, and an optional reference to SAP Notes.

The UDA is a high-level planning tool for upgrades but does not cover all dependencies relevant for planning an upgrade. For more detailed information, especially with respect to process or scenario information, refer to the scenario and process component lists located at http://service.sap.com/scl.

In all cases, you should consult the SAP master guide and upgrade guide. These guides refer to specific standard SAP Notes that always reflect the most current status regarding release restrictions.

Capacity planning

Determining the correct size of all relevant system resources is a crucial aspect of an upgrade. This lets you achieve good performance without bottlenecks, while spending an appropriate portion of the upgrade budget.

It all starts with a clear picture of the current situation, which can be obtained easily by using the SAP EarlyWatch Alert scenario of SAP Solution Manager. This lets you find the current load of key system resources, as well as available buffers for future growth. Checking the Quick Sizer tool on the SAP Service Marketplace can provide an initial estimate of additional hardware requirements. Your hardware partner can then work with you to refine the actual size of all major system components in the target scenario.

In addition, SAP provides the SAP GoingLive Functional Upgrade Check service to conduct a plausibility check of the planned capacity of the target system. This may include upgrade sizing, as well as Unicode sizing.

Adapt Applications

A significant cost driver during software upgrades is custom code and modifications made to standard software. The custom development management cockpit (CDMC, see Section 8.4.4, Custom Development Management Cockpit) is the approach SAP promotes to analyze the custom
Business Continuity

2.4

code in your software landscape and to optimize upgrades to these developments.

In addition to custom developments, application adjustments need to be performed to match your solution to changed SAP standard functionality. SAP Solution Manager helps with this task by automatically presenting upgrade and delta views of the IMG for each component to be upgraded.

**Manage Parallel Changes**

It is very important to not compromise any aspect of your change-management process in the course of an upgrade. You might be tempted to allow mass exceptions to the existing set of rules. You usually have to implement many changes in a short period of time and might feel that you do not have enough time for a thorough evaluation to determine if a change is really required. However, such practices introduce a lot of risks.

You should, therefore, make the reliability of the change-management process your first priority. SAP Solution Manager provides powerful tools to implement change request management. Do not reassign roles, change the sequence, or implement new tools, if these steps are not urgently required. If this has to be done — perhaps to facilitate the upgrade — you should try to adapt the process as early as possible in the upgrade and let the new scenario be established well before the upgrade in day-to-day business.

To maintain the current production environment, we strongly recommend setting up a maintenance landscape in parallel to the project landscape for implementing corrections in the old release. During this phase, urgent corrections to the production system have to be applied twice: in the development systems of both the maintenance and upgrade landscapes (dual maintenance). To minimize project efforts for dual maintenance, you should implement a strict code-freeze period immediately after upgrading the development system.

**Convert Data**

SAP always attempts to create downward-compatible software, so that you can still execute old functions and software in the new release.
However, continuous product enhancements may require data conversions. Such conversions can mean considerable preparation and execution effort. The most prominent example is the conversion to the Unicode standard. Although this activity is technically not required to be executed with an upgrade, many upgrades to products based on SAP NetWeaver 7.0 (particularly SAP ERP 6.0) require Unicode conversion because SAP does not support more than one installed codepage in these releases. Single codepage systems do not have to convert to Unicode, but SAP’s product strategy is committed to Unicode. Therefore, a conversion cannot be avoided in the long term.

The analysis covers the following main areas of application changes:

- Checks for the existence and usability of certain customer-specific data, such as report and display variants
- Information on necessary customizing settings for new functionalities
- Starting of reports that are not part of Execution of Programs after Import (XPRA) reports (which are started automatically during the upgrade) to adjust your data to the new release

The ASU toolbox can be integrated into standard upgrade procedures through automatically generated task lists and provides all required tasks in their optimal sequence. The ASU toolbox is also integrated with upgrade project management in SAP Solution Manager to guide you through manual activities before and after the upgrade, including, for example, the direct display of related SAP Notes.

Minimize Business Downtime

For customers with extremely high system availability requirements, SAP offers the near zero downtime method. This method enables you to reduce business downtime to three or four hours for a release upgrade. Business downtime is defined as total system outage for business users,
including downtime for the technical upgrade, as well as required data conversions, the implementation of customer transports, and system validation, with sign-off by business users. More detailed process information can be found in Section 8.4.3, Solution Documentation Assistant.

**Ensure Business Continuity**

One major challenge of any upgrade project is to ensure maximum business continuity after the completion of the technical upgrade, which means making sure that the availability, stability, and performance of the software can be provided at the same level as before the upgrade. Important measures to minimize the risk and impact of business disruption include efficient testing of core business processes, sufficient training of end users, and an appropriate update of solution operation procedures.

After delta changes and adjustments have been executed, the test workbench functionality in SAP Solution Manager helps you plan, execute, and monitor your integrated testing based on your business process documentation and the delta changes you selected to be implemented (see the Section “Application Incident Management” in this chapter for more information).

The learning map builder in SAP Solution Manager helps you create role-specific learning maps based on documents generated during the upgrade project, which are relevant to end-user training.

Finally, operating procedures must be reviewed for their currentness and updated as required, and the operations staff has to be trained accordingly. This may include the following tasks:

- If new business processes, application components, or technologies are implemented in the course of a functional upgrade project, the new parts of the solution need to be integrated into the existing operations concept.
- If the hardware, operating system, or database software is being migrated to a different platform, system administration and monitoring procedures must be analyzed and updated.
If interface technologies are changed, or new interfaces are added, the interface-management concepts and handling procedures need to be reviewed and adapted to ensure performance and stability of business processes.

A revision of the general security policy is usually required.

<table>
<thead>
<tr>
<th>Relevant SAP Solution Operations Standards</th>
<th>Work Center in SAP Solution Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upgrade</td>
<td>Implementation/Upgrade</td>
</tr>
<tr>
<td>Change Management</td>
<td>Change Management</td>
</tr>
<tr>
<td>Data Volume Management</td>
<td>View Data Volume Management in the Business Process Operations work center</td>
</tr>
</tbody>
</table>

**SAP Enhancement Packages**

As of SAP Business Suite 2005, SAP bases its release strategy on optional EHPs. The concept was first available with SAP ERP 6.0; however, it is, or will be, extended to all SAP Business Suite applications and SAP NetWeaver. EHPs deliver new functionality and key innovations for SAP applications on top of a software release, eliminating the need for you to upgrade to the current release of an SAP product. EHPs include functional enhancements, industry-specific enhancements, and simplifications; they have the same maintenance duration as the underlying core application. The *switch framework* enables you to activate new business functions in an EHP when desired. Until then, the technical installation of an EHP has no impact on your existing business processes or UIs.

Through the SAP Service Marketplace, you may discover new enhancements and evaluate their business relevance for your company. The technical installation is separate from business innovation; it has no effect on any UI or existing business process.

The technical installation is supported by the maintenance optimizer and the SAP EHP installer through guided procedures. A detailed description of this procedure can be found in Section 9.4, Tools for Deploying SAP Enhancement Packages.
The main advantages of the SAP EHP installer include the following:

- Improved user experience due to an intuitive guided procedure
- Streamlined installation process
- Reduced downtime
- Easier addition of support packages
- Mitigated risk due to an isolated shadow system

SAP also offers continuous quality checks (CQCs) for upgrade projects. You will find a detailed list of available CQCs in Appendix A, Additional Information and Offerings.

### Optimize Phase: What SAP Enterprise Support Offers for You

#### Benefit Case: Built-In Protection of Investment
To protect your investment, SAP Enterprise Support offers technology upgrades (SAP support packages, SAP legal change packages) and maximal time for return on investment and deployments by the 7-2 maintenance strategy. A set of dedicated services and capabilities is available to keep planned downtimes and thereby minimize upgrade costs and risks. It also supports the virtualization of system resources and provides holistic quality management during the optimize phase, as well as overall protection of investment by innovation without upgrade.

- Benefits for customers: Up to 20% less cost of operations
- Benefits for partners: Less operation costs by SAP support, and less than 30% data growth; compliance guaranteed by SAP

#### Core Assets
Core assets of SAP Enterprise Support for the operate phase include the following:

- Maintenance optimizer
- Solution management assessment best practices
Establishing SAP Solution Manager as a Consolidated Data Source in Your Enterprise

Summary
SAP Enterprise Support provides a proactive rather than reactive approach to solution support and enables ALM. This is accomplished with integrated quality management throughout the lifecycle of solutions. The engagement goes the extra mile and covers SAP software and all horizontal and vertical IT assets and software components that are required to complete the customer’s business processes as documented in the solution documentation in SAP Solution Manager.

- Data growth management and archiving best practices
- Built-in archiving
- SAP Notes with code changes and SAP Notes Assistant
- SAP support packages, SAP legal change packages
- Technology updates
- Best practices for tuning
- 7-2 support strategy

SAP Enterprise Support Services
- SAP Enterprise Support status report review
- Modification justification check
- Modification maintainability check
- SAP CQCs (Downtime Assessment, Upgrade Assessment, GoingLive Functional Upgrade Check)
# Index

## A

<table>
<thead>
<tr>
<th>Term</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action plan</td>
<td>132, 138</td>
</tr>
<tr>
<td>Alert management</td>
<td>63, 137</td>
</tr>
<tr>
<td>Alerts</td>
<td>140</td>
</tr>
<tr>
<td>Americas’ SAP Users’ Group (ASUG)</td>
<td>290</td>
</tr>
<tr>
<td>Analysis tools</td>
<td>175</td>
</tr>
<tr>
<td>Application lifecycle</td>
<td>132</td>
</tr>
<tr>
<td>Application lifecycle management</td>
<td>35</td>
</tr>
<tr>
<td>Application management</td>
<td>36, 63, 74, 107, 111, 221</td>
</tr>
<tr>
<td>Application management lifecycle</td>
<td>44, 49, 241, 243</td>
</tr>
<tr>
<td>Application management team</td>
<td>75, 107, 136, 146</td>
</tr>
<tr>
<td>Application-specific upgrade</td>
<td>84</td>
</tr>
<tr>
<td>Application-specific upgrade toolbox</td>
<td>240</td>
</tr>
<tr>
<td>Architecture services</td>
<td>284</td>
</tr>
<tr>
<td>ASAP methodology</td>
<td>37</td>
</tr>
</tbody>
</table>

## B

<table>
<thead>
<tr>
<th>Term</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back office</td>
<td>281</td>
</tr>
<tr>
<td>Background processing</td>
<td>69</td>
</tr>
<tr>
<td>Balanced scorecard</td>
<td>278, 279</td>
</tr>
<tr>
<td>Blueprint</td>
<td>240</td>
</tr>
<tr>
<td>Build</td>
<td>241, 244</td>
</tr>
<tr>
<td>Build and test</td>
<td>36, 54, 55</td>
</tr>
<tr>
<td>Business blueprint</td>
<td>52</td>
</tr>
<tr>
<td>Business configuration</td>
<td>38, 49</td>
</tr>
<tr>
<td>Business continuity</td>
<td>39, 63, 64, 85, 91, 102, 120, 131, 134, 138, 142, 147, 207, 238</td>
</tr>
<tr>
<td>Business function</td>
<td>268</td>
</tr>
<tr>
<td>Business process</td>
<td>38, 114, 120, 131</td>
</tr>
<tr>
<td>Business process champion</td>
<td>107, 123, 124, 137, 138, 141, 157, 198, 200, 201, 213, 230, 243, 246, 255</td>
</tr>
<tr>
<td>Business process change analyzer</td>
<td>45, 164, 167, 168</td>
</tr>
<tr>
<td>Business process improvement</td>
<td>91, 102, 207, 208, 210, 212, 238, 246</td>
</tr>
<tr>
<td>Business process improvement plan</td>
<td>132</td>
</tr>
<tr>
<td>Business process integration</td>
<td>120</td>
</tr>
<tr>
<td>Business process monitoring</td>
<td>63, 68</td>
</tr>
<tr>
<td>Business process operations</td>
<td>43, 67, 107, 121, 140, 148</td>
</tr>
<tr>
<td>Business process operations team</td>
<td>136, 140</td>
</tr>
<tr>
<td>Business process repository</td>
<td>50, 243</td>
</tr>
<tr>
<td>Business process requirements</td>
<td>131, 201, 213, 232, 238</td>
</tr>
<tr>
<td>Business processes</td>
<td>140, 141, 142, 150</td>
</tr>
<tr>
<td>Business processes monitoring</td>
<td>142, 144, 146</td>
</tr>
</tbody>
</table>

## C

<table>
<thead>
<tr>
<th>Term</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA Wily Introscope</td>
<td>65</td>
</tr>
<tr>
<td>CA Wily Introscope Enterprise Manager</td>
<td>155</td>
</tr>
<tr>
<td>Certification</td>
<td>127, 316, 320</td>
</tr>
<tr>
<td>Run SAP implementation program for SAP service partners</td>
<td>317</td>
</tr>
<tr>
<td>Change analysis</td>
<td>74, 155</td>
</tr>
<tr>
<td>Change control</td>
<td>120, 122</td>
</tr>
<tr>
<td>Change impact analysis</td>
<td>168</td>
</tr>
<tr>
<td>Change management</td>
<td>56, 83, 102, 246</td>
</tr>
<tr>
<td>Change request management</td>
<td>47</td>
</tr>
<tr>
<td>Change-impact analysis</td>
<td>168</td>
</tr>
<tr>
<td>Clearing analysis</td>
<td>241</td>
</tr>
<tr>
<td>Clearing project</td>
<td>241</td>
</tr>
<tr>
<td>Code freeze</td>
<td>83</td>
</tr>
<tr>
<td>Company network</td>
<td>311</td>
</tr>
<tr>
<td>Composite application development</td>
<td>231</td>
</tr>
<tr>
<td>Continuous quality checks</td>
<td>178, 252</td>
</tr>
<tr>
<td>Core business processes</td>
<td>122, 173, 263</td>
</tr>
<tr>
<td>Cost of innovation</td>
<td>228</td>
</tr>
<tr>
<td>Critical path</td>
<td>173</td>
</tr>
</tbody>
</table>
Index

Custom code 41, 48, 55, 61, 65, 73, 75, 82, 163, 226, 231, 232, 233, 234, 247, 248
Custom code maintainability check 126, 249
Custom development 107, 141
Custom development management cockpit 82, 236, 241
Custom development team 107, 136, 141, 156, 228, 255
Custom software 226
Customer COE 99, 100, 102, 110, 117, 127, 173, 211, 219, 226, 272
Customer-specific maintenance 223

D
Data aggregation 136
Data consistency 112, 143, 144, 177
Data consistency management 69
Data conversion 83
Data integrity and transactional consistency 144
Data volume management 71, 145, 146
Deploy 36, 37, 60
Design 36, 52, 241, 244
Design operations 313
Development 229
DMAIC 94
Downtime 84, 87, 148

E
eCATT 58
EHP business function 168
End-to-end analysis 174
End-to-end solution operations 101, 102, 121, 272
Engagement architect 276
Enhancement package 207, 239
Exception analysis 74, 155, 176
Exception handling and business process and interface monitoring 142
Extended Maintenance 221

F
Front office 281

G
Go-live 61, 311
Governance 276

H
Hybrid model 258

I
Incident 135, 138
Incident management 43, 64, 72, 75, 121, 137, 245
Incremental upgrade and Unicode conversion (IUUC) 267
Innovation 86, 102, 112, 163, 207, 219, 231, 257, 260
Innovation and protection of investment 91
Integration testing 57, 118, 163
Integration validation 58, 150, 172, 173, 238, 272
Interface monitoring 68, 142, 144
Interfaces 203, 205, 227, 236, 240
Issue management 177
IT infrastructure 70, 76, 81, 121, 137, 260, 289
IT Infrastructure Library (ITIL) 36, 315
IT infrastructure team 107
IT reporting 77, 147
IT transformation 272

J
Java log viewer 155
Job chains 69
Job management 142, 143
Job scheduling management 69, 143, 149
Job sequences 142
Index

K
Key user 70, 107, 137, 144
KPI 201, 208, 211, 253

L
Legal change packages 222
Lifecycle 37, 44, 318
Lifecycle management 38, 40
Load tests 172

M
Mainstream maintenance 222
Maintenance 263
Maintenance costs 242
Maintenance management 43
Maintenance optimizer 79, 86, 239, 265
Maintenance project 48
Maintenance strategy 222, 259
Master release plan 228, 229, 256
Measurement platform 89, 90, 96
Minimum documentation 184
Modification justification check 124, 126, 248, 255

N
Near-zero downtime 267

O
Operate 36, 50, 63
Operations processes 253
Optimization 174
Optimization of business processes 199, 209
Optimize 36, 50, 78, 241
Organizational model 106
Outsourcing 109, 110, 114, 133, 134, 272
Outtasking 109, 110, 114, 133, 134, 272

P
Partner 109, 311
Performance test 57
Planning reliability 259
Problem management 72
Product availability matrix 81, 240
Program management office 107, 109, 117, 136, 228, 246, 256
Protection of investment 102, 112, 150, 207, 226, 242, 246, 251

Q
QM for accelerated innovation 112
QM for business continuity 112, 120
QM for business process improvement 112, 123
QM for protection of investment 112, 125
Quality gate 44, 45, 48, 53, 56, 58, 61
Quality management 44, 45, 59, 111, 221
Quality manager 117, 219
Quality standards 243
Quality-gate management 45
Quick Sizer 82

R
Reduce operational costs 173
Regression test 57
Release strategy 86, 225, 229
Release upgrade 260, 264
Remote connection 293
Remote supportability 76
Requirements 36, 50
Root cause analysis 59, 72, 73, 75, 76, 77, 120, 121, 134, 135, 146, 147, 155
Run SAP 46, 101, 103
Run SAP Implementation Partner Initiative Guide 317
Run SAP Implementation Program 311
Run SAP methodology 121, 132, 134, 159, 311
Run SAP roadmap 46, 312
Assessment and scoping 313
Handover into production 314
Operation and optimization 315

S
SAP Active Global Support 273
SAP Business Process Performance Optimization 251
SAP Business Suite 86, 207, 259, 260
SAP CCC 110
SAP Central Process Scheduling by Redwood 143
SAP Downtime Assessment 252
SAP EarlyWatch Alert 61, 77, 123, 147
SAP EarlyWatch Check 61
SAP ECC 6.0 261
SAP enhancement package 86, 100, 106, 126, 173, 229, 260, 262, 263, 264, 265
SAP enhancement package installer 86, 265, 266, 267
SAP Enterprise Support 35, 178
SAP global support backbone 20, 294
SAP GoingLive Check 61
SAP GoingLive Functional Upgrade Check 82
SAP master guide 82
SAP MaxAttention 271
SAP NetWeaver 63, 86, 139, 155, 237
SAP NetWeaver BW 77, 147
SAP NetWeaver Composition Environment 75
SAP Notes 294
SAP Partner 76
SAP R/3 4.6C 259
SAP R/3 Enterprise 259
SAP Safeguarding 271, 272, 282
SAP Safeguarding for Integration Validation 117, 119, 120, 173, 182, 274
SAP Safeguarding for Operations 274
SAP Safeguarding for Upgrade 274
SAP Service Marketplace 86, 264
SAP service partner 316
SAP Solution Management Assessment 123, 124, 198, 200
SAP Solution Manager 35, 37, 38, 46, 47, 51, 52, 55, 60, 63, 65, 72, 74, 76, 77, 78, 82, 83, 90, 100, 109, 118, 120, 135, 140, 141, 146, 154, 173, 184, 201, 202, 211, 236, 238, 243, 282, 316
Basic configuration 47
SAP Solution Manager installation guide 47
SAP Solution Manager master guide 46
SAP Solution Transition Assessment 237, 247
SAP standards for solution operations 110, 137
SAP Support package 79, 87, 173, 222, 228, 230, 239, 241, 260
SAP technical operations team 107, 135, 136, 139
SAP Upgrade Assessment 251
SAP upgrade guides 82
SAP Upgrade Road Map 240
Secure area 294
Security 287
Service desk 61, 72, 74, 110, 113, 239, 245, 292
Bidirectional interface 245
Service desk message 72, 137, 292
Service plan 278, 281, 283
Service-level reporting 135
Single point of contact 20, 294
Single source of truth 102, 112, 113, 141, 150
Situation report 92
Situation room 102, 114, 115, 116, 135, 137
Six Sigma 94
SOA 63, 100, 132, 231, 258, 317
Solution architect 276
Solution directory 39
Solution documentation 133
Solution documentation assistant 240
Solution documentation for custom development 243
Solution implementation 54
Solution Manager project 37, 39
Solution monitoring 64, 73
Solution operations 210, 236
Solution operations standards 133
Standards for solution operations 109, 318
Support advisory center 19
Support services 183
Sustainability 287
Switch framework 126, 263, 264, 268
Switch framework cockpit 268
System administration 67, 120, 122, 140
System landscape optimization services 284
System monitoring 64, 73, 139, 146

T

Technical analysis 174, 175
Technical integration validation 117, 118, 172, 173
Technical operations 43, 64, 121, 122, 148
Technical quality manager 276, 281
Technology updates 222
Test documentation 172
Test management 42, 45, 55, 56, 164
Test organizer 55
Test package 57
Test plan 57, 170
Test project preparation 166
Test scope identification 167
Test strategy 165
Test workbench 177, 240
Thread dump analyzer 155
Top issue 115, 118, 132
Total cost of operation 91
Trace analysis 74, 119, 155, 176, 177
Training 320
Transactional consistency 114
Transactional correctness 143
Transparency 116
Transport management 56
Trend analysis 142

U

Unicode 82, 84
Upgrade 43, 80, 82, 83, 85, 163, 164, 226, 238, 239, 241, 242, 251, 267
Upgrade costs 229
Upgrade dependency analyzer 81, 242
Upgrade/change impact analysis 241
User-acceptance test 57

V

Verification 174, 178

W

Work center 53, 72, 139, 146
Workload analysis 74, 155