RAK Government

Public Services Department, Finance Department, &

Electronic Government Authority

Response to Request for Proposal For

S4HANA Implementation

Edraky LLC.

19th of February, 2020

Dear Sir,

We are pleased to present RAK PSD with this proposal to implement SAP solution. Our proposed solution includes implementation services for SAP Solution.

We fully recognize the importance of having a solid software platform to support the effectiveness of your operations, and build the success of your enterprise. SAP is proposing a functionally complete set of applications to accommodate the scope of your project.

We are confident that Edraky is the right choice for RAK PSD given our knowledge of your needs and objectives; we know that SAP is a clear and compelling solution that will deliver quantifiable and actionable value to RAK PSD.

We are looking forward to working with you to make your initiative a successful deployment on time, value, and budget and to becoming your long-term partner of choice.

Sincerely,

Edraky Presales Department

Confidentiality Statement

The content of this document shall remain confidential property of Edraky and may not be communicated to any other party without prior written approval of Edraky. This document must not be reproduced in whole or in part. It must not be used other than for evaluation purposes only by RAK PSD except with the prior written consent of Edraky and then only on condition that Edraky and any other copyright notices are included in such reproduction. No information as to the contents or subject matter of this proposal or any part shall be given or communicated in any manner whatsoever to any third party without the prior written consent of Edraky.

Edraky warrants that to the best of its knowledge, that this proposal has taken all reasonable care in preparing it and believe its contents to be true as of the date of this document.

Any services to be provided by Edraky as proposed in this document shall be subject to the standard terms and conditions of Edraky for the provision of the relevant services.

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1. Executive Summary

Edraky is pleased to present RAK PSD this proposal of professional services for the implementation of SAP ERP. This proposal is prepared based upon our intent to provide RAK PSD with the consulting expertise required to implement SAP solution successfully in a cost-efficient manner.

It is our understanding that RAK PSD requested this proposal from Edraky for a better understanding and documentation of the services that can be provided to assist in achieving its overall objectives. The scope definition is based on our scoping session and conference calls that took place.

By implementing the solution, RAK PSD gets an IT platform, which supports the business in achieving following objectives:

- Keep pace with quickly changing market conditions and customer demands
- Streamline business operations
- Comply with financial reporting requirements
- Broaden and deepen your insight into business operations
- Improve financial management - Accelerate financial closes, increase the accuracy of financial reporting, and maintain superior cash management.
- Maintain operational excellence - Improve efficiency and effectiveness by streamlining business processes, enhancing service levels, and cutting costs and errors.
- Enhance agility - respond more quickly to change, enhance customer experiences, and differentiate your company from your competitors.
- Drive adoption and improve productivity – Promote quick adoption and increase productivity with an intuitive, single desktop environment. RAK PSD functionality eliminates the need for manual data re-entry between systems, saving time and reducing the risk of mistakes.

Solution Overview

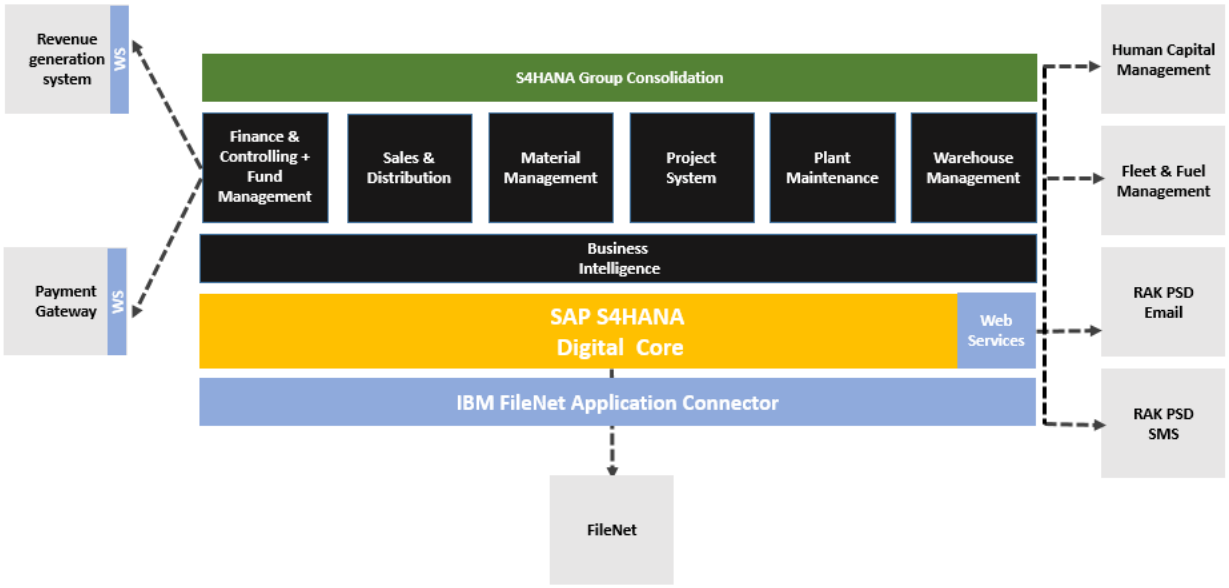
SAP solution is a powerful application, built to enrich and improve businesses and lives through its specific purpose. They are optimized to integrate, learn, and improve themselves in a way that goes beyond basic software and database solutions. This way, SAP aim to fulfill our strategic purpose of helping the world run better and improving people's lives.

The following list of solutions is proposed based on **S4HANA Implementation Project for PSD** RFP document. Our consultants have taken into consideration the current complexity of the existent landscape of RAK PSD organization.

Scope Overview

- SAP S4HANA Finance & Controlling
- SAP Fund Management
- SAP S4HANA Material Management
- SAP S4HANA Sales & Distribution
- SAP S4HANA Project System
- SAP S4HANA Warehouse Management
- SAP S4HANA Plant Maintenance
- SAP S4HANA Group Consolidation
- SAP Business Intelligence

Solution Architecture



- Integration Middleware/ Tool
- Existing RAK PSD Application Name
- SAP Core Modules – Phase I
- SAP Module – Phase II
- SAP Platform – Digital Core

2. Edraky Company Profile

2.1 Edraky Overview

Edraky is a regional Information Technology company established on Jan 2010 based on more than 20+ years of business and Information Engineering experience producing integrated business solutions for many industries like Trade, Professional Services, Automotive and many other enterprise support functions like Finance, HR, Supply Chain, CRM, Sales and Distribution.

Serving both local and international markets, Edraky Associates brings a fresh and innovative approach to consulting services, acting as liaison between the Business-users and the Technologies.

Our goal is to exceed the expectations of every client by offering outstanding customer service, increased flexibility, and greater value, thus optimizing system functionality and improving operation efficiency.

Our team members are distinguished by their functional and technical experience combined with their hands-on experience, thereby ensuring that our clients receive the most effective and professional service.

According to the above focus, Edraky is involved in every stage upon client selection of SAP ERP System from implementation to completion offering continual functional and technical support. Our extensive skills encompass all aspects of implementation and operation, including business requirements definition, development of functional specifications for client approval, Setup, and overseeing development teams customizing software to fit specific client needs. Typically, we are on-site at the client's locations handling contact, providing functional and technical training and support, and resolving any and all troubleshooting issues in the post go-live environment.

We pride ourselves on our proven record of accomplishment for effectively delivering multiple implementations. Our Partnership with SAP entitles Edraky to further extend its services portfolio to cover the following:

- Value added Re-seller (VAR)
- Implementation Services
- SAP System Integration
- Process Management
- SAP Managed Services

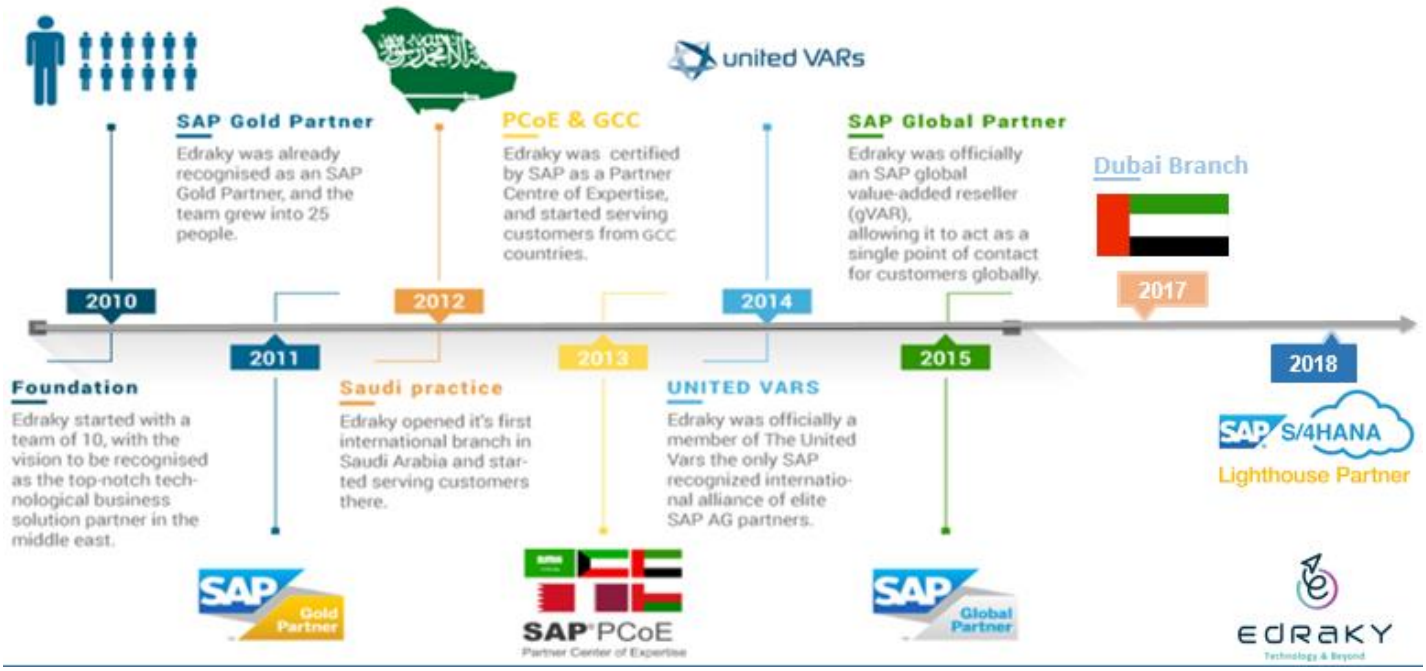
SAP License & Implementation

SAP Support

Management Consulting

Building upon years of experience in IT Industry and equipped with tools to manage the entire project lifecycle Edraky is geared to hit new levels in Implementation services delivery standards that are aligned to international standards.

2.2 Edraky at a Glance



2.3 Edraky Partnerships

2.4 Edraky Locations

Egypt

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United Arab Emirates

Dubai Silicon Oasis **("DSO").**

Office B403 – 1, Headquarters, Dubai Silicon Oasis, Dubai.

Qatar

Barwa Tower 1, 6th Floor Suhaim Ben Hamad Street, C-Ring Road, Al Sadd –Doha

+(974) 40329148 , + (974)74488945

3. Proposed Solution

3.1SAP S4/HANA Finance & Controlling (FICO)

3.1.1. Accounting and Financial Close

The central task of General Ledger accounting is to provide a comprehensive picture of external accounting and accounts. By recording all business transactions - primary postings and settlements from internal accounting - in a software system that is fully RAK PSD with all the other operational areas of a company, you ensure that the accounting data is always complete and accurate.

General Ledger Accounting serves as a complete record of all business transactions providing a centralized, up-to-date reference for the rendering of accounts. Actual individual transactions can be checked at any time in real-time processing by displaying the original documents, line items, and transaction figures at various levels (such as account information, journals, totals, transaction figures, and balance sheet).

This process covers all required period end-closing steps, related to do local period-end closing and steps that are identical for local and parallel ledger.

Business Benefits

Recording all business transactions ensures complete and accurate accounting data.

Key Process Flows

- Post general ledger account documents
- Display the document journal
- Display G/L balances (list)
- Carry out recurring entries
- Maintain accounts: Automatic and manual clearing
- Perform day-end closing
- Perform month-end closing
- Perform year-end closing

3.1.2. Accounts Payable

With Accounts Payables, you can manage your open payables invoices that are automatically created from purchasing processes. You can manage and control open items with various analytical tools to optimize accounts payable handling. You can process payments automatically, ensure approval of all payments before payment, and monitor payment progress.

Business Benefits

- Accounts payable are an integral part of the purchasing system

- Accounts payable postings are recorded directly in the general ledger
- Payment program can automatically create instructions for bank transfers
- You can use workflow for payment approval
- You can use simplified and secure connectivity for transacting with multiple financial institutes

Key Process Flows

- Manage and complete supplier master data
- Create invoice from logistics
- Pay invoice
- Approve payments (optional)

3.1.3. Accounts Receivable

With Accounts Receivables, you can manage your open receivables invoices that are automatically created from sales processes. You can manage and control open items with various analytical tools to optimize accounts receivables handling. Incoming payments are automatically reconciled with open invoices. Easy-to-use screens make the post processing of open items easy and efficient.

Business Benefits

- Accounts Receivable is an integral part of sales management
- Accounts Receivable postings are recorded directly in the General Ledger

Key Process Flows

- Manage and complete customer master data
- Create invoices from logistics
- Automatically reconcile open invoices with incoming payments
- Process unassigned incoming payments to open invoices easily and efficiently

3.1.4. New Asset Accounting

New Asset accounting is a subsidiary ledger of the general ledger and is used to manage and document fixed asset transactions in detail. In general ledger accounting, you can update depreciation and changes to asset balance sheet values in asset accounting. You can also make various account assignments to cost accounting for these transactions. Because of the integration in SAP ERP, New Asset Accounting (FI-NAA) transfers data directly to and from other SAP ERP components.

Business Benefits

- Transparent view of asset acquisition
- Automated, efficient processing
- Calculation of values for depreciation

- Depreciation forecast

Key Process Flows

- Create asset master
- Acquire assets
- Retire assets
- Valuate assets
- Perform month-end closing
- Perform year-end closing

3.1.5. Asset under Construction

Assets under Construction (AuC) are a special form of tangible assets. They are usually displayed as a separate balance sheet item, requiring separate account determination and their own asset classes. During the construction phase of an asset, all actual postings are assigned to the AuC. Once the asset is completed, a transfer is made to the final fixed asset.

Investment orders are used to capture the costs of AuC during the construction phase. Once the AuC is completed, the final asset is created in the appropriate asset class, and the investment order is set to complete. The next settlement transfers the AuC asset value to the completed asset.

Business Benefits

- Transparent view of an asset acquisition
- Automated efficient processing

Key Process Flows

- Assets under Construction (AuC) are a special form of tangible asset. The AuC process includes an invoice and the final settlement.
- Create investment order
- Release investment order
- Post invoice to investment order
- Monitor order progress
- Settle asset under construction
- Create assets for complete AuC settlement
- Maintain settlement rule for final settlement
- Perform final settlement of the investment order (collective processing)
- Complete investment order

3.1.6. Cash and Liquidity Management

To preside over the cash assets of a company, cash managers need to closely monitor cash positions, centrally manage banks and bank accounts, and regularly forecast the liquidity trends of the organization.

Key features:

- Cash Positions

You can use this feature to check the actual and forecasted cash positions to assist cash allocation decision-making.

- Banks and House Banks

You can use this feature to display, create, and change data about the banks that your company, your customers, and your suppliers use to transact business.

- Bank Account Master Data

You can use this feature to centrally manage the master data of your company's corporate or business bank accounts, as well as house bank accounts.

- Liquidity Forecast

You can use this feature to forecast the future liquidity trend.

- Memo Record

You can use this feature to create memo records manually and edit memo rec

3.1.7. Credit Management

The credit worthiness and payment behavior of your business partners has an immediate effect on the business results of your company.

Efficient receivables and credit management reduces the risk of financial losses and helps you to optimize business relationships with your business partners. SAP Credit Management supports your company in making early determination of the risk of losses on receivables from your business partners and in efficiently making credit decisions.

SAP Credit Management checks the exposure against the current credit limit for the business partner. In addition, you can also perform other checks, such as oldest open item, maximum dunning level, or last payment. If the new order is blocked the blocked order can be released or rejected by authorized staff.

Business Benefits

- Reduce risk of bad debt
- Focus on reliable and profitable customers
- Check credit-worthiness quickly
- Accelerate the process of checking a customer credit limit

Key Process Flows

- Enter credit limit for new customers
- Edit credit limit for existing customers
- Enter sales order
- Check exposure against credit limit
- Manage blocked orders

3.1.8. Bank Account Management

With Bank Account Management, cash managers and bank accountants can centralize the management of bank accounts using bank account master data, a table view of banks and bank accounts, workflow processes (for opening, changing or closing bank accounts), and workflow processes for periodic review of master data.

Business Benefits

- Manage bank account master data, approval process, and yearly review process centrally
- Upload and download bank accounts free

Key Process Flows

- Create bank account
- Change bank account
- Close bank account
- Maintain signatory in multiple bank accounts
- Review bank account yearly
- View bank account reports and fact sheets

3.1.9. Internal Order Planning

Various internal projects consume resources and incur costs or expenses. These projects are usually undertaken for future development of products. The costs of these projects must be tracked for various purposes such as cost control, return on investment calculations, tax reporting. Business Planning & Consolidation (BPC) provide a consistent view of the planning process. From the UI perspective, all planning applications can be accessed by a Microsoft Excel front-end to provide a homogeneous look and feel.

Business Benefits

- Comparison of planned and actual costs on internal orders
- Planning of data in spreadsheet

Key Process Flows

- Cost element planning on internal orders
- Settlement of internal orders (planned costs)

3.1.10. Internal Order – Actual

Various internal projects consume resources and incur costs or expenses, usually when developing future products. The product lines are generally determinable for such projects. The costs of these projects must be tracked for various purposes such as cost control, return on investment calculations, tax reporting, and so on. This process uses SAP's internal order functionality to track costs and status.

For every R&D project undertaken, an internal order is created using the R&D order type. Cost planning is performed on this order. When the project is approved, the order is released. Costs incurred for the project are posted on the order. Periodically, the costs collected on the order are settled to the assigned R&D cost center or to CO-PA (if CO-PA is activated). When the project is complete, and fully settled, the order is closed by setting the appropriate status.

For marketing projects, an internal order is created using the marketing order type. Marketing orders are created as statistical orders. Costs are posted to the assigned cost center and as statistical costs to the internal order. The order does not need settlement since the real costs are assigned to the cost center. For other overhead projects, you can create internal orders by using the overhead order type. In this case, a responsible cost center is assigned and internal orders are settled to this cost center.

Business Benefits

- Tracking of planned and actual costs of these projects for cost control, return on investment calculations, tax reporting, and so on
- Transparent view of outstanding orders, cost plan, and actual

Key Process Flows

- Create internal orders
- Consumable purchasing
- Post goods issues to R&D internal order
- Post general ledger account documents
- Settle internal orders (actual costs)

3.1.11. Profitability and Cost Analysis

Profitability Analysis enables you to evaluate market segments. This action can be classified according to products, customers, orders, or any combination of these, or strategic business units, such as sales organizations or profitability segments with respect to your company's profit or contribution margin.

After running assessments, the application includes several reports to analyze the data including Market Segment Report and Profit Center analysis.

Business Benefits

- Measure your profit margin by market segments

- Compare business results with planned figures

Key Process Flows

- Generation of settlement rules
- Actual assessment to CO-PA
- Data collection for summarization hierarchy (reporting)
- Run actual assessments of all cost center costs to profitability analysis (CO-PA)
- Run profitability reports

3.1.12. Overhead Cost Accounting

This scope item covers transaction-based actual postings that are normally used in overhead cost controlling. It describes entering and posting a G/L document with reference to a cost center.

Cost center accounting takes the costs incurred in a company and allocates them to the actual subareas that caused them. During period-end closing, these costs are distributed to the cost centers through automatic allocation. By allocating the cost elements to cost centers in overhead cost controlling, you can control your costs and compare plan and actual costs. The plan/actual comparison at the end of the period helps you to plan, control, and monitor cost behavior. It also supports various analyses of variances, such as volume variance, price variance, input variance, and quantity variance.

Business Benefits

- Transparent view for an account of a cost center
- Processing of a G/L document for various purposes
- Availability of steps required for preparing periodic and year end activities
- Necessary steps for preparation of periodic and year end activities

Key Process Flows

- For primary costs, the related cost center is posted
- Cost center update with the correct values
- Posting of statistical key figures
- Allocation of primary and secondary costs using an assessment cost element
- Maintaining the controlling version would need a self-configuration UI
- Comparison between actual and planned costs for the cost center
- Perform cost planning for various cost elements for cost centers
- Assess shared expenses
- Record statistical key figures
- Analyze planned and actual figures

3.1.13. Period End Closing – Maintenance Order

This scope item supports activities required for the Preventive Maintenance (BJ2) and Corrective Maintenance (BH1) scope items. Once the cost is recorded on the YBA1 - Maintenance Order and YBA2 - Preventive Maintenance order types, this scope item is executed as a follow up for Settlement, Closing and Reporting.

Business Benefits

- Fast period end closing process
- Efficient reporting

Key Process Flows

- Settlement of maintenance orders
- Close of completed maintenance orders
- Analysis of orders

3.1.14. Fund Management

The functions in this component support you in creating and executing budgets. The purpose of Funds Management is to budget all revenues and expenditures for individual areas of responsibility, to control future funds transactions in accordance with the distributed budget, and to stop the budget being exceeded. You can adapt the budget to changes in conditions by entering releases, supplements, returns, and transfer

Business Benefits

- Control revenues and expenditures and thus control the funding of business transactions of an organization.
- Closely control your budget, with the following questions in mind:
    - What funds will the areas of responsibility receive?
    - Where do these funds come from (source of funds)?
    - What are the funds used for? (use of funds)
- Control the finances of your organization by comparing commitment and actual values with current budget values.

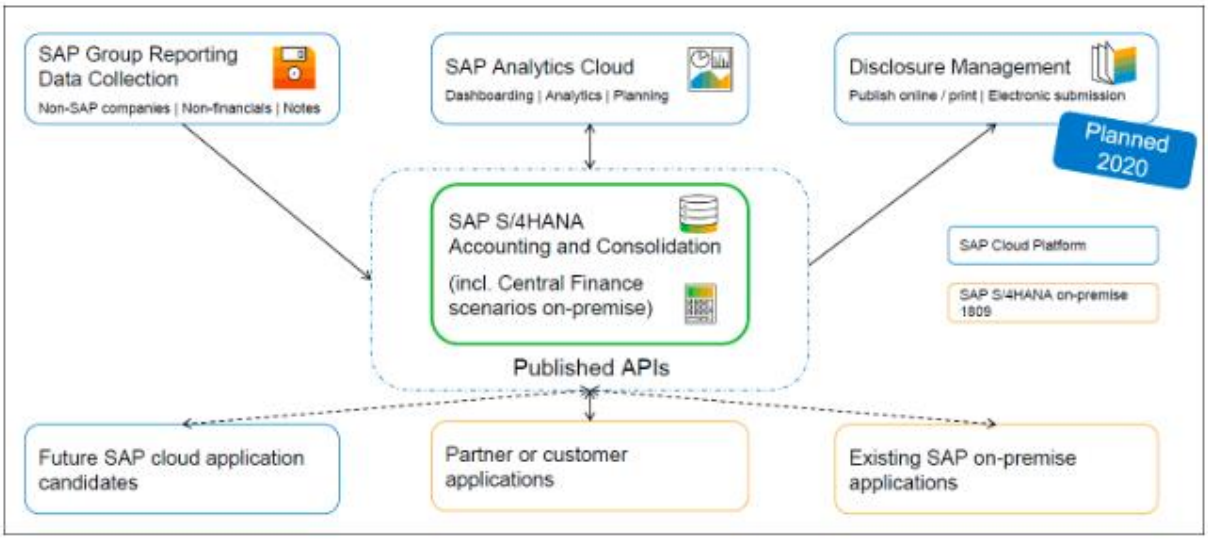
Key Process Flows

- Budget entry and approval
- Derivation of funds centers, commitment items and funded programs
- Budget availability check
- Budget supplement, return and transfers

3.1.15. Group Consolidation

SAP S/4HANA for Group reporting is SAP's strategic consolidation solution moving forward, in particular for customers implementing SAP S/4HANA irrespective of deployment option (cloud or on premise) as well as for customers looking for a public cloud stand-alone offering. Group reporting can be used independently from operational accounting or other ERP functions in SAP S/4HANA if desired.

The picture below taken from SAP's presentation on product vision, explains how Group Reporting fits into the landscape.



Business benefits

- Process monitor to track and control the consolidation process and the monthly closing.
- Eliminations based on the known business rules from SAP BPC.
- Direct real-time integration with the universal journal table of SAP S/4HANA

Key features

1- Local and Group Close in the same tool
2- Flexible rules for Data Validation
3- Currency Translation
4- Inter-Unit Elimination
5- Consolidation of Investments
6- Data Collection options – Release from Universal Journal, Flexible Upload of Reported Financial Data, or Published APIs from Other SAP or Customer applications.
7- Possibility to perform Data entry at desired level within the consolidation system.

8- Record Ownership information using Journal entries on Statistical items.
9- Manual Top-up Adjustment for Elimination where ever needed

3.1.16. Localization

VAT

VAT is based on the value addition to the goods, and your VAT liability is calculated by deducting input tax credit from tax collected on sales during the payment period.

Business Benefits

- Automatic Calculation of Company's VAT with each Purchase & Sales Transaction.

Key Process Flows

- With each Purchase & Sales Transaction, VAT Gets calculated Automatically.
- Automatic VAT Posting to Separate GL accounts Depending on the Tax Codes.

3.2 SAP S4/HANA Sales & Distribution (SD)

3.2.1 Sales Inquiry

Purpose

This scope item describes the process for a standard sales inquiry. It allows you to create, edit, and reject an inquiry. You can then create a quotation or sales order based on the inquiry.

Process Flow

- Create Sales Inquiry
- Change Sales Inquiry
- Reject Sales Inquiry

Business Benefits

- Collect data on what your customers request about your products and services
- Determine reasons for inquiry rejection
- Improve your products and services

3.2.2 Sales Quotation

Purpose

The process starts when a request for quotation (RFQ) is received from a customer. A quotation is then created in the system. After that, the customer can either accept or reject the quotation.

Process Flow

- Create quotation
- Send quotation to custom

Business Benefits

- Assure your business partners that you will deliver a certain product configuration and quantity at a specific time and price
- During sales order processing, the sales employee can use a variety of sales functions and special quotation functions

3.2.3 Sales Contract Management

Purpose

The quantity contract contains basic quantity and price information. In this scope item, the internal sales representative creates a sales quantity contract for a certain product. The internal sales representative creates a follow-up order referring to this sales quantity contract. After that, the internal sales representative checks the sales contract list filtered by a certain sold-to-party.

A value contract is a legal agreement with a customer that contains the materials and services that the customer receives within a specified time period, and for a value up to a specified target value. In this scope item, the internal sales representative creates a sales value contract for a certain product and then creates and releases a sales order against the value contract. After this, the internal sales representative checks the sales contract list filtered by a certain sold-to-party.

Process Flow

- Post goods receipt
- Create quantity contract or create value contract
- Create sales order with reference to contract
- List Sales Contracts

Key Point

- The use of quantity and value contracts provides secure planning: the customer can only call off the quantity or value for a certain price that is defined in the quantity or value contract
- The document flow provides a detailed monitoring of contract call offs

3.2.4 Sale of Service

Purpose

A service product is used in the sales order. It allows the sales of services without delivery and direct (order-related) billing.

Key Process Flow

- Create sales inquiry
- Create sales quotation
- Create sales order – including a service item (Material Type: SERV)
- Manage credit – set customer credit/Review of blocked sales orders
- Bill service items

3.2.5 Sales Order Processing with Free of Charge Delivery

Purpose

A unique sales order type is created that is not billing relevant. The order is confirmed based on the availability of goods. A delivery is created. The goods are then picked, confirmed, and delivered to the customer.

Process Flow

- Create sales order with free of charge items
- Execute picking post goods issue
- Execute picking
- Post goods issue

Business Benefits

- System integrated Free of Charge sales order processing

3.2.6 Sales Order Processing Using Third Party

Purpose

In third-party order processing, your company does not deliver the items requested by a customer. Instead, you pass the order along to a third-party vendor who then ships the goods directly to the customer and bills you. The standard sales order automatically creates a purchase requisition for the materials to be delivered by the third-party vendor. The incoming invoice from the vendor updates the billing quantity, so that the customer billing document can only be created after entering the invoice from the vendor.

Process Flow

- Create third-party sales order
- Convert purchase requisition to purchase order
- Approve purchase order

- Enter vendor invoice
- Create billing document

Business Benefits

- Reduce stock and cost, increasing efficiency
- Hand over customer's requirements directly to external supplier
- Base invoice from trader to customer on quantities from supplier invoice
- Fulfill customer's requirements despite material shortage

3.2.7 Sales Order Processing with Collective Billing

Purpose

This scope item describes how to use the standard sales processing (sell-from-stock) for mass processing. The process starts with the creation of several standard sales orders. In periodic intervals, all sales orders due to deliver and with material availability are selected and deliveries are created. For optimization of shipping costs, all sales orders that are delivered to the same customer are packed into one delivery document.

For Lean Warehouse Management storage locations, Warehouse Management transport orders and picking documents are automatically created. The materials are picked and the actual amount of picking is noticed in the delivery. In the next step, goods issues are posted and the materials can leave the warehouse. At periodic intervals, all deliveries are selected for billing. For cost optimization, all deliveries due to invoice to the same customer are packed into one invoice document. The revenue is posted to accounting

Process Flow

- Create sales order
- Create delivery
- Execute picking
- Post goods issue
- Create billing document

3.2.8 Sell from Stock

Purpose

The process starts with the creation of a customer and standard sales order. Depending on the customer and the material, various special events take place during order entry, such as customer or material pricing.

If enough material exists in the required storage location, the process proceeds normally. If not, a stock movement takes place. Picking slips are generated to stage the product for shipment to

the customer. Once picked, the physically shipped quantity must be registered in the system to ensure that there are no differences between the sales order and the delivery document.

After the completion of picking, the shipping specialist relieves the inventory. This inventory relief is the actual recording of the physical quantity that is being shipped to the customer. The cost of goods sold is recorded in financial accounting.

Once the inventory is relieved, you can invoice the delivery and record the revenue and the cost of goods sold in management accounting.

Process Flow

- Create sales order
- Print order confirmation
- Create delivery
- Execute picking
- Post goods issue
- Create billing document

Business Benefits

- When an order is entered, an availability check is performed and a shipping point is determined automatically
- A billing document is created
- Postings to FI and CO are made

3.2.9 Customer Returns

Purpose

The process starts with a customer request for authorization to return materials to the plant for credit, referred to as a Return Material Authorization (RMA). The request is approved, and a return sales order is created with reference to the original invoice for the goods. An RMA document is printed and forwarded to the customer to be attached to the incoming goods. The goods are shipped back, a return delivery is created with reference to the RMA, and the material is received into return stock.

The return stock location is set to be non-MRP relevant. The goods are inspected, resulting in a disposition to either return them to stock, or scrap. A credit memo is created from the billing run and posted to the customer's account.

Process Flow

- Create sales order
- Create return delivery

- Create billing document

Business Benefits

- System integrated processing of customers returns and complaints

3.2.10 Credit Memo Processing

Purpose

A credit memo request is created with the amount to be credited, and placed on a billing block for review. The amount to be credited is calculated as difference between the original amount and the correct amount entered manually in the credit memo request. It must then be released to become billing relevant and appear on the billing due list. From there the credit memo can be created manually or alternatively the periodic billing process creates a credit memo to be sent to the customer, and posts an accounting document.

Process Flow

- Create credit memo request
- Remove billing block (review credit memo request)
- Create credit memo

Business Benefits

- System integrated credit memo processing

3.2.11 Debit Memo Processing

Purpose

A debit memo request is created with the amount to be debited, and placed on a billing block for review. The amount to be debited is calculated as difference between the original amount and the correct amount which is entered manually into the debit memo request. It is then released to become billing relevant and appear on the billing due list. From there the credit memo can be created manually or alternatively. The periodic billing process creates a debit memo to be sent to the customer, and posts an accounting document.

Process Flow

- Create debit memo request
- Remove billing block (review debit memo request)
- Create debit memo

Business Benefits

- System integrated debit memo processing

3.2.12 Cross Company Sales

Purpose

When There is lack of inventory, or special sales and shipments management instruction have been given, a company can sell the goods to its customer from its peer company inventory which is under the same company group. The peer company picks the goods up and ships it to the end customer from its shipping points. The selling company issues the invoice to customer once shipment is done. When the shipment is received, the peer company creates an invoice to selling company based on internal sales price & creates an AR.

Process Flow

- To increase customer order fulfillment rate as long as goods is available within the same corporation group.
- Deliberately remove excess stock of peer company
- Improve the overall sales operation efficiency of the company group by moving more sales to this sales organization.

3.2.13 Outbound Delivery

With the availability of material or transport scheduling date, outbound delivery is required for due shipping lines. It involves shipping activities like picking of goods, transportation scheduling, etc. An outbound delivery is done with the shipping points and is determined at the time of placing the order. You can also define a shipping point manually at a later stage.

Process Flow

- To check the material and order to ensure if the outbound delivery of goods is possible.
- Defining the quantity of goods and its availability.
- Packing the outbound delivery.
- Calculating weight or volume of delivery.
- Find out the delivery situation and the delivery agreement.
- Defining the route.
- Finding the pickup location.
- Updating and changing the status of the sales order.

3.2.14 Proof of Delivery

Proof of Delivery (POD) is a process used by some businesses which a customer invoice is created only after the customer confirmation received on the delivery receipt at their warehouse. In addition to that; system allows recording the POD Date, time and the actual quantity of goods that has been arrived. If there is a difference between quantity of goods issued and quantity of goods arrived, then possible reason for that difference.

Some practical world reasons for above mentioned stock shortage can be theft, stock shrinkage, transportation damage, etc. This is very useful when negotiating with the forwarding agent as all possible deviations is reflected within SAP.

Based on the customer confirmed quantity (Received quantity at customer's warehouse), now it is possible to create an accurate invoice in SAP.

3.2.15 Sales Order Processing with Collective Billing

Purpose

This scope item describes how to use the standard sales processing (sell-from-stock) for mass processing. The process starts with the creation of several standard sales orders. In periodic intervals, all sales orders due to deliver and with material availability are selected and deliveries are created. For optimization of shipping costs, all sales orders that are delivered to the same customer are packed into one delivery document.

For Lean Warehouse Management storage locations, Warehouse Management transport orders and picking documents are automatically created. The materials are picked and the actual amount of picking is noticed in the delivery. In the next step, goods issues are posted and the materials can leave the warehouse. At periodic intervals, all deliveries are selected for billing. For cost optimization, all deliveries due to invoice to the same customer are packed into one invoice document. The revenue is posted to accounting

Process Flow

- Create sales order
- Create delivery
- Execute picking
- Post goods issue
- Create billing document

3.2.16 Sales Order Processing with Customer Down Payment

Purpose

In this process, you create requests for down payment, record the receipt of the down payment, and create a final invoice after the deduction of the received down payment and a receipt of the

final amount due on the invoice. The process uses the billing plan functionality in Sales and Distribution. The integrated process allows maintenance of proper document flow between the sales and financial transactions.

Process Flow

- Create sales order and assign billing plan
- Remove billing block
- Create billing document
- Post down payment
- Create delivery
- Execute picking
- Post goods issue
- Create billing document and down payment clearing

Business Benefits

- System integrated sales order processing with customer down payment

3.2.17 Billing & Invoicing

In SAP Sales and Distribution module, billing is known as the final stage for executing business transactions. When an order is processed and delivery is made, billing information is available at each stage of this order processing.

Billing contains the following components −

- Credit and Debit memos for return goods.
- Invoice creation for delivery and services.
- Cancel Billing transactions.
- Pricing Functions.
- Discount and Rebates.
- Transferring billing data to Financial Accounting FI.

Billing is closely integrated with organization structure and it can be assigned to Sales Organization, a Distribution Channel, and a division.

Key functions

- Types of Billing
- Match codes
- Number Range

- Blocking Reasons
- Display billing list
- Display billing due list

Billing Document Types

A billing document is created for a credit memo, debit memo, an invoice or a cancelled transaction. Each billing document has a header and list of items under it. Billing documents are normally controlled by the billing type.

In a billing document header, it contains general data like:

- Date of Billing
- Payer identification number
- Billing value
- Currency
- Partner Identification numbers like ship to party, sold to party, etc.
- Pricing Elements

In the list of items, you should maintain the following data:

- Material Number
- Quantity of goods
- Volume and weight
- Value of Individual items
- Pricing element for individual items

While doing the billing processing, you create, change and delete the billing documents like – invoices, credit memos, debit memos, etc.

Billing Processing also includes creation of billing documents as per the below reference –

- To a sales order
- To a delivery
- To external transactions

You can refer to an entire document, individual items or partial quantities of items.

A Billing document can be created in the following ways –

- When a system processes a billing due list automatically as a background task.
- By manually processing from a worklist.

- You can also create a billing document explicitly

Billing Methods

A billing method determines whether you have to create an invoice for every delivery or you want to send an invoice to the customer each month.

Billing method types:

- Individual Billing per sales document.
- Collective Billing method for multiple sales document.
- Invoice Split for several billing documents for one or more sales document.

In Individual Billing method, you can make the setting in system to create single billing document for each sales document. Example: One invoice per delivery.

In Collective Billing, it allows you to combine different documents like sales orders and/or deliveries either partially or fully in a common billing document.

Invoice Splits allow you to create invoices as per the specific criteria.

Billing Plan

A billing plan in SAP SD is defined as a plan with individual billing dates for goods and services and it doesn't depend on the delivery of goods. Using this bill plan, you can bill for a service or product at regular time intervals or at specific dates defined in the system in advance.

Types of billing plan

- Milestone Billing
- Periodic Billing

Milestone billing includes dividing the total billed amount in multiple billing dates that are defined in a billing plan. When there is a milestone reached as per defined in the system, customer is charged as per the project cost or a predefined amount as per the bill plan. Milestone billing is normally used for long term projects.

Periodic billing includes charging of bill amount at a regular interval of time. Example: Suppose you have to pay a rental amount monthly as per the contract. The system can process monthly payment as per the schedule. Periodic billing plan is normally used in the following categories:

- For a Service like Annual Maintenance contracts, etc.
- For lease agreements.
- Intellectual Property Management.

3.2.18 Bill of Services

Purpose

Bills of services play an important and central role for numerous business processes in the building industry, plant engineering and construction, property, planning and construction firms and also in Service Management.

On the debit side, BOS are fully integrated in the sales and distribution (SD) process. The customer BOS forms the basis for describing the services to be performed in sales documents. Cost planning, sales price determination, and billing are carried out on this basis.

On the credit-side, BOS are completely integrated into the purchasing process.

Benefits

- BOS Structure: The BOS structure allows you to describe services completely.
- Cost and revenue planning
- Sales and distribution process

3.2.19 Master Data

Master data is one of the key factors in Sales and Distribution module.

- Material Master
- Customer Master
- Pricing Conditions

Partner Functions

Partner function allows you to identify which functions a partner has to perform in any business process. Consider a simplest case, where all the customer functions are performed by the partner customer. As these are mandatory functions, they have to be defined as obligatory functions in a SD system.

These functions are categorized as per partner type in Sales and Distribution system. The below partner types are Customer, Vendor, Personnel, Contact Person and common partner functions as per these partner types are −

- Partner Type Customer
  - Sold-To-Party
  - Ship-To –Party
  - Bill-To-Party
  - Payer

- Partner Type Contact Person
- Partner Type Vendor
- Forwarding Agent
- Partner Type Personnel
- Employee Responsible
- Sales Personnel

3.3 SAP S4/HANA Material Management (MM)

3.3.1 Material Master Data

The material master contains information on all the materials that a company procures or produces, stores, and sells. It is the company's central source for retrieving material-specific data. This information is stored in individual material master records.

The material master is used by all components in the SAP Logistics System. The integration of all material data in a single database object eliminates redundant data storage. In the SAP Logistics System, the data contained in the material master is required, for example, for the following functions:

- In Purchasing for ordering
- In Inventory Management for goods movement postings and physical inventory
- In Invoice Verification for posting invoices
- In Sales and Distribution for sales order processing
- In Production Planning and Control for material requirements planning, scheduling, and work scheduling

3.3.2 Service Master Data

Service master record contains the details of all the services that can be procured from an external vendor within an organization. It contains the description of services along with their unit of measure. Service master record serves as a reference for creating service purchase order, but it is not necessary. Service purchase order can also be created manually without reference.

3.3.3 Vendor Master Data

The key points about vendor master are as follows:

- Vendor Master Data is the enterprise main source of vendor-specific data. It includes information on vendors from which a company can procure, or can sell.
- A vendor master record contains information such as vendor's name, address, etc.
- Data in a vendor master record is divided into three categories −
    - **General Data** − General data is maintained at client level and it is valid for all organizational levels.
    - **Accounting Data** − Accounting data is maintained at company level and it is valid for all plants belonging to that company.
    - **Purchasing Data** − Purchasing data is maintained at purchasing organization level.

Vendor Account Group

Vendors are categorized according to their requirements. Some of the vendors having similar characteristics are grouped together and placed in one category. For example, all local vendors can be placed under one account group.

Number Range

When we create a vendor master record, every vendor is recognized by a unique number known as the vendor number. As in the case of material master, we have external as well as internal number assignments for vendor master.

3.3.4 Info Record Master Data

Material and vendor master are separate data records for keeping information of materials and vendors from where material is procured. The combined information of material and vendor altogether is kept in a record that we call as purchase info record. The key points about purchase info record are as follows:

- Purchasing info record stores information on material and vendor, supplying that material. For example, a vendor’s current price of a particular material is stored in info record.
- Purchase info record can be maintained at the plant level or at the purchasing organization level.
- Info record can be maintained for four procurement types, which are as follows −
    - **Standard** − Standard info record has information on standard orders (orders include details of vendor and material). This info record will include vendors price for supplying the particular material.
    - **Subcontracting** − Subcontracting info record has information on subcontract orders. This info record will include price for assembling the raw material that is supplied by the ordering party.

- **Pipeline** – Pipeline info record has information on material that is provided by vendor through pipes. For Example: like water, electricity.
- **Consignment** – Consignment info record has information on material that is kept at ordering party premises. This info record contains vendors price that is to be paid for withdrawing material from consignment stock.

3.3.5 Version Management

In the case of procurement transactions extending over a longer period of time (for example, in the procurement of capital goods), you may need to differentiate between various versions of the purchasing document. You may also need to refer to one particular version when corresponding with the vendor.

Version Management enables you to generate and manage versions of purchase requisitions and external purchasing documents, such as purchase orders. A version groups together the change documents generated in the course of subsequent processing of the relevant document. A version thus indicates the revision level of a document (version 0 = original document, versions 1 + = revisions) and provides the user with an overview of the various changes that may have been made in the course of time.

Version management thus represents an extension to the hitherto existing change documentation functionality for internal and external purchasing documents

3.3.6 Optimized Purchasing

The user departments of your firm have requirements of materials and services that have to be satisfied by Purchasing. Departments may notify Purchasing of their requirements via the SAP document purchase requisition. In other cases, purchasing may record them as requisitions itself, or create either standard purchase orders or releases against outline agreements directly, without first creating a requisition.

In order to be able to cover the requirements of your user departments quickly and efficiently, you wish to optimize your work processes in Purchasing.

In addition to the Purchasing-specific options available to you that are outlined here, you can also speed up procurement activities in the following ways:

- The materials planning system generates delivery schedule lines against existing scheduling agreements automatically, i.e. without any intervention by Purchasing.
- User departments create purchase orders directly (delegated Purchasing).

3.3.7 Standard Procurement Cycle

This scope item deals with employee requisitioning activities. An employee creates a shopping cart. A purchase requisition is generated, then is converted to a purchase order (Request for quotation step can be added before the Purchase Order creation). If the value exceeds a certain criterion, the purchase order must be approved. When the employee receives the goods, they perform a goods receipt confirmation. Invoice receiving can then be done.

Release strategy

We can have a lot of different strategies for different situations. For example, you can define a release strategy that is dependent on document type, you can define a release strategy based on the purchasing organization, purchasing group, or any other crucial information for a purchasing document. In most of the cases, one of the most used release strategy is based on the value of the purchase document.

Process Flow

- Create purchase requisition
- Request for Quotation (optional)
- Convert purchase requisition to purchase order
- Approve purchase order (optional)
- Confirm of goods receipt
- Create supplier invoice

Key Point

- Employee can create a shopping cart
- Procurement with advanced Payment through PO

Employee can confirm goods receipt directly for non-manufacturing purchase requisitioning, with no need to involve purchaser or warehouse clerk

3.3.8 Conditions & Price Determinations

This component enables you to store pricing stipulations agreed with the vendor (such as applicable discounts or surcharges, or stipulations regarding the payment of freight costs) in the system. You can enter these conditions in quotations, outline purchase agreements, and info records. You also have the option of entering general conditions at vendor level, for example. The system then applies the conditions in determining the price in purchase orders (POs). You can enter further conditions in the PO itself.

There are three kinds of price in Purchasing:

- Gross price

  Price without taking any possible discounts and surcharges into account.

- Net price

  Price taking any applicable discounts and surcharges into account.

- Effective price

  Net price after deduction of cash discount, with allowance for any miscellaneous provisions, delivery costs, and non-deductible taxes.

You can enter conditions for items in respect of which you do not expect to receive an invoice in purchase orders and outline agreements.

3.3.9 Request for Quotation

Purpose

In this process a purchasing employee requests quotations for the supply of a specific material from different vendors. A quotation comparison list enables him to select the best source of supply by evaluating the responses/quotations of the relevant vendors. The accepted quotation is later converted into a purchase order and a rejection letter is sent to the vendor(s) whose quotations were rejected.

Material-specific information including vendor pricing and lead-time from the quotation is captured within master data records.

Process Flow

- Request for Quotation
- List Quotations
- Quotation processing
- Comparison, rejection and selection of vendors

- Source list generation

Key Point

- Operate more efficiently and cost-effectively with streamlined tendering process.
- Keeping Vendor price history

3.3.10 Procurement of Direct Material

A purchasing administrator validates the accuracy of the purchase requisition and converts the purchase requisition into a purchase order. Alternatively, the purchase orders can be generated manually. The purchase order is subject to approval based on a predefined amount before being issued to a vendor. Goods are shipped from the vendor and the goods receipt is prepared with reference to the purchase order. The invoice is received from the vendor. Invoices are entered with reference to a purchase order.

Process Flow

- Manage sources of supply
- Display and assign purchase requisitions
- Convert assigned requisitions to purchase orders
- Purchase order management
- Receive goods from supplier
- Stock management
- Invoice receipt and management
- Outgoing payments
- Purchasing and inventory analytics

Key Point

- Operate more efficiently and cost-effectively with streamlined procurement that brings more spend under management
- Ensure highly automated procurement processes for direct materials

3.3.11 Return to Vendor

The return to supplier process begins with a requirement to return an item to a supplier. The buyer creates a return purchase order in the system. The return purchase order is similar to a standard purchase order except for a return flag that sets up the return delivery to enable shipment of the items back to the suppliers. Items are then withdrawn from the stock and a credit memo is generated that transfers the liability to the supplier.

Process Flow

- Create return purchase order

- Issue goods issue
- Review of pending credits manually
- Create credit memo

Key Point

- Supports all storage types of the preconfigured warehouse
- Return goods with a return reason captured in the document
- Track stock status during the return process

3.3.12 Purchase Contract

The Quantity contracts are agreements for a company to order a certain quantity of a product during a specified period. In source determination, contracts replace the purchasing information records and can be assigned in the source list as the fixed source for MRP.

Target groups are purchasing managers as well as buyers. If purchase requisitions and purchase orders do not yet exist, they are created after the contract. You can check the released purchase orders that are referenced to a contract by monitoring the contract.

Process Flow

- Reduce procurement costs
- Secure supplies
- Maintain transparency of supplier agreements

Key Point

- Supports Create a purchase contract
- Make mass changes to purchase contracts
- Approve purchase contract
- Monitor notification (optional)
- Manage source lists
- Create a purchase requisition
- Assign requisition and creating purchase order
- Find purchase documents by requirement tracking number
- Approve purchase orders
- Monitor contract item (optional)
- Post goods receipt
- Create supplier invoice

3.3.13 Vendor Evaluation

The Vendor Evaluation component helps you select sources of supply and facilitates the continual monitoring of existing supply relationships. It provides you with accurate information on prices, and terms of payment and delivery. By evaluating vendors, you can improve your enterprise's competitiveness.

Based on detailed information, and in collaboration with the relevant vendors, you can quickly identify and resolve any procurement problems that may crop up from time to time.

You can check the reliability of the vendors from whom you procure services on a plant-by-plant basis. You can determine whether the vendors perform the services within the specified timeframes and appraise the quality of the work carried out.

Process Flow

- Maintain Vendor Evaluation

Key Point

- Evaluate the supplier performance
- Analyze KPIs based on the evaluation

3.3.14 Material Requirements Planning

This process enables your material requirements planning department to automate the material planning. The main function of material requirements planning is to guarantee material availability and to avoid delays in order fulfillment. The system checks the availability of each material and creates planned orders/purchase requisitions in case of shortages. Remaining shortages are displayed in the appropriate apps where the planner can analyze the situation.

You start this process by creating demands that are interpreted by the planning run as expected customer demands and are used to replenish stock levels. You then schedule the MRP run. The system creates planned orders/ purchase requisitions that trigger external procurement on completion of MRP. You can evaluate the results and make manual adjustments.

Process Flow

- Accelerated creation of planned Orders / purchase requisitions
- Automatic detection of shortages
- Higher accuracy of planned quantities
- Cost savings through process automation

Key Point

- Manage forecast demand (PIR)
- Schedule MRP run
- Monitor MRP run (material issues and key figures)
- Follow up on change requests

- Monitor and manage material shortages
- Monitor and manage external requirements
- Analyze PIR Quality

3.3.15 Consumption-Based Planning

Purpose

The central role of MRP is to monitor stocks and in particular, to automatically create procurement proposals for purchasing and production (planned orders, purchase requisitions or delivery schedules). This target is achieved by using various materials planning methods which each cover different procedures.

Consumption-based planning is based on past consumption values and uses the forecast or other statistical procedures to determine future requirements. The procedures in consumption-based planning do not refer to the master production schedule. That is, the net requirements calculation is not triggered either by planned independent requirements or dependent requirement. Instead, it is triggered when stock levels fall below a predefined reorder point or by forecast requirements calculated using past consumption values.

3.3.16 Procurement of Services

Purpose

This scope item contains the creation and approval of purchase orders for services. Alternatively, the process can be triggered via the creation of a purchase requisition, which can later be converted to a purchase order. Standard items as well as limit items can be processed with this scope item. The service fulfillment can be steered and monitored with the service entry sheet. After this, the invoicing process is triggered.

Process Flow

- Manage purchase requisitions
- Manage purchase orders
- Manage service entry sheets
- Manage invoices

Key Point

- Provide efficient and cost-effective streamlined procurement processes
- Ensure highly automated processes for the procurement of service
- Reduce manual effort greatly
- Real-time monitoring of the service fulfillment
- Monitor purchase order items with analytical list page

3.3.17 Consumables Purchasing

This scope item contains the creation and approval of purchase orders for consumables. Alternatively, the process can also be triggered via a purchase requisition, which can then be converted to a purchase order. The scope item can be processed for standard items as well as for limit items. As the value of the goods is directly expended to an account assignment category, no inventory is provided for consumables. After the supply and the subsequent goods receipt, the invoicing process is triggered.

Process Flow

- Manage purchase requisitions
- Manage purchase orders
- Manage goods receipts
- Manage invoices

Key Point

- Streamline procurement processes in an efficient and cost-effective manner
- Ensure highly automated processes for the procurement of consumables
- Reduce manual effort greatly
- Monitor the procurement progress in real-time
- Monitor purchase order items with analytical list page

3.3.18 Subcontracting

A subcontract purchase requisition is generated either via the Material Requirements Planning (MRP) process or manually by a requestor. A buyer validates the accuracy of the purchase requisition and converts it into a subcontract purchase order. The purchase order is subject to approval based on predefined parameters prior to being issued to a vendor.

The consumption of sent components is recorded upon receipt of the value-added finished material. The vendor sends the invoice for the services provided, which is paid during the normal payment cycle.

Process Flow

- Display initial requirements situation
- Create planned independent requirements
- Plan material requirements at plant level
- Assign purchase requisition and create subcontract purchase order
- Approve purchase orders
- Transfer stock to subcontracting stock
- Receive goods from subcontracting PO

- Receive invoice from subcontracting PO
- Review invoice receipt from subcontracting PO
- Post outgoing payment

Key Point

- Identify and track individual items of material in in-house operations
- Trigger follow-on functions from BOM explosion, such as component delivery to subcontractor
- Post value flow automatically
- Post stocks into corresponding stock types automatically

3.3.19 Service Entry Sheet

A service entry sheet stores a record of all the services that have been procured. In case of goods procured, we maintain a goods receipt document; whereas in case of services, we maintain a service entry sheet. It accommodates the charges that we need to pay to the vendor.

When the external service provider delivers the services, they intimate the organization that the work is completed. This actual work done or service provided will need to be entered into the system. SAP service entry sheet helps the organization to record the work actually done or the service provided by the external service provider.

SAP service entry sheet involves a two-steps process: SAP service entry sheet creation and service acceptance.

3.3.20 Inter Company Stock Transfer

Purpose

Tranfer material requested automatically by MRP or manually by a buyer from one plant to another. Both plants belog to the same organziation but different company codes.

Benefits

- Transparent view of outstanding stock transfers, stock in transit.
- Efficient processing of internal stock transfers

Key Process Flow

- Stock transport requisitons (with MRP)
- Changing stock transport purchase order (with MRP)
- Stock transport order (without MRP)
- Delivery for stock transport order

- Delivery due list
- Picking confirmation
- Goods issue
- Picking information
- Goods issue
- Recieving transfered material
- Invoices for delivery and purchase order
- Inter company billing

3.3.21 Stock Transfer without Delivery

Purpose

The process begins with a requirement to transfer material from one plant to another within the same company code. The stock transfer without delivery can be performed in two different ways.

A one-step transfer posting at the issuing plant moves the stock immediately from the issuing plant to the receiving plant. This is useful if the distance between the two plants is short and when there is no need for stock-in-transit stock overview.

A buyer at the receiving plant requests material with a stock transport order. This is useful if the issuing plant needs a formal request to send material to the receiving plant or the distance between the two plants is longer and there is a need for stock-in-transit stock overview.

There are no master data requirements beyond the material master to support the stock transfer process. The material master must exist in both the procuring (receiving) plant and the providing (issuing) plant. In addition, stock transfer purchase orders are not subject to approval like other purchase orders.

Process Flow

- One-step stock transfer·
- Create stock transport order
- Post goods issue for stock transport order
- Check the status of the stock transfer
- Receive transferred materials

Key Point

- Handle processes simply where delivery is not required
- Generate fewer documents
- Monitor stock in transit

3.3.22 Stock Transfer with Delivery

The stock transfer process begins with a requirement to transfer material from one plant to another within the same company code. This request, a stock transfer requisition, may be created automatically by MRP in the procuring plant, or manually by a buyer.

The process also works without MRP. Here, the buyer creates the stock transport order directly. The only master data requirement is the material master to support the stock transfer process. The material master must exist in both the procuring (receiving) plant and the providing (issuing) plant. Unlike other purchase orders, stock transfer purchase orders are not subject to approval. A buyer validates the accuracy of the stock transfer order and converts it into a stock transfer order.

Without MRP, the buyer creates the stock transfer order directly. A warehouse clerk at the issuing plant monitors the materials to be shipped, and creates necessary deliveries. Once a delivery is created, a pick list is generated for the materials. A warehouse clerk gathers the materials and confirms the picked quantities. Once the delivery is complete, the delivery quantities are issued, appropriate documentation is generated, and the shipment is sent, ending the process for the issuing plant.

Goods are received at the receiving plant referencing the delivery number on the shipping documents. Inventory is received into a location based on fixed parameters proposed from the material master which can be changed at time of purchase order creation or goods receipt (transactional data capture).

Process Flow

- Create stock transport purchase requisitions (with MRP)
- Change stock transport purchase orders (with MRP)
- Create stock transport orders (without MRP)
- Create deliveries for stock transport orders
- Display delivery due list
- Print picking confirmation
- Post goods issue
- Receive transferred material

Benefits

- Transparent view of outstanding stock transfers and stock-in-transit
- Enables efficient processing of internal stock transfers

3.3.23 Batch Management

In various industries – particularly the process industry – you have to work with homogenous partial quantities of a material or product throughout the logistics quantity and value chain.

There are various reasons for this:

- Legal requirements (for example, the guidelines set out by GMP (Good Manufacturing Practice) or regulations on hazardous material
- Defect tracing, callback activities, and regression requirement
- The need for differentiated quantity-and value-based Inventory Management (for example, due to heterogeneous yield/result qualities or varying constituents in Production.
- Differences in usage and the monitoring thereof in materials planning in SD and Production.
- Production or procedural requirements (for example, settlement of material quantities based on different batch specifications).

3.3.24 Inventory Management

Purpose

This scope item covers core inventory management processes, including the following processes: Goods Issue, Goods Receipt, Reservations, Scrapping, block stock, unblock stock, one step stock transfer, two steps stock transfer, stock overview, and material document overview.

Process Flow

- Perform customer returns scrapping: Goods issue to CO-PA
- Perform general stock scrapping: Goods issue to cost center
- Block material - stock transfer unrestricted to blocked
- Unblock material - stock transfer blocked to unrestricted
- Unblock material - stock transfer blocked to quality inspection stock

Key Point

- Management of material stocks on a quantity and value basis
- Planning, Entry, and Documentation of all Goods Movements
- Carrying out the Physical Inventory
- Support process-related transfer postings
- Support legally required transfer postings

3.3.25 Physical Inventory

Purpose

Performing this business process, you can control your warehouse stock and meet legal requirements.

In this process, you create physical inventory (PI) documents for a chosen number of storage bins or products on a regular basis to spread the PI workload over the year. You carry out the counting using a radio frequency (RF) device or paper.

By posting the PI documents, you adjust the book inventory in the SAP S/4HANA application. By posting the differences to the SAP S/4HANA application, you balance the stock accounts. You can monitor the progress of your PI by using the warehouse management monitor.

Process Flow

- Create PI documents
- Count the bins or products
- Create recount documents, and carry out the recounting
- Post the PI documents
- Set completeness
- Post the differences

Key Point

- Establishes an inventory counting process – with a periodic physical counting approach – via pre-configured software
- Helps maintain accurate inventory levels and manage replenishment processes for demand and supply planning
- Physical inventory can be created on special stock

3.3.26 Logistics Invoice Verification

Logistics Invoice Verification is a part of Materials Management (MM). It is situated at the end of the logistics supply chain that includes Purchasing, Inventory Management, and Invoice Verification. It is in Logistics Invoice Verification that incoming invoices are verified in terms of their content, prices and arithmetic. When the invoice was posted, the invoice data is saved in the system. The system updates the data saved in the invoice documents in Materials Management and Financial Accounting.

3.4SAP S4/HANA Plant Maintenance (PM)

3.4.1 Corrective Maintenance

Purpose

Corrective maintenance is the process of maintaining the technical objects whenever a breakdown or failure occurs. The plant maintenance component provides a comprehensive notification and order system to facilitate this process. You can process a repair using several planning stages, such as preliminary costing, work scheduling, material provision, resource planning, and permits. You can also react immediately to damage events causing a production shutdown, and to create the required maintenance work orders and shop papers

with a minimum of entries in the shortest possible time.

Process Flow

- Create malfunction report
- Create maintenance order
- Release maintenance order
- Print Job Card
- Confirm maintenance order
- Show costs on maintenance order
- Technically complete maintenance order

Key Points

- Support processing of maintenance operations with internal resources
- Increase transparency of costs and time spend on individual assets for maintenance purposes
- Simplify actual order cost tracking and assignment of costs to settlement receiver for greater transparency and cost controlling
- Enable recording of working times on the cost objects for effort tracking
- Plan stock and non-stock materials and services for the repair

3.4.2 Preventive Maintenance

Purpose

Prevent system breakdowns or breakdowns of other objects that have high repair costs and can result in greater costs due to production downtime. Preventive maintenance supports the processes to plan the scope and time of the maintenance work for inspections, maintenance, and repairs in advance. The quality of products manufactured is substantially affected by the operational condition of the production plant. There is a need for quality assurance to be more cost effective to maintain objects regularly, and in return avoid a more expensive breakdown. You can determine the data required for this using past data supplied by the system. In addition to internal company aspects for planned maintenance, external factors should be considered due to an increasing number of conditions set by legislative bodies demanding more stringent requirements on planned monitoring and maintenance of objects.

Process Flow

- Maintain maintenance strategies
- Create task list for equipment
- Create maintenance plan

- Schedule maintenance plan
- Release preventive maintenance order
- Print Job Card
- Confirm maintenance order
- Show costs on maintenance order
- Technically complete maintenance order

Key Points

- Plan better by changing from reactive to proactive maintenance to enable better planning
- Ensure high availability of the equipment and therefore better performance and utilization of the assets
- Reduce the total maintenance cost by reducing the breakdowns
- Support external requirements, such as manufacturer recommendations, legal requirements, and environmental requirements

3.4.3 Overhaul Management

Business Process Description

This process describes a typical Overhaul Maintenance (OM) process. During overhaul maintenance, all the main systems of the industry would be shut down and the maintenance would be executed according to a predefined project schedule.

Overhaul maintenance is a large-scale maintenance project involving allocation of budget to different project tasks. Various resource requirements need to be identified, scheduled, and monitored for all OM activities during the period. Usually, the spare part procurement would be done in advance in material management to avoid material shortages during the maintenance activities.

An OM project is created with WBS elements, required networks, and network activities. Maintenance Orders created due to various pending malfunctions are linked to the WBS Elements or Network Activities. These malfunctions are fixed during the overhaul period. The maintenance order collects the costs of the maintenance activities and settles it to the WBS.

Process Flow

- Create a project
- Edit WBS cost planning and distribute WBS budget
- Execute network scheduling
- Create a maintenance order and assign it to WBS/network

key Points

- Planning and distribution of budget data for overhaul maintenance project network/activities
- Creation of a network activity or maintenance order according to the maintenance requirements and assignment to the corresponding network/activities
- Planning, scheduling and monitoring of dates for WBS elements, network activities, or maintenance orders.

3.4.4 Refurbishment Maintenance

Business Process Description

If a piece of material which managed as a repairable spare is defective in a technical system, it must be replaced by a functional repairable spare. For this reason, the defective repairable spare is dismantled from the functional location and returned to the warehouse. Meanwhile a functional repairable spare is withdrawn from the warehouse and installed in the functional location the returned spare part needs to be repaired.

The maintenance planner will create a refurbishment order without valuation types, the defective repairable spare will be withdrawn from the warehouse and refurbished. When the refurbishment is finished, the equipment will be returned to warehouse. After the settlement of the refurbishment order, the moving average price of this spare will be updated. So, the moving average price of this spare will vary during the different phases of refurbishment.

Process Flow

- Uninstall the damaged equipment from the Maintenance Plant.
- Move the material to the warehouse.
- Creation of Refurbishment order to collect the cost for the refurbishment activity.
- When the Refurbishment process is executed, the state of material is changed from damaged to Refurbished.
- Reinstallation of equipment in the Maintenance plant.

Key Points

- Support processing of maintenance the defected spare parts.
- Increase transparency of costs and time spend on individual assets for maintenance purposes
- Simplify actual order cost tracking and assignment of costs to settlement receiver for greater transparency and cost controlling for the spare parts.

3.4.5 Fleet Management

Key of Benefits

- Daily monitoring of Distance traveled by vehicle.
- Daily consumption of fuel by vehicle
- Average Distance & Fuel consumption over the period
- Fuel Consumption / KM covered or based on daily activity
- Performance Based Maintenance of vehicles

Process overview

- You can map the vehicles as equipment master records and enter vehicle-specific additional data. This means that you can now specify important fleet data such as the license plate number, load volume, consumption data, fuel card number, engine data, or fuel type and so on directly in the equipment master record.
- You can also use the fleet object as a reference object for maintenance or service tasks. The fleet object can act as the reference object for either a notification or an order. You can also perform maintenance planning for a fleet object. You can make the date of the next scheduled service dependent on the distance counter, the time counter (for example, the time meter), or any other fleet counter.

3.4.6 Calibration Processing

Purpose

This scenario describes how to process your test or measurement equipment in a calibration inspection. The objective of a calibration inspection is to determine whether each piece of equipment specified in the maintenance order meets the predefined performance specifications. In this process, you:

- Inspect the equipment specified in a maintenance order
- Record inspection results for each piece of equipment
- Valuate each piece of equipment
- Make the usage decision for the inspection lot

Process Flow

- The system creates an inspection lot automatically when a maintenance order is released.
- You inspect the characteristics for each piece of equipment according to the information contained in the inspection instruction.
- You record inspection results for all required characteristics in each operation. When you record inspection results, you valuate and close each characteristic in the operation, and then

valuate each piece of equipment for the operation.

- You make the usage decision for the inspection lot to complete the inspection and to trigger various automatic follow-up actions.
- You complete the maintenance order

3.5 S4/HANA Warehouse Management (WM)

Purpose

The SAP Warehouse Management system (WMS) provides flexible, automated support in processing all goods movements and in managing stocks in your warehouse complex. The system supports scheduled and efficient processing of all logistics processes within your warehouse.

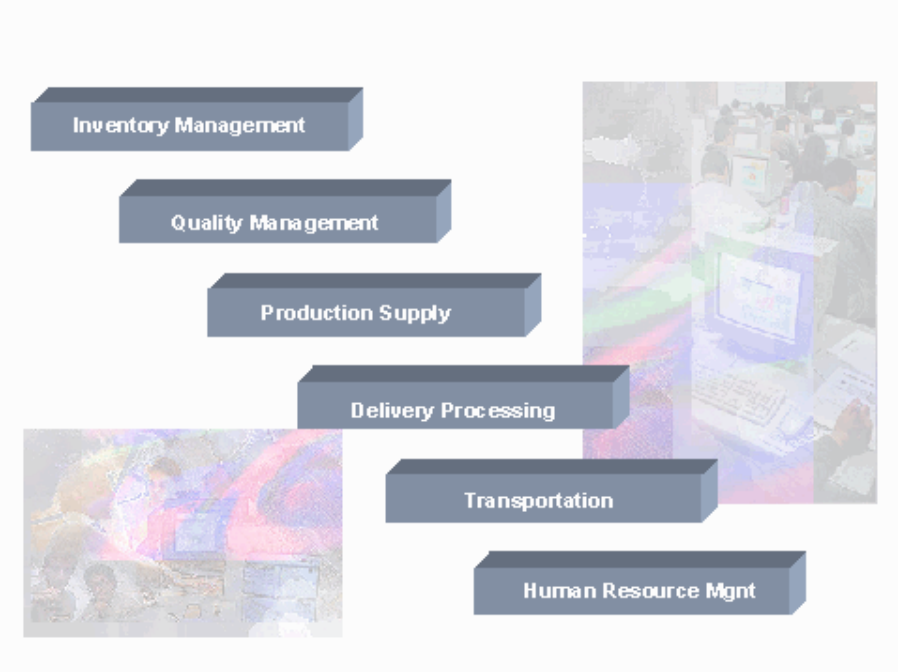
Implementation Considerations

If you manage your warehouse stocks with SAP Inventory Management (MM-IM), you manage the quantities and values of stocks in several storage locations.

In comparison, the WMS allows you to map your entire warehouse complex in detail to storage bin level. Not only do you gain an overview of the entire quantity of a material in the warehouse; you can also always determine exactly where a certain material currently is in your warehouse complex. With the WMS you can optimize the use of all of your storage bins and warehouse movements, and store material stocks from several plants together in warehouses with random storage.

Integration

The WMS is fully integrated into the SAP environment. Business processes, which you trigger in other application components, lead to physical goods movements in your warehouse. You organize, control, and monitor these goods movements with the WMS.



Features

- Storage Bin Management

You map your entire storage facilities in the Warehouse Management system. In doing so, you can set up various storage facilities such as automatic warehouse, high rack storage areas, bulk storage

or fixed storage bins in various storage types, according to your needs.

You manage material stocks at storage bin level. You can define these storage bins according to your own requirements. Every storage bin in your warehouse is mapped in the system. This lets you monitor all warehouse movements at all times. You can follow where a certain material is in your warehouse.

SAP Inventory Management and the SAP Warehouse Management system are fully integrated. With its inventory procedure and recording of stock differences, the system ensures that the inventory balance in Inventory Management always corresponds to the warehouse stock in the WMS.

- Goods Movements

You process all goods movements that affect your warehouse via the WMS. This includes goods receipts, goods issues, stock transfers, material staging for production, automatic replenishment, managing hazardous materials, and processing stock differences in your warehouse.

The WMS optimizes warehouse capacities and material flows using putaway and stock removal strategies, which you can adjust to suit your individual needs, or by using storage units.

- Planning and Monitoring

The WMS offers you an overview of all goods issues and warehouse stocks. The system supports you in planning, monitoring, and optimizing work processes. For example, it gives you a foresighted view of the workload in the coming days or allows you to intervene in good time during critical warehouse processes, so that you can execute warehouse movements on time. Via the RF monitor, you get an up-to-date picture of all of the activities in the warehouse, which means that you can control the actual work in the warehouse using the RF monitor.

- Radio Frequency Connection

In order to structure the work in the warehouse efficiently and cost-effectively, you control the warehouse workers' work steps clearly and simply via mobile radio-frequency terminals.

Radio frequency connection (RF connection) to mobile date entry achieves quick and flawless data transfer. The RF machines receive data directly from the SAP system and transfer data back to the system. Using barcodes, you can record information to be recorded and verify it. This means that you ensure a high standard of quality in your warehouse.

- Warehouse Control

WMS also has an interface to external systems (warehouse control units), so that you can integrate automatic putaway, stock removal systems or fork lift control systems into the warehouse management system for all warehouse movements with the help of this ALE interface.

3.5.1 Basic Stock Management

The following topics regarding the management of stock using the SAP Warehouse Management application are addressed in this section:

- Material Master Data
    1. Defining Warehouse Data in the Material Master Record
    2. Displaying the Material Master Record
- The Quant and Stock Management in WM
    1. Changing Quant Data
    2. Displaying Quant Information
- Types of Stock
    1. Stock Category
    2. Displaying Stock in the Warehouse
    3. Blocking Stock in the Warehouse
- Units of Measure
- Batch Management
    1. Shelf Life Expiration Date
    2. Displaying Materials with a Shelf Life Expiration Date (SLED)
    3. Storing Materials in the Warehouse
- WM Interface to Inventory Management (IM)
    1. Interim Storage Bins
    2. Creating Interim Storage Bins with Predefined Coordinates
    3. Order of Postings
    4. Posting First in IM
    5. Posting First in WM
    6. Comparing Stock Quantities in WM and IM

3.5.2 Hazardous Materials Management

Although many materials that are classified as dangerous can be placed into storage along with other goods, some require special handling and must be put into specially designed storage facilities. Some examples of these materials include:

- Explosives
- Petroleum fuels and oil
- Poisons
- Corrosive liquids
- Radioactive materials

SAP Warehouse Management (WM) is designed to manage the handling and storage of hazardous

material based on characteristics that are defined in the hazardous material record.

3.5.3 Goods receipt

Purpose

A goods receipt in the Warehouse Management system (WMS) is the physical inbound movement of goods or materials into the warehouse. It is a goods movement that is used to post goods received from external vendors or from in-plant production. All goods receipts result in an increase of stock in the warehouse.

Integration

A goods receipt in the WMS can be triggered by several business transactions in various components of the SAP system. The corresponding reference document in the WMS triggers the goods receipt:

Reference documents for goods receipt in the WMS

Application Component	**Relevant WMS Document**
Inventory Management (MM-IM)	Transfer requirement
Production Planning (PP-SFC)	Transfer requirement
Decentralized Warehouse Management (LE-IDW)	Inbound delivery

3.5.4 Goods Issue

Use

Goods issue from the Warehouse Management system (WMS) is the physical issue of goods or materials from the warehouse. Goods issue posting results in a decrease in stock in the warehouse. In WMS, you post a goods issue for the following business transactions:

- Delivery of goods to customers
- Material staging for production
- Internal material consumption (to a cost center or project)

Integration

Goods issue in the Warehouse Management system can be triggered by several business transactions in various components of the SAP System on the basis of reference documents.

Reference Documents for Goods Issue in the WMS

Application Component	***Relevant WMS Document***
Inventory Management (MM-IM)	Transfer Requirement
Production Planning (PP-SFC)	Transfer Requirement
Shipping (LE-SHP)	Outbound Delivery

3.5.5 Stock Transfers and Replenishment

Purpose

Stock transfers in the Materials Management system include the physical movement of materials from:

- One plant/storage location to another plant/storage location
- Warehouse number to warehouse number
- Storage bin to storage bin (internal transfers)

For stock transfers within the same warehouse complex (that is, within a warehouse number), you can create, manage, and display information about the movement of stock from the time it is received until it leaves the warehouse in the Warehouse Management system (WMS). For stock transfers from one storage location to another storage location, the process begins in the Inventory Management (IM) component and is completed in the WMS.

3.5.6 Posting Changes

Use

A posting change generally refers to change to the stock data of a material affecting bookkeeping information. In the case of most posting changes, for example during release from quality inspection stock, the goods remain in the same physical storage bin.

Integration

You generally trigger posting changes in Inventory Management (MM-IM). If you implement the Warehouse Management system (WMS), you process the posting change notice from MM-IM in the WMS. For more information, see Processing Posting Changes .

You can also trigger material status changes in the WMS, for example if a physical goods movement in the warehouse is the cause for the posting change. For more information, see Posting Changes in the WMS Made Automatically in Inventory Management .

3.5.7 Putaway and Picking Strategies

In the Warehouse Management (WM) application component, you employ putaway and removal strategies used by the system to search for storage bins in the most expeditious manner.

For inbound movements, in conjunction with controls entered in the material master record, the putaway strategies assist the WM system to utilize the available warehouse capacity, automatically assigning optimum locations for goods received in the warehouse.

For outbound movements, the system uses similar user-defined controls to execute the appropriate picking strategy to assign the best picking location. If you decide to manually process certain stock movements, you can change source and destination storage bins that are automatically proposed by the system.

When the system creates transfer orders to move goods into or out of the warehouse, you do not have to intervene when it comes to finding storage bins. This guarantees that stock movements

are processed quickly and consistently. If you need to permanently change the characteristics of these strategies, you can do this at any time using the customizing tasks.

3.5.8 Storage Unit Management

Purpose

Storage unit (SU) management in the Warehouse Management (WM) application component makes it possible to optimize warehouse capacity and control material flow using storage units within the warehouse.

A storage unit is a logical grouping of one or several amounts of material such as a pallet or a container that can be managed within a warehouse as a unit that belongs together. Storage units can be either homogeneous (containing one material item only) or mixed (containing two or more material items).

All storage units, whether the materials are stored on standard pallets, wire baskets or other containers, are assigned an identifier — a number — which is maintained in the system as the storage unit number. Therefore, it is possible at any given time to know where each storage unit is located in the warehouse complex, the amount of material contained in it, and which operations have been processed or planned for it.

When SU management is not active in a storage type, all stock is managed as separate quants at the storage bin level. With SU management, stock is managed at the pallet or storage unit level. A storage bin can have one or more storage units. Similarly, each storage unit can consist of one or more quants.

Selection Criteria

Storage unit management is generally activated in the warehouse for the following reasons:

- Movement of mixed pallets (with more than one material) as a single unit within the warehouse.
- Identification and management of materials using storage unit numbers assigned internally or externally.
- WM can communicate with fork lift control systems via an interface without having to maintain material data in the external system.

3.5.9 Inventory

Use

You use the inventory to regularly carry out a physical inventory in your warehouse. You compare the material stocks that are physically present with the data managed in the Warehouse Management system (WMS). You enter inventory differences, as recorded in the results of the physical inventory, to update the accounting side of the stock data. The inventory is regarded as completed if an inventory was taken for every storage bin in the warehouse at least once during

the fiscal year.

Integration

If you use the WMS, the inventory takes places at Warehouse Management level. The WMS uses the interface to Inventory Management to pass on the inventory differences determined to Inventory Management, where you can then clear them.
In contrast to the material-related inventory in Inventory Management (MM-IM), in the WMS you manage the inventory for each storage bin or quant for the warehouse numbers managed by the system.

3.5.10 Mobile Data Entry (LE-MOB)

Purpose

Currently, the work process in the warehouse is characterized by speed, reliability, and precision in processing individual goods movements. To make sure that work is performed efficiently and at a reasonable cost, the warehouse staff requires simple and easy-to-view control of each individual process. The radio frequency (RF) solution provides fast and error-free data communication through the use of mobile RF terminals. This, in turn, provides a high standard of quality.
The RF terminals receive data directly from the SAP System and transmit the results back to the system. You can scan the information that needs to be recorded, such as handling unit (HU)numbers, using a bar code (for example, based on UCC/EAN128 standards), and also scan the bar code to verify the storage bins.
The display of information on the RF terminal is possible with a graphical user interface. You can execute the individual functions using pushbuttons on a touch screen. If you are using a character-based device, SAP provides a special, non-graphic user interface.
Since the RF solution is an integral part of the standard SAP System, you can access the RF transactions either directly through the SAP menu or from mobile data-entry devices. Generated information is immediately available to the RF user and transmitted back to the SAP database instantly.

Integration

Mobile Data Entry is integrated with SAP's Warehouse Management System (WMS) and Task and Resource Management (TRM).

Warehouse Management System (WMS)

The RF solution supports the movement of goods in both HU-managed and non HU-managed storage locations.

- In HU-managed storage locations, the RF solution supports the movement of goods through the specification of the respective handling units.
- In non HU-managed storage locations, you can work with handling units as up to now in the delivery and in the shipment.
  For more information, see Handling Unit Management.

Task and Resource Management (TRM)

TRM itself supports the customization of data presentation on RF devices. As part of this customization, you can include Mobile Data Entry menus and functions. For more information, see Presentation Management in the SAP Library for Task and Resource Management.

Features

Mobile Data Entry provides a number of features, including the following:

1. GUI and Character Device Support

Mobile Data Entry supports both GUI and character-based devices. For more information, see RF Device Support.

2. Bar Code Support

Mobile Data Entry supports the use of bar codes for identification and verification purposes. For more information, see Bar Code Support.

3. RF Support of Warehouse Management Processes

Mobile Data Entry supports a wide variety of warehouse processes, including:

- Goods receipts and issues
- Picking
- Putaway
- Interleaving
- Inventory counting
- Loading and unloading

The RF solution guides the user through each activity that is executed in the warehouse. Limited information is displayed to the users, which they must then verify by scanning bar codes. For more information, see RF-Supported Warehouse Processes.

4. RF Activity Control

Mobile Data Entry supports the assignment of transfer orders to queues, according to physical areas of the warehouse and activities. The TOs can then be processed by users assigned to those queues.
The warehouse manager can utilize the RF Monitor, which operates as a central coordination point to ensure that the processing of transfer orders runs as efficiently as possible. For more information, see RF Queue Management.

5. Flexible RF Customizing

In Customizing for Mobile Data Entry, you can define the following:

- The size and number of screens
- Menus and menu sequences

- Fields to be verified
- Bar code types and Application Identifiers
- Use of the Enter function

3.5.11 Value-Added Services (LE-WM-VAS)

Purpose

SAP's Value-Added Services enables you to manage and control the execution of value-added services (VAS) in your warehouse.

Using Value-Added Services, you can perform and manage the following types of VAS:

- VAS with handling unit (HU) changes, such as gift wrapping two materials
- VAS without HU changes, such as wrapping materials on the same pallet

3.6 S4/HANA Project System (PS)

3.6.1 Purpose

Both large scale projects, such as building a factory, and small-scale projects, such as organizing a trade fair, require precise planning of the many detailed activities involved. The project manager has the job of ensuring that the project is executed efficiently, on time, and within budget - which he or she achieves by ensuring that the required resources and funds are available as and when needed.

Projects are generally part of the internal processes of a company. To be able to control all tasks in project execution, you need an organizational form that is specific to the project and which is shared by all departments involved. Before you can carry out a project in its entirety, the project goals must be precisely described and the project activities to be carried out must be structured. A clear, unambiguous project structure is the basis for successful project planning, monitoring, and control.

You structure your project per the following points of view:

- By structures, using a work breakdown structure (WBS)
- By process, using individual activities (work packages)

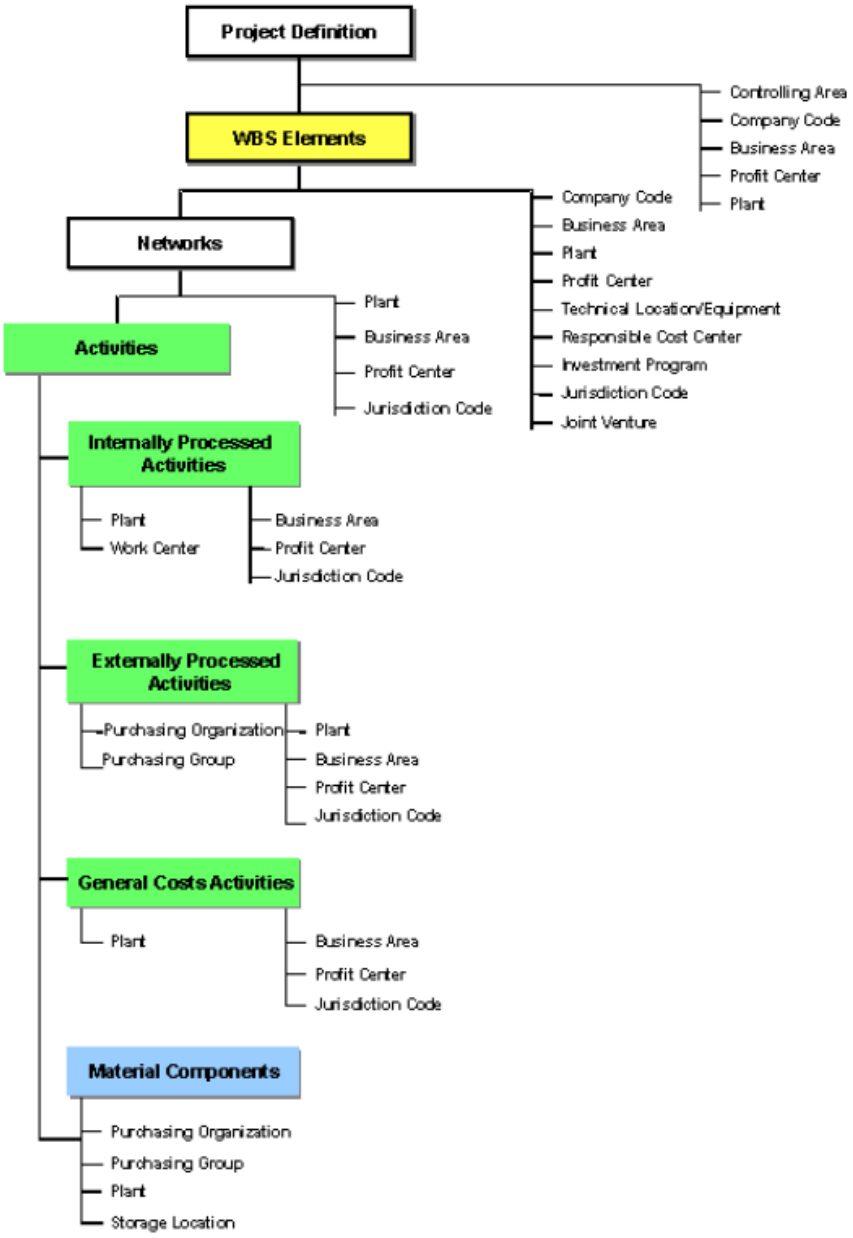
Project managers usually distinguish between two types of project:

- Externally financed projects
  - RAK PSD projects
- Internally financed projects
  - Overhead cost projects
  - Capital investment projects

3.6.2 Organizational Structure

Each project starts with the definition and classification of the structures required for processing and the incorporation of these into the existing enterprise structure. The Project System has no organizational structures of its own; you incorporate it into the existing structure by making assignment to the organizational units in Accounting and Logistics. It is

this which enables the Project System to present data clearly and in many different ways.



Project

Projects are tasks with special characteristics:

- They are generally complex, unique, and involve a high degree of risk.

- They have precise goals which are agreed on by you and the ordering party.
- They are limited in duration and are cost and capacity intensive.
- They are subject to certain quality requirements.
- They are mostly of strategic importance for the company carrying them out.

Projects are generally part of the internal processes of a company. To be able to control all tasks in project execution, you need an organizational form that is specific to the project and which is shared by all departments involved.

To be able to carry out a project in its entirety, the project goals must be precisely described and the project activities to be carried out must be structured. A clearly and unambiguously structured project is the basis for its planning, monitoring, control and success.

A project is structured:

- According to how it is organized
- According to the processes involved

Work Breakdown Structure

A work breakdown structure (WBS) is a model of the work to be performed in a project organized in a hierarchical structure. The WBS is an important tool which helps you keep an overview of the project:

It forms the basis for organization and coordination in the project.

It shows the amount of work, the time required, and the costs involved in the project.

It is the functional basis for further planning steps in a project, such as process planning, cost planning, scheduling, date and capacity planning, or costing, as well as project control.

The project structure can be represented according to different criteria:

- By phase (logic-oriented)
- By function (function-oriented)
- By object (object-oriented)

Network

A network can represent the sequence of activities in a project or the sequence of a single activity within a project. You can graphically display various structural elements of a project and their interdependencies in the Project System.

During the life of a project, networks are used as a basis for planning, analyzing, controlling and monitoring schedules, dates, and resources. (such as personnel, machines, PRTs, materials, documents, and drawings).

The following are examples of the types of questions you can answer with the information you get from a network:

- Where we are unclear on the processes in the project and what are the possible consequences?
- Where are the scheduling uncertainties and how significant are they?
- When and in what amount do we incur costs and make expenditures for this project?
- When and in what quantity do resources have to be available so that we can keep to the schedule?

In the Project System networks are activity-on-mode networks.

The essential components of a network are:

- Activities
- Relationships between the activities

Activities

The most important data describing an activity in the Project System is:

- Work center in which the activity is to be carried out
- Duration of the activity
- Start and finish dates for the activity
- Resources required to carry out the activity
- Texts and documents describing the activity

Relationships

There is usually a reason for a specific sequence of activities in a network. For example, there may be technical dependencies between individual activities.

These dependencies are represented by relationships in which one activity is the predecessor or the successor of another activity.

The relationship type specifies how the individual activities are linked with each other:

- Finish - Start (FS) Relationship
  - Relationship between the finish of one activity and the start of its successor.
- Start - Start (SS) Relationship
  - Relationship between the start of one activity and the start of its successor.
- Finish - Finish (FF) Relationship
  - Relationship between the finish of one activity and the finish of its successor.
- Start - Finish (SF) Relationship
  - Relationship between the start of one activity and the finish of its successor.

Structures

To be able to carry out a project in its entirety, the project goals must be precisely described and the project activities to be carried out must be structured. A clearly and unambiguously structured project is the basis for its planning, monitoring, control and success.

Depending on the type of project and the emphasis in project monitoring, you structure your project in the Project System using the operative structures work breakdown structure (WBS) and/or networks Standard structures, for example standard WBS and standard networks allow you standardize and reuse structures and sequences of events in your projects.

Documents

Complex projects require comprehensive documentation and the provision of technical documents. The Project System uses, for example, the high-performance R/3 document management facility, so that you can access the various project-related documents that are not created in the R/3 System. Examples include CAD drawings and contracts.

In the Project System itself, you can enter extensive texts for the project (called "PS texts"), such as requirements definitions, work package definitions, or logs, directly into the Project System, when processing the relevant activities and WBS elements.

Document management using the intranet and Internet ensures a comprehensive and coherent flow of information over the various business areas involved in the project. For the purposes of decentralized project planning and control, you can access documents without having to access the SAP System directly.

3.6.3 Project Setup for Engineering & Construction

- Maintain the original estimate for an assessment on the scope of services
- Devise a project framework following a Work Breakdown Structure approach
- Devise tasks and milestones just enough to represent the relevant project steps

3.6.4 Project Budgeting for Engineering & Construction

- Create and assign a cost version to be used as the preliminary budget
- Deploy the items from the estimate within the project structure (WBS and network), for resources (material, labor, equipment, lump sum items) for each line item with their respective unit costs
- Basic Budget Functions
    - Original Budget
    - Budget Release
    - Budget Supplement
    - Budget Return
    - Budget Transfer
    - Budget Availability Check
    - Transfer Cost Plans into Budget

3.6.5 Project Planning for Engineering & Construction

- Devise a detailed schedule with a sequence of tasks of the work to perform
- Assign work centers as task force to network sub-activities
- Plan the labor of Procurement, equipment.
- Plan the purchase of subcontractor's services

- Release purchase requirements
- Creation of project reports
- Assign project budget

3.6.6 Project Forecast and Earned Value Management

- Determine the planned and actual POC, based on defined rules and POCs estimated manually or automatically
- Determine Earned Value and other KPIs like, cost performance index, and scheduling performance index
- Project Forecasting

3.6.7 Project Revenue Recognition for Project

- Execute Results Analysis based on defined methods and calculates
- Recognized Revenue
- Cost of Sales
- Work in Process
- Reserves (Unrealized Cost and Imminent Losses)
- Perform Settlement

3.6.7 Time Entry for Construction

- Entry of time per person
- Time sheet approval process
- Time and Material Project - Transfer to Costing Object (Projects, FI/CO)

3.6.8 Project Execution for Engineering & Construction

- RFQ's for Project Based Procurement
  - RFQ processing
  - Supplier / Vendor Selection processing
  - Convert PR's into PO's
- Purchase Order for Project-based Procurement

- Monitor Purchase Order for Projects

- Purchase Order for Material
  - Convert Assigned Purchase Requisition into Purchase Order
  - Approval and Release Purchase Orders
  - Performing Good Receipt of Material
- Entering Invoice with Material Purchase Order

- Executing the Payment Run

- Purchase Order for Service
  - Recoding service work via Service Entry Sheets
  - Enter invoice with the service Purchase Order
- Posting Manual Outgoing Payments

- Purchase Order with Down Payment Processing

- Purchase Order Creation for Material without Material Master Record Processing

- Project Delivery Commitments Reporting
- Project Related Procurement Reporting

3.7 SAP Business Intelligence

3.7.1 BI & BW Strategy

BI & BW value proposition

With SAP Business Objects business intelligence (BI) solutions, you have at your industry leading and historically proven BI user friendly applications that help you manage your Enterprise Reporting requirements. Whether your requirements are report formatting, ad-hoc query and analysis on relational or multi-dimensional data sources, or data visualizations and KPIs (Key Point Indicators), SAP Business Objects BI solutions provides a single BI platform that enables your business users to make effective data centric business decisions.

BI Metrics

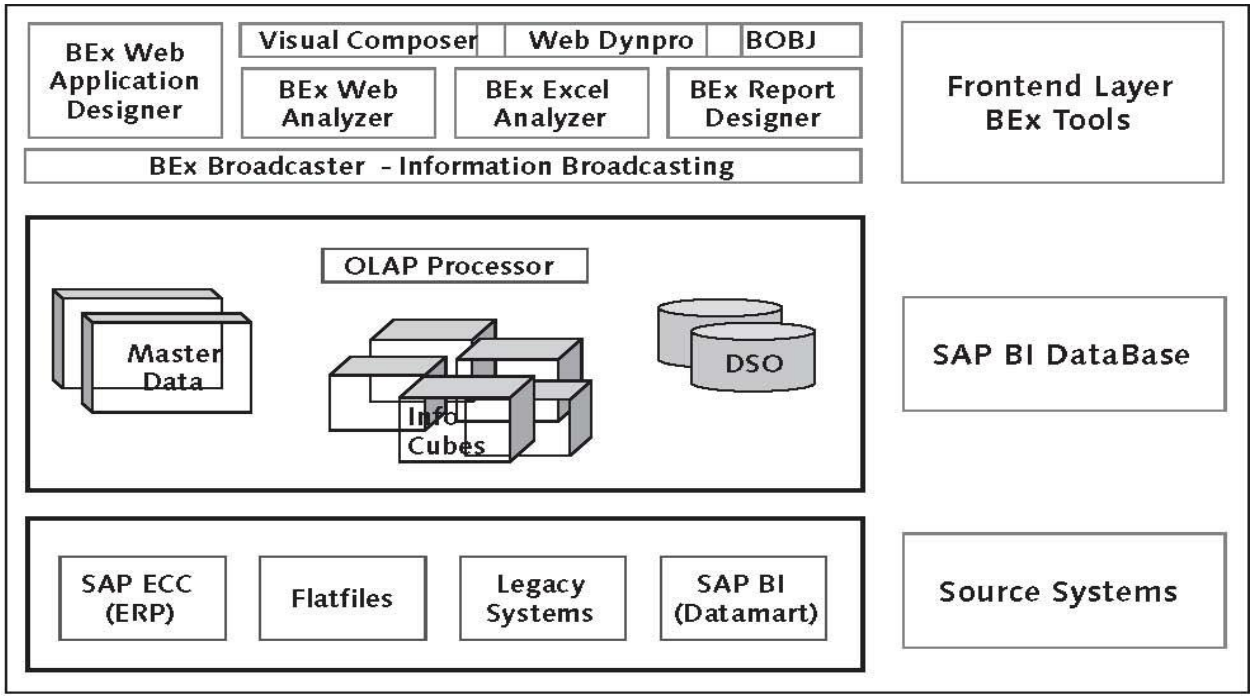
- Financial transactional outliers
- Ratio of Rush Orders to Replenishment Orders; while rush orders may be necessary from time to time, a heavy volume of rush orders increases spend, leading to cost overruns and shrinking margins. It's important to maintain a low ratio (1:8 to 1:10) in order to combat negative impacts. Once a suitable ratio is established, it's up to procurement, in collaboration with operations, to manage inventories to meet that ratio.
- vendor evaluation
- Inventory Turns; An indication of how many times a company's inventory is sold and replaced over a set period of time. Can be calculated by dividing the cost of goods sold (COGS) by the average dollar value of inventory on hand during a defined selling period (monthly, quarterly, annually).
- On-time Supplier Delivery Rate; The number of orders received from suppliers on or before the committed delivery date divided by the total number of orders received from suppliers over the same period of time, as a percentage.
- Cycle Time: Material Stocking; The average amount of time (hours) required to properly store received materials/goods, from the time they are received from the supplier until the time the goods are stored and recorded in inventory management tracking systems.
- Days on Hand: Finished Goods; The total value of finished goods in the company's inventory divided by the average value of finished goods sold in a single day.
- Breakdown Analysis; measures the total rate of equipment/ assets breakdowns
- Mean-Time Between repair; is a basic measure of the maintainability of repairable items. It represents the average time required to repair a failed component or device.
- Mean-Time Between Failure; is a measure of how reliable a hardware product or component is. For most components, the measure is typically in thousands or even tens of thousands of hours between failures. For example, a hard disk drive may have a mean time between failures of 300,000 hours.
- Current Ratio; Measures the ability of your organization to pay all of your debts over a given time period.
- Accounts Payable Turnover; Measures the rate at which your company pays off suppliers and other expenses.
- Working Capital; Measures your organization's financial health by analyzing readily available resources that could be used to meet any short-term obligations.
- Net Profit Margin; Measures how effective your business is at generating profit on each dollar of revenue you bring in.
- Vendor Expenses; This accounting KPI helps you track vendor expenses on an ongoing basis. Delve into individual vendor expenses and see the total for the time period of your choice.
- Measuring receivables more accurately and in more detail will help the company reduce

receivables and bad debt, and better predict which customers are likely to become problems.

3.7.2 BI & BW Architecture

Data Components

The graphic shows a physical and logical division between data staging in the source systems, data storage and management, and analysis.



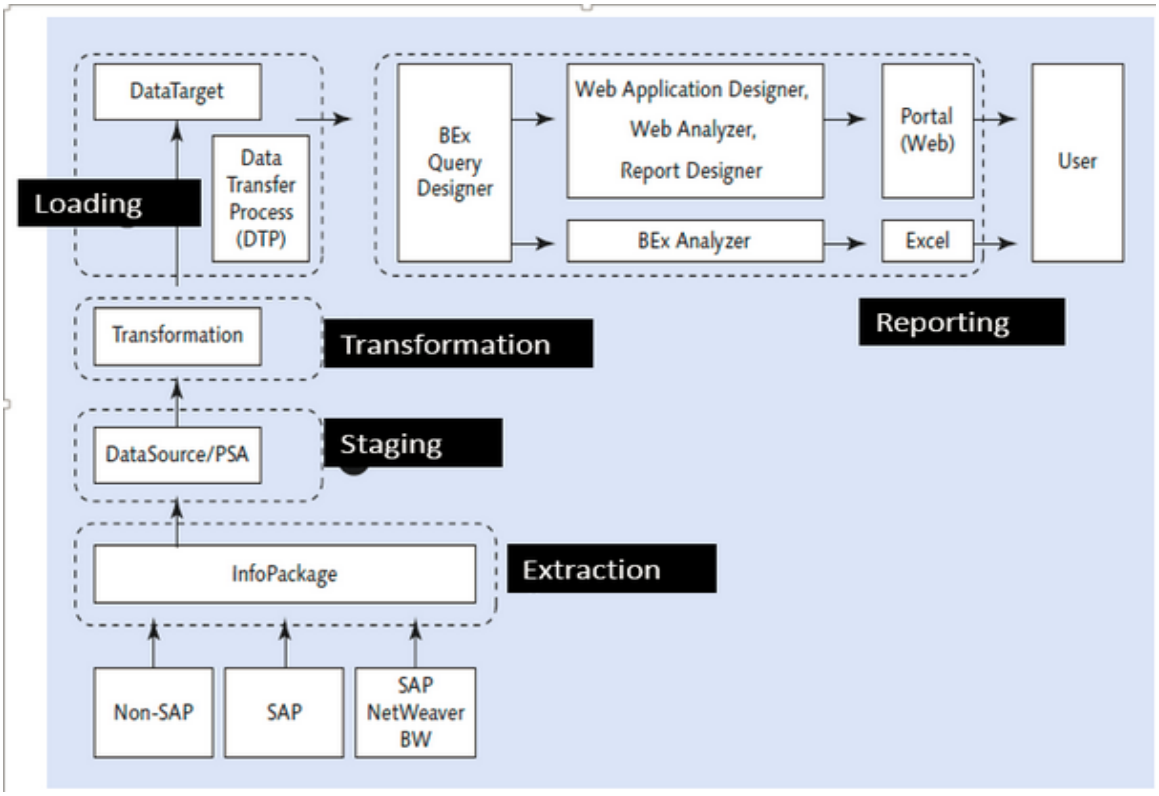
A source system is a system that provides the SAP BW system with data. SAP BW distinguishes between four kinds of source systems:

- Databases: SAP BW allows data to be loaded from external relational database systems. A DataSource is generated based on the external table structure, enabling table content to be loaded quickly and consistently into SAP BW.
- Non-SAP systems: A big advantage of SAP BW lies in the fact that is has an open architecture vis-a-vis external OLTP providers and other legacy systems. Particularly in a heterogeneous system landscape, it is thus possible to use SAP BW as a consolidated data basis for reporting that covers the entire organization. SAP delivers various tools which allow these interfaces to be implemented quickly and efficiently. These are looked at next.
- Data providers: As well being able to obtain data from a variety of available systems, SAP BW can also be supplied with target-orientated data from providers. For example, the organizations AC Nielsen US or Dun & Bradstreet provide market research data, which can be loaded into SAP BW for benchmarking and then measured against your own operative

data. The interface for the transfer of data supplied by the data providers is already available in SAP BW. This means the data import can run smoothly.

Information Management Component

The below figure shows the data flow through different layers of SAP BW system.



SAP NetWeaver BW offers flexible ways of integrating data from various sources. Depending on the data warehousing strategy data can be extracted from the source and load it into the SAP BW system, or directly access the data in the source, without storing it physically in the Enterprise Data Warehouse. (In this case the data is integrated virtually into the EDW. Sources for the EDW can be operational, relational datasets (for example in SAP systems), files or older systems.) Transformations allows us to run a technical cleanup and to consolidate the data.

Extraction and Loading:

Extraction and transfer processes to the initial layer in SAP BW as well as direct access to data are possible using various interfaces, depending on the origin and format of the data. SAP NetWeaver BW allows integration of both SAP and non-SAP data.

Transformation:

With transformations, data loaded within the SAP BW system using the specified interfaces is transferred from a source format to a target format in the data warehouse layers. The transformation allows us to consolidate, clean up and integrate the data, thus synchronizing it and allowing it to be evaluated.

This is done using rules that allow any degree of complexity when transforming the data. The functionality includes a 1:1 assignment of the data, the use of complex functions in formulas and custom programming of transformation rules.

Availability Requirements for Data in SAP NetWeaver BW:

It might be necessary to have data which is more up-do-date or less up-to-date, depending on the business issue.

If data is needed for the tactical decision-making procedure, data that is mostly up-to-date and granular is usually taken. The data can be staged in the SAP BW system based on its availability and loaded in minute intervals. A permanently active SAP background processing job is used here. This job is controlled by a special daemon. This data staging procedure is called real-time data acquisition.

Loading:

By loading the data into a data warehouse, performance in the source system is not affected during data analysis. However, the load processes require administrative time and effort.

Business Content:

Business Content is a pre-configured set of role and task-relevant information models based on consistent metadata in the SAP Business Information Warehouse. Business Content provides selected roles within a company with the information they need to carry out their tasks.

This information model includes integral roles, workbooks, queries, InfoSources, InfoCubes, DSO objects, key figures, characteristics, update rules, and extractors for SAP R/3, mySAP.com Business Applications, and for other selection applications.

4. Project Approach

Our proposal is based upon our current understanding of RAK PSD business needs as discussed in our meetings. This section describes the proposed approach for the solution, and the project timeline.

4.1 Project High Level Timeline

Following SAP Activate methodology and based on our understanding of your business requirements, the initial project duration fare detailed below:

Detailed Project Plan	M1				M2				M3					M4				M5				M6					M7				M8				M9				
Module	W 1	W 2	W 3	W 4	W 5	W 6	W 7	W 8	W 9	W 10	W 11	W 12	W 13	W 14	W 15	W 16	W 17	W 18	W 19	W 20	W 21	W 22	W 23	W 24	W 25	W 26	W 27	W 28	W 29	W 30	W 31	W 32	W 33	W 34	W 35	W 36	W 37	W 38	W 39
FICO, Fund Management, Group Consolidation, MM, WM, SD, PS PM, BI, Integration	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39

Detailed Project Plan	M10				M11				M12				
Module	W 40	W 41	W 42	W 43	W 44	W 45	W 46	W 47	W 48	W 49	W 50	W 51	W 52
FICO, Fund Management, Group Consolidation, MM, WM, SD, PS PM, BI, Integration	40	41	42	43	44	45	46	47	48	49	50	51	52

Prepare
Explore
Realize
Deploy
Run

- ✓ Based on PSD RAK Business Readiness and adhering to SAP Best Practices; Project plan duration could be reduced from twelve (12) months to nine (9) Months.
- ✓ Run Phase (hyper care) shall be six (6) months.
- ✓ This schedule does not take into account all work required for data cleansing, legacy data extraction, security administration for RAK PSD network, and PC's.

Project Effort Utilization

% efforts by customer role & deployment phase	Prepare	Explore	Realize	Deploy	Run
Customer project manager	100%	80%	80%	100%	100%
Customer Business Owner	5%	50%	30%	30%	100%
Customer Key User	0%	50%	80%	90%	100%
Customer End User	0%	0%	50%	90%	100%

% efforts by Edraky role & deployment phase	Prepare	Explore	Realize	Deploy	Run
Edraky project manager	100%	80% on site 20% offshore	20% on site 80% offshore	100%	100%
Edraky Functional Consultant	10%	80% on site 20% offshore	20% on site 80% offshore	100%	100%

4.2 Specific Developments (WRICEF)

Project Specific developments are classified into Workflows (W), Customized Reports (R), Interfaces (I), Conversions (C), Enhancements (E) and Customized Forms (F). This is denoted as development.

The in scope WRICEF list will contain (30) customized reports, customized forms, (20) enhancements, (40) conversions, (10) interface, and workflows. Workflows & Forms shall be developed to cover all Business Requirements & Needs. The detailed list to be developed mutually in the Explore Phase.

4.3 Project Methodology

The project will be managed and executed using the Activate methodology and toolset. The methodology was developed specifically to implement solutions based upon SAP Best Practices.

Based upon years of experience working with a long list of leading companies, SAP has developed proven best practices that help companies maintain competitive advantage. SAP has translated the best practices into preconfigured business processes.

SAP Activate Methodology Phases

1. **Prepare phase**

The project charter is the main deliverable in this phase which includes the high level plan, roles and responsibilities for all project members, etc. Finally, general project preparation, such as staffing, governance, and reporting requirements, is also carried out in this phase.

Deliverables

- Initial Project Plan
- Project Charter
- Sandbox System Setup.
- QG1 – Run Quality Gate Prepare – to –Explore.

2. **Explore phase**

The to-be design of the SAP solution is defined and documented in the “Explore” phase. Functional gaps are documented, prioritized and validated as well. Ideally those “Fit to standard Workshops” are performed with the help of pre-configured sandbox systems which represent SAP’s Best Practice solutions. In case of a system conversion, existing custom code needs to be analysed with

respect to SAP readiness.

On the technical layer, a technical design of the to-be solution needs to be designed and documented. This is the pre-condition to a technical setup of sandbox and the development environment. By the end of the "Explore" phase, all technical and functional aspects of the implementation project (for example, solution scoping and content activation) are fully planned, documented in detail, and ready to be executed, also all the gaps are listed and prioritized in the backlog.

Deliverables

- GAP Validation.
- Design Review.
- DEV Setup.
- Business Process Blueprint Document (Process Mapping with ERP and Gap analysis document).
- Backlog Document
- Q2 – Run Quality Gate Explore-to-Realize

3. Realize phase

In the "Realize" phase, supporting systems are converted according to Best Practices and the implementation plan. Custom code is adjusted for SAP Platform.

Application and analytics functions are implemented, configured, and tested. Integration validation supports this phase. Finally, Key user and end-user training taking into consideration that we use Train the Trainer methodology, including project-specific training material and team setup, is prepared as required. Key users are enabled to perform end-user training.

Deliverables

- Configuration
- Key User Training
- Integration Validation.
- Test Preparation.
- Test Execution.
- Unit and integration test scripts
- User acceptance testing test scripts
- QAS Setup.
- Cutover Preparation.
- End User Training.
- Q3 – Run Quality Gate Realize – to – Deploy
- Security & Control Specifications
- Hardware and networking plan
- User Manual for all modules (All user guides)
- Full configuration document for all modules

- Custom development functional specifications document
- Custom development technical specification document
- Data migration strategy document
- Installation procedure document
- System administrators' routine maintenance procedure document

4. Deploy phase

The purpose of this phase is to finalize the readiness for SAP and business processes for production go-live. This includes all the Cut-Over activities, and finalizing the IT infrastructure and operations. Finally, and depending on the scenario, the productive instance of SAP is implemented or converted on the Go-Live weekend.

Deliverables

- Production Cutover.
- Cutover strategy document
- Operations Readiness.
- QG4 – Run Quality Gate Deploy – to –Run.

5. Run phase

After going live, SAP is available for business users to log in and for productive use. IT operations are further optimized (for example, bug fixing, system availability, and performance) with the help of the project team and SAP. This phase is referred to as "hyper care" and occurs before operational responsibility is fully transferred to the production support team.

Deliverables

- Hyper Care support
- Handover to support Organization
- Closing
- QG5-Project Closing

4.4 Project Quality Assurance

Edraky Quality Assurance Team

Edraky has a QA team; dedicated to support and audit the implementation team throughout the project phases, starting from prepare till run phase.

Our support activities include the following:

- Provide all Project Documents; SAP Best Practice Standard Templates.
- Briefing Sessions for Implementation Methodology. To be well communicated with key users.
- Project Phase Closure Activities Through SAP Quality Gate.

Our audit activities include the following:

- Verify all Project Documents Quality – at Phase Closure
- Customer Survey; Verify Team Technical and Business Qualifications Based on the Customer Expectation

Quality Gates

It's the Formal Way to check the project key deliverables, it gives you a quick view over the project and finally it provides the ability to the delivery manager to check the PM capabilities.

It is:

- A checklist document that keep you updated on the Project Track
- Overview on the project Planned deliverables
- Formal way for the customer phase approval / closure

It is NOT:

- A guarantee that we won't have any future risks
- A detailed content review of all key deliverables of the project

4.5 Post go-live Support

Edraky will provide handholding an onsite/ offshore support for Six months of hyper care; based on RAK PSD business needs and requirements. And a one year of SLA.

This service covers functional incident resolution on the SAP modules under the scope. In this context a functional incident is any functional problem that prevents the execution SAP business process in the scoped modules. Functional incidents can be:

- Service not available
- Application bug /Transaction error
- Issues arising due to lack of knowledge from user side
- Modifications to existing configuration
- Modifications to existing developments
- New configurations
- New developments

Considering that all communications will go through single point of contact (RAK PSD representative) to ensure smooth operation, validity, and consistency of requirements.

Resolution of incidents stemming from product defects covered by the manufacturer's guarantee is excluded from this service.

4.5.1 Service Desk Tool

Edraky's SAP Solution Manager will be used

Priority	Category	Initial Response Time
P1 – Very High	Entire system or critical component of the Application is unavailable or at risk of becoming unavailable, to such an extent that **client** is not able to conduct day-to-day business activities**.** **Example:** Breakdown of Production server Disk full/ Table space extensions RFC failures	2 – 4 Hours
P2 – High	Critical part of System unavailable or at risk of becoming unavailable or System Incident / Problem with no workaround seriously impacting or at risk of seriously impacting **Customer***'s* ability to conduct day-to-day business activities. Example: Goods ready for dispatch, but unable to do PGI/billing. Not able to print bar code/ outbound document printouts	8 – 24 Hours

P3 – Medium	Non-critical part of System unavailable or at risk of becoming unavailable or System Incident causing or at risk of causing inconvenience and/or increased work effort but not seriously impacting **client'**s ability to conduct day-to-day business activities. Example: User getting an error while executing a transaction Authorization issues Small configuration changes such as tax code creation, new output type etc. Minor changes to existing reports/ layouts without adding any new features.	24 -48 Hours
P4 – Low	Incident with System that is causing or at risk of causing a minimal amount of increased work effort but is not impacting **client**'s ability to conduct day-to-day business activities.	48 - 60 Hours

4.5.2 Support Procedures

Communication channels

The communication channels can be through the below:

- Edraky's SAP Solution Manager
- E-mail
- Mobile

However, all service requests should be documented on Edraky's SAP Solution Manager since it guarantees that all documentation will be available to all stakeholders involved in the message handling.

These communication channels will be manned during RAK PSD's working days/hours.

Edraky will provide 24x7 Hotline number for business critical issues (Very High Priority issues only) after an agreement with user on severity/business Impact.

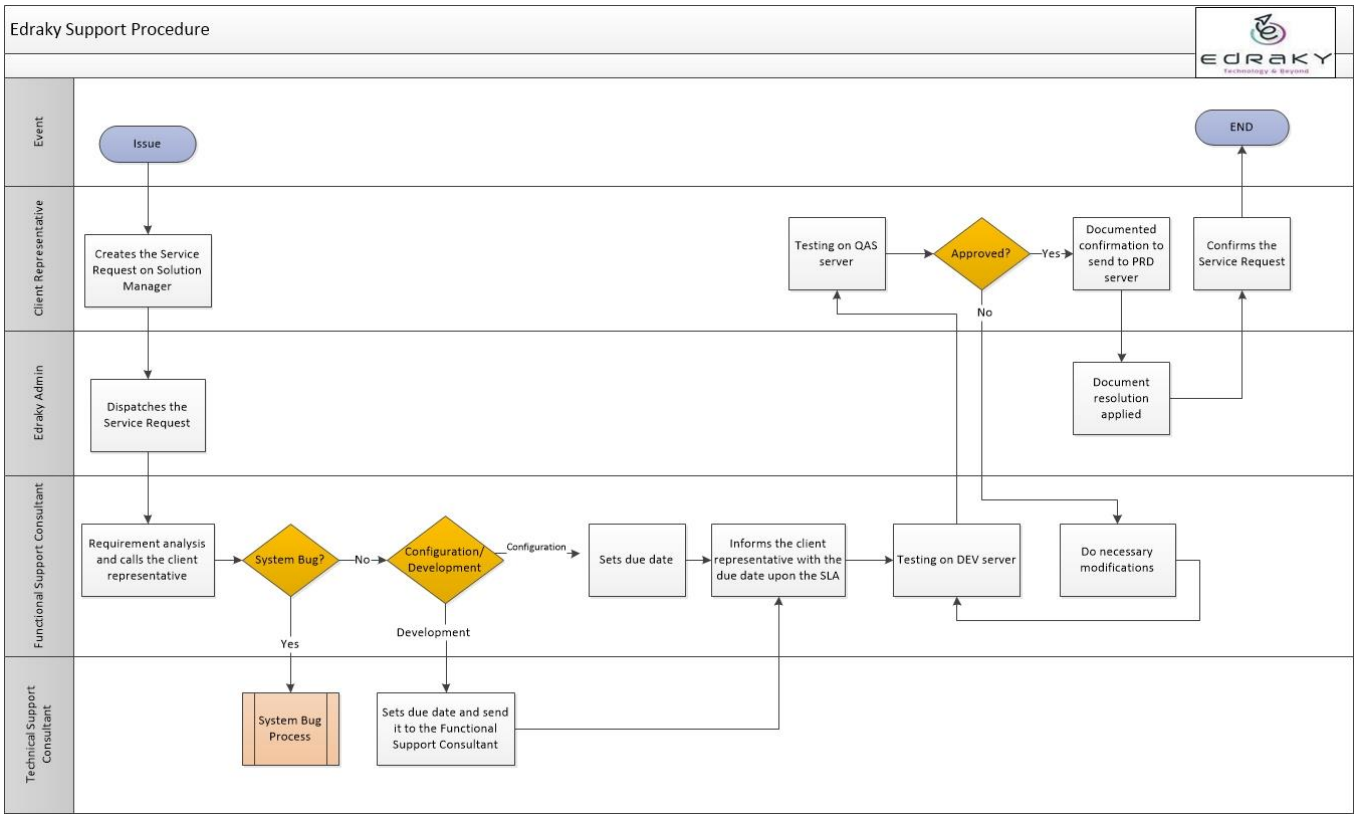
Typical Resource Deployment on Support Requests (SLA)

The resource deployment times, specified in this agreement are a target level for achievement during the period of the contract and will be used as the basis for defining and redefining the levels.

4.5.3 Support Mechanism

Edraky SAP Solution Manager would be accessed from Client side, wherein a confirmation mail is sent to the Client representative and Edraky Admin automatically after saving the ticket. Then, after each update in the ticket, both the Client Representative and the assigned consultant receive a notification E-mail.

Support Process

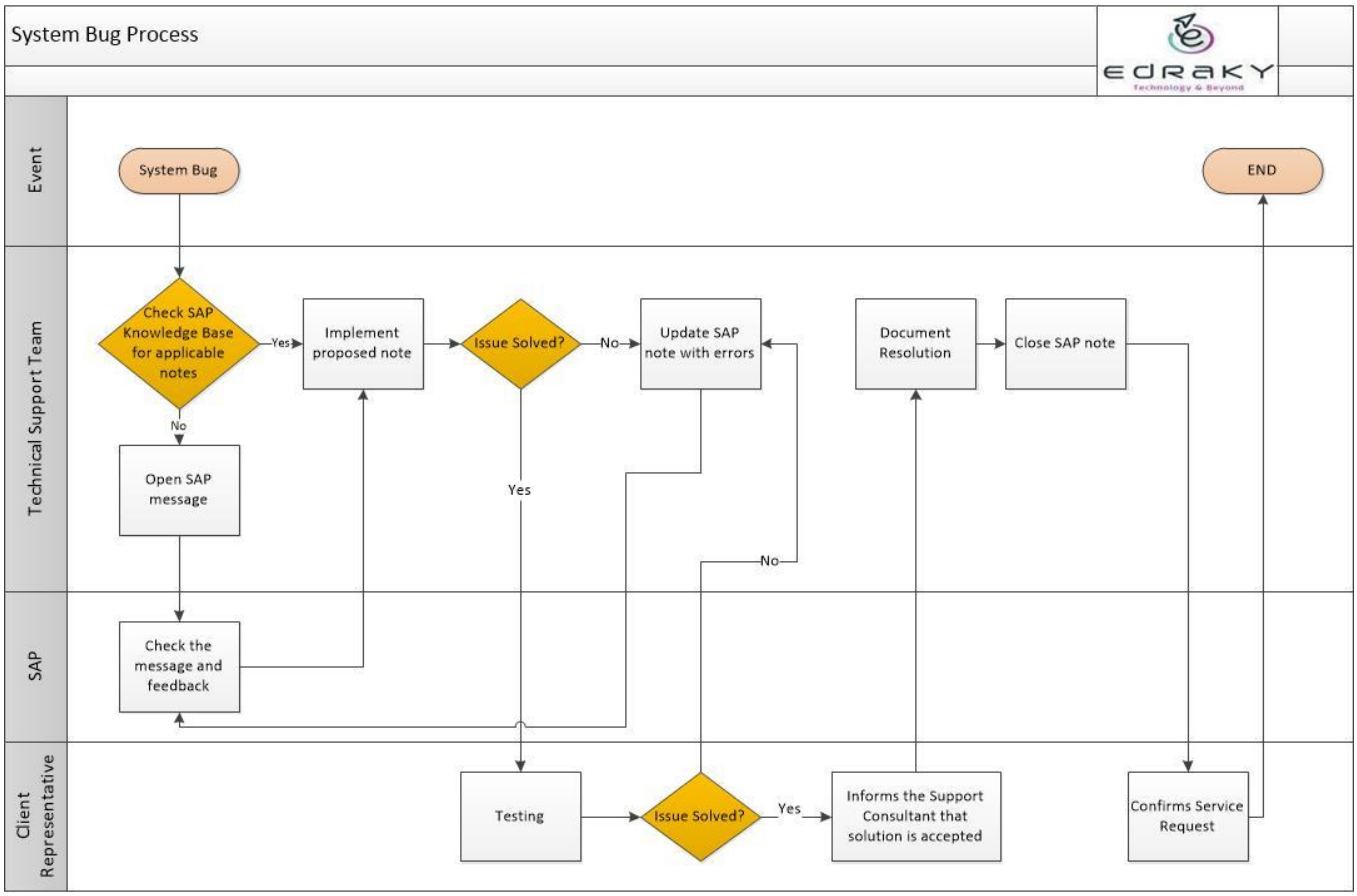


Process in detail

- Client Representative or identified End Users will log the Service Request on Edraky Solution Manager using the provided credentials.
- Edraky Admin receives the Service Request and dispatches it to the relevant consultant in charge.
- Support Consultant checks the Service Request and calls the customer informing him that the ticket is received and discuss any clarification required to start working on theService Request, then update it on the Solution Manager.
- In case of system bug, the system Bug process will take place.

- Service Request requirements are studied to identify what sort of work is needed, like, enhancement, configuration, SAP development issue, ABAP change, lack of training, user error.
- Edraky's Account Manager will identify the right priority for the Service Request in line with the agreed Service Level Agreement.
- Due date is set by Edraky's assigned consultant on the Solution Manager.
- The necessary change or fix is applied by Edraky Support Consultant in the Development Server.
- Unit testing takes place on the Development server by Edraky Support Consultant.
- Upon successful resolution of the issue, the changes would be transported to the test system (Quality Server) for both Edraky Support Consultant and Client representative testing.
- In case of solution issues, the Client Representative will inform the Support Consultant with the needed modifications.
- Support Consultant implements the necessary corrective actions, transports to Quality server for Client testing.
- The transports would then be moved to Production upon acceptance of the solution by the Client Representative.
- Client Representative would validate whether the issue has been resolved on Production server correctly before marking the issue as closed.
- Edraky Support Consultant will develop the deliverable documentation (as agreed) along with solution and upload it in Edraky Solution Manager so that details are available to the Client Representative.
- Upon acceptance, the Client Representative confirms the Service Request.

System Bug Process



4.5.4 Project Monitoring

The project progress shall be monitored through periodically agreed meetings and periodic reports.

Periodic reports include:

- Weekly tickets tracking report.
- Monthly status review report.
- Monthly developments report.
- Quarterly evaluation report.
- Yearly evaluation report

Regular meetings:

- Monthly meetings between Edraky's Support Manager, Account Manager and Client Representatives.
- Quarterly meetings between Edraky's Service Delivery Manager, Support Manager, Account Manager and the required team members from the Client side to review the project status.

All meetings will be documented in the minutes of meeting document which will be shared with the attendees.

Additional meetings can be scheduled upon request.

4.5.5 Performance Measurement and Reporting

SLA shall be measured on a monthly basis. Edraky Account Manager shall submit to client in the first week of the calendar month, a performance report, which shall document Edraky performance with respect to the service levels during the previous month. These reports will form the basis for the quarterly reviews for the service level metrics.

4.6 RAK PSD's activities by project phases

1. Prepare and Explore

Project Manager:

- Review project plans (Charter, schedule …) and activities with SAP Project manager.
- Communicate project status to Executive Project Sponsor and Project Team
- Manage customer project resources
- Manage issue resolution process
- Review training/organizational change management guide
- Coordinate technical environment set up
- Project kickoff

Technical Team Members:

- Participate in technical environment planning
- Extract data from legacy systems if we need to use these data in analytics.

Business Team Representatives:

- Data Cleansing
- Data preparation

2. Realize

Project Manager:

- Monitor Project progress with Edraky Project manager
- Communicate project status to Executive Project Sponsor and Project Team
- Manage RAK PSD project resources
- Identify and map users to training courses
- Work with Edraky Project Manager to manage issue resolution
- Work with Edraky Project Manager to develop detailed Integration Test Plan
- Work with Edraky Project Manager to develop detailed internal Support Plan
- Work with Edraky Project Manager to develop Detailed Cutover Plan

Business Team Representatives:

- Work with Edraky consulting team on testing data load programs and procedures
- Perform Business Processes Unit Testing and approval
- Validate reports and forms
- Document RAK PSD specific business process procedures
- Assign RAK PSD users to authorization profiles
- Work with Edraky consultants to develop integration test plans
- Test and document RAK PSD Business Processes

Technical Team Members:

- System administration tasks
- Database administration tasks
- Network administration tasks
- Operating System administration tasks
- Authorization administration tasks
- Work with Technical consultant on installation and test of Production Environments

Organizational Change Management Responsible:

- Communications
- Impact mapping
- Transition planning

3. Deploy

Project Manager:

- Monitor Project progress with Edraky Project manager
- Communicate project status to Project Sponsor and Project Team
- Manage RAK PSD project resources
- Work with Edraky Project Manager to manage issue resolution
- Work with Edraky Project Manager on cutover
- Rollout out and monitor end-user training
- Coordinate Help Desk setup
- Manage cutover procedures and sign off

Business Team Representatives

- Work with Edraky consultants on preparing and executing cutover plan (functional)
- Support users at Go-live

Technical Team Members:

- System administration tasks
- Database administration tasks
- Network administration tasks
- Operating System administration tasks
- Authorization administration tasks
- Work with Technical consultant on Production Environment readiness

4. Run

Project Manager:

- Manage RAK PSD project resources
- Manage issue resolution
- Manage transition to ongoing support plan

Business Team Representatives:

- Support users at Go-live

Technical Team Members:

- System administration tasks
- Database administration tasks
- Network administration tasks
- Operating System administration tasks
- Authorization administration tasks

4.7 Project Scope & Assumptions

The scope of the project is defined in the Explore phase. It is a vital requirement that the project is restricted to this scope. Any development outside this agreed scope will threaten the project.

As the project progresses, the necessity may arise to change the scope of the project. Any change will be governed by scope control procedures. These are intended to reduce the impact of the work on the project teams and the schedule.

All scope change requests must be submitted to the project managers. They will investigate the change in terms of its impact on the project workload and schedule. If the change is outside the scope of the project, the costs will also be determined.

Input from Edraky consultants and RAK PSD business owners will be required to determine these costs and impacts. The project managers will then present their findings to the project sponsor who will approve the change or reject it.

4.7.1 Change to Services

Both parties may submit requests for changes in writing during the term of the contract.

If RAK PSD submits a change request, Edraky will reply with an estimate of the impact of the change on the existing contractual agreement within a suitable period of time after receiving the request. Edraky will not refuse to implement a change request without objective cause, provided that RAK PSD undertakes to cover any additional costs that may be caused by the change request. Objective cause is in particular given if Edraky believes that the change will jeopardize the success of a project. If a change request by RAK PSD requires extensive tests, Edraky will be entitled to demand payment of a suitable fee for carrying out these tests.

If Edraky submits a change request, it will include an estimate of the impact of the change on the existing contractual agreement with its request. RAK PSD must inform Edraky in writing of its acceptance or refusal of the change within 10 working days of receiving Edraky's change request. Failure to react will be deemed to be a refusal.

RAK PSD may refuse change requests by Edraky without providing its reasons, in which case, however, RAK PSD will bear sole responsibility for any consequences of the refusal.

If the change request is accepted by both parties in writing, the estimate regarding the impact of the change on the existing contractual agreement prepared by Edraky will automatically become an integral part of the contract and RAK PSD will be deemed to have accepted the additional costs caused by the change.

4.7.2 Project Assumptions

The following assumptions were made when developing the project plan and Price estimate. Any change in those assumptions may have an impact on the estimates and the schedule.

Critical Success Factors

Our experience demonstrates that the following critical success factors must be met for a successful implementation:

- **Ownership:** Visible and ongoing ownership of the project by management is crucial. Senior management must be active and available participants in the process to ensure that effective decisions are made.

- **Acceptance:** The transition to SAP software will involve change in the work environment of both users and systems personnel. Building commitment to this change is an important responsibility of both the executive sponsor and the project team. Solid acceptance and commitment require time. Strong organizational change management, communications, and a consistent training strategy throughout the entire project are essential.

- **Scope control:** This document clearly defines and communicates the boundaries and objectives of the implementation. No doubt regarding the goals the project must achieve and the commitment required to be successful can exist. A rigorous scope management process is required because any development outside the agreed scope might threaten the project in terms of costs and schedule.

- **Talent**: The quality of the project team affects the quality of the implemented solution. The goal for RAK PSD must be to dedicate the best, most talented resources of the organization to the SAP implementation. The resources must be empowered and authorized to resolve key issues in a timely manner and possess deep knowledge of internal business processes and business objectives at RAK PSD

- Expected benefits, project objectives, and project constraints are clearly stated and communicated to all stakeholders.
- Timely resolution of pending issues to prevent delays in the implementation plan.
- Clearly stated project standards to which all participants adhere.

General Assumptions

The proposal and the estimations are based on following assumptions:

- RAK PSD will use SAP standard functionality for the mentioned Scope of work
- Go-live scope is finally fixed at the end of blueprint phase.
- Project team gets access to SAP development, Quality and Production systems of RAK PSD
- Project team gets access to documentations of RAK PSD’ s SAP system.

- All involved parties will be available as per the agreed plan and upon request if needed.
- The project will focus on implementing those business processes and converting those data items listed the Scope of work. Processes not listed will be considered out of scope for the project defined in this proposal.
- Additional processes that are outside the scope of this proposal need to be requested through the change order process and will be included once approved and billed on a time and material basis
- RAK PSD is responsible for procuring and installing the appropriate hardware on a schedule that supports the proposed schedule in the technical proposal
- The project has sponsorship from RAK PSD senior management. RAK PSD will identify an executive to act as Executive Project Sponsor throughout the project. The Executive Project Sponsor will monitor the project progress, and will be available to act as decision maker, ensuring 24-hour turnaround on policy decisions
- RAK PSD project team will be assigned to the project in accordance with later communicated schedule. The assigned team members will have higher priorities for the project tasks than their regular duties. So that they will be able to accomplish their assigned tasks during the project life cycle
- RAK PSD is responsible for testing and validating the delivered business processes
- RAK PSD will provide a working environment and facilities adequate for Edraky to perform their assigned duties at or away from RAK PSD site. This includes a suitable environment of working (ex: adequate conference rooms, access to the network at RAK PSD premises, project team shared drives, e-mail, telephone, and analog phone line or internet to access SAP systems)
- This proposal assumes RAK PSD will be responsible for rolling out end-user training.
- The project will be managed and executed using the SAP implementation methodology and toolset, Activate for Packaged Solutions. This methodology was developed based on the packaged solution offering. The methodology toolset includes a project plan, step-by-step guide and project accelerators that are tailored to implementing SAP Best Practices in phases as outlined in the implementation approach section
- Any consulting resources required subsequent to go-live for this project, will be available and billed on a time and materials basis
- RAK PSD data to be loaded is accurate, up to date and available
- Edraky Consultants are not responsible for supporting other implementation methodologies or toolsets
- This proposal assumes RAK PSD will be responsible for rolling out end-user training.
- The project will be managed and executed using the SAP implementation methodology and toolset, Activate for Packaged Solutions. This methodology was developed based on the packaged solution offering. The methodology toolset includes a project plan, step-by-step guide and project accelerators that are tailored to implementing SAP Best Practices in phases as outlined in the implementation approach section
- Any consulting resources required subsequent to go-live for this project, will be available and billed on a time and materials basis
- RAK PSD data to be loaded is accurate, up to date and available

- Edraky Consultants are not responsible for supporting other implementation methodologies or toolsets

4.7.3 Out of Scope

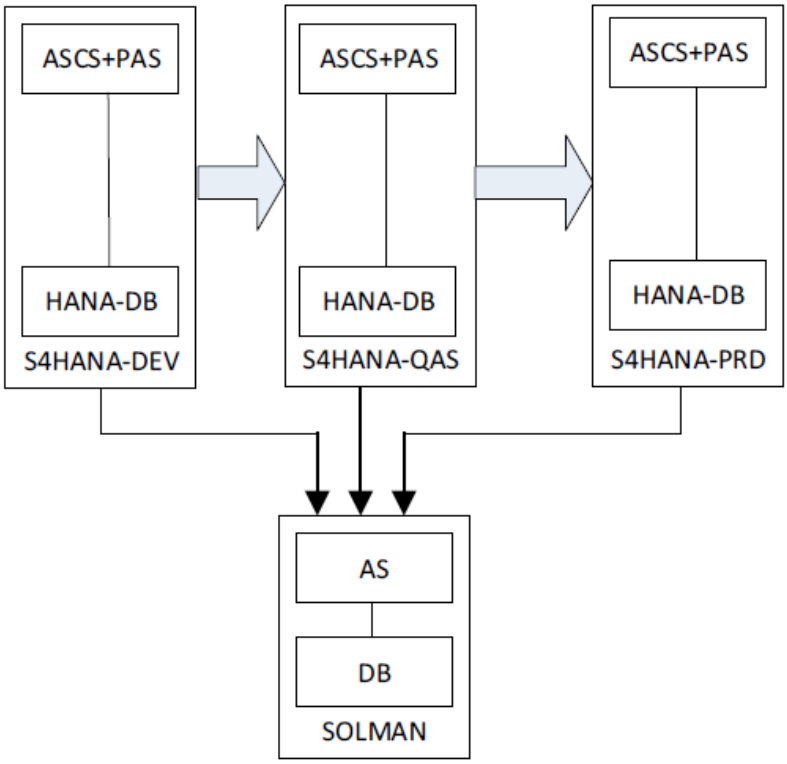
- All data collection, cleansing, and data entry.
- Hiring RAK PSD's work team.
- Installing or upgrading software, hardware, network infrastructure other than SAP.
- Planning the infrastructure or developing any other products other than SAP.
- Copying and archiving.
- In common, any deliverable that has NOT been mentioned herein this agreement or mentioned in the scope statement will be deemed out-of-scope.

5. SAP ERP System Technical Landscape Design [Hardware Components & Requirements]

5.1 Global Design

- ASCSis anSAP instance which contains the messageserverandenqueueservice, The ASCS isthe first contact fortheenduser requests(SAP GUIrequests /Http requests).
- PAS is the first installed SAP instance which contains the different work processes of the SAP system (dialog, batch, spool ……, etc.)
- Dialog instance is the same as PAS but installed on a different host other than the ASCS host

- All the system is connected to the SAP Solution manager to have a single source of truth of the system components of all the system within the landscape



5.2 Landscape Components

ERP S4/HANA

ERP willcontain the daily transactionaldata for the business“OLTP”

SOLMAN (solution manager)

SAP SolutionManager is the standard platformfor Application LifecycleManagement (ALM), and plays a decisive role withintheALM tools.

Besides providingSAP functionalityitself, SAP Solution Manager integratestheothertoolsto ensure a comprehensive approach.

It enablesthecentral accessto all requiredfunctions and central availabilityofall requiredinformation. Additionally, SAP SolutionManagerfacilitatestheefficient collaborationbetweenyour companyand theSAP support organizationto optimize the value of your support engagement.

SAP-router

SAP-router is asoftware application that providesa remoteconnectionbetweenour customer's network andSAP. Thisremote connection enables:

- Secure unattended root cause analysisofincidents
- Secure deliveryof SAPsupport services

SAP-router ismappedtoafixedrealIPwhich willbe registeredat SAP, inour design wewill install theSAP-routeron the Solutionmanager'server.

ADS

ADS is partofthe SAP NetWeaver installation,usagetype ASJava. Adobedocumentservicesallow SAP applications (eitherJavaorABAP) to takeadvantageofthe rangeofcapabilitiesin Adobe Acrobat Professional. Forexample,enhance thedocument handling capabilities ofSAP NetWeaver Application Server.

5.3 Detailed Design

For SAPusuallywe have3systemsDevelopment,Quality andProduction. Eachsystem has itsown type of users and unique usage.

Development system

- The development systemisusedby SAPexperts (SAPconsultants).
- The system isusedtodevelop thesystem tomeetthecustomer's businessrequirements.Alsothe systemis used forthe unittestofeachmodule.

Quality system

- The Quality systemis usedby SAPexperts (SAP consultants) alongsidewith the Key users.
- The Quality system isused for the integrationtest between the different modules,thesystemmaycontain sampleofthemaster data.
- The Quality system is used for thetraining of keyuserswhich isdelivered by theconsultants.
- The Quality systemis usedfor the trainingof theendusers which isdeliveredbythe Key users.

Production system

The Production systemis used by bothKeyandendusers for thedaily businesstransaction,afterthe GO-Livephase.

Application server and DB HW specs

Solution	OS	Database	vCPU	MEM	Disk Space Total
ERP DEV App	LINUX	-	8	24	350
ERP DEV DB	LINUX	HANA	40	256	1100
ERP QAS	LINUX	-	8	32	350
ERP QAS DB	LINUX	HANA	40	512	1700
ERP PRD App1	LINUX	-	4	16	128
ERP PRD App2	LINUX		4	16	128
ERP PRD App3	LINUX		8	32	300
ERP PRD App4	LINUX		8	32	300
ERP PRD DB	LINUX	HANA	64	512	2500
ERP PRD DB DR (HSR)	LINUX	HANA	64	512	2500
Solman PRD	LINUX	HANA	40	256	1100
Solman PRD	LINUX	-	8	32	350
Solman PRD	LINUX	-	8	32	350
Solman DEV	LINUX	HANA	40	256	1200
Solman DEV	LINUX	-	8	32	350
Solman DEV	LINUX	-	8	32	350
FIORI DEV	LINUX		8	32	350
	LINUX	Sybase	8	32	500
FIORI QAS	LINUX		8	32	350
	LINUX	Sybase	8	32	800
FIORI PRD App1	LINUX		8	32	250
FIORI PRD App2			8	32	250
FIORI PRD DB	LINUX	Sybase	16	64	1200
FIORI PRD DB (SRS)	LINUX	Sybase	16	64	1200
SAP Webdispatcher DEV	LINUX		4	16	200
SAP Webdispatcher PRD	LINUX		4	16	300
SAP Router	Windows		4	16	300
Managed Server/RDS	Windows		4	16	500

6. Integration Scope of Work

#	Application Name	Proposed Integration Approach
1	Current government ERP SAP system	Bi directional or one-way integration is supported. Cross company transactions that are generated from other RAK ECC systems and related to PSD should make postings in PSD system
2	Revenue generation system	Revenue generation system will be integrated with the PSD S4Hana system to post revenues and collections
3	Fleet management & fuel management system	Bi directional or one way integration is supported
4	SAP HCM & Payroll engine	Bi directional integration is supported.
5	Full Integration with FileNet	IBM FileNet Application Connector for SAP R/3 (ACSAP R/3) is a modular enterprise content management (ECM) solution that seamlessly integrates with mySAP applications through the SAP ArchiveLink and Knowledge Provider (KPro) interfaces. It provides outbound archiving and retrieval for SAP-generated business documents, SAP database data and reports, as well as inbound archiving and retrieval for documents generated outside of SAP
6	Integration with RAK EGA exchange email	Bi-directional integration or one way integration through web services

7	Integration with RAK EGA SMS gateway	Bi-directional integration or one way integration through web services
8	Integration to our RAK payment gateway	Bi-directional integration or one-way integration through web services

7. Knowledge Transfer & Training Approach

The purpose of the training Plan is to define, develop, and finalize RAK PSD key system users training.

7.1 Training Approach "Train the Trainer"

Edraky's training approach is to conduct project team training for key system users to enable them to acquire knowledge of the SAP system's functional and technical workings and to be able to pass it on to end system users. This training enables the key system users to match their knowledge requirements to the SAP system's functions.

The instructors (Edraky Trainers) who will train RAK PSD key users are Edraky SAP functional and technical consultants. These consultants are experienced trainers who have implementation experience of SAP solutions in different industries.

7.2 Training Plan

SAP Sample Training Project Plan

Sample Training Project Plan	Start Date	End Date	Resources	Dependencies
Prepare				
Agree on Training Resource Approach				
Secure Contract for Training Services				
Create Learning and Deployment Strategy - Outline				
Identify End User Training Objectives, Approach, Needs				
Identify Team Roles and Activities				

Identify Critical Success Factors, Risks, Timeline
Create Project Team Learning Strategy - Begin to Execute Training
Develop Training Project Plan
Develop preliminary course development and document templates
Preliminary High Level Learning Needs Assessment
Develop Assessment Questionnaire
Identify Potential End Users by Functional Process/Location
Identify QA and User Support Audiences
Develop Preliminary High Level Learning Needs Assessment
Staff the Training Development Team
Coordinate with Organizational Change Management

Explore

Refine Training Project Plan
Review Project Timeline
Identify Key Deliverables
Identify Key Linkages/Integration Points
Project Team Learning Strategy - Continue to Execute Training
Finalize End User Training Learning and Deployment Strategy
Create Final End User Training Learning and Deployment Strategy document
Create Final End User Training Learning and Deployment Strategy presentation
Sign-off of Final End User Training Learning and Deployment Strategy
Develop Assessment Questionnaire
Conduct Interviews
Coordinate with Organizational Change Management
Incorporate Findings from Assessments
Identify Potential End Users by Functional Process/Location
Identify QA and User Support Audiences
Finalize Detailed Learning Needs Analysis
Create detailed report
Create executive presentation
Sign-off for Detailed Learning Needs Analysis
Media and Infrastructure Assessment
Assess Potential Development and Delivery Media
Set up SAP Training Environments with Migration and Refresh Schedules
Training Infrastructure Checklist

Inventory Available Training Development Tools and Software

Finalize Development Tools

Determine Delivery Media

Identify Instructor Led Training Needs

Identify Facilitated Online Training Needs

Identify Self-paced Training Needs

Identify Functional Team Workshop Training Needs

Determine Curricula Structure and Design/Development Process

Establish Curricula Structure for Overview and Business Process Content

Establish Curricula Structure for Task Training Content

Identify Performance Support Mechanism and Content

Outline Courseware Design and Development Process

End User Training Curriculum - Draft

Determine High Level Process Needs

Identify Subject Matter Experts/Super Users for Development

Determine and Communicate Subject Matter Experts/Super Users Time Requirements for Development

Interview Business Team Leads

Identify Potential End User Audience by Business Area

End User Training Curriculum - Draft

Install and Test SAP Productivity Pak Application

Preliminary Role Mapping to Security

Realize

Refine Training Project Plan

Project Team Learning Strategy - Continue to Execute Training

Trainer Enrollment Plan

Finalize course development and document templates

Courseware Development Standards

Identify Standards for Syntax, Terminology, Naming Conventions, etc.

Identify Company-specific Standards

Identify SAP-specific Naming Conventions

Draft File Naming Conventions

Courseware Development Standards Document

Quality Review Plan for Courseware Development

Draft Quality Review Process for Courseware Development

Review Process with Education Team Members				
Create QA Forms				
Quality Assurance/Review Plan				
Incorporate Train-the-Trainer Approach				
Identify Program Team Roles and Responsibilities				
Document Requirements				
Trainer Onboarding Activities and Timeline				
Trainer Enrollment Plan				
Refine Project Plan				
Review Realization Phase Project Plan				
Revise/Adjust Dates and Tasks				
Complete Realization Phase Project Plan				
Adjust Learning Needs Analysis (if Required)				
Coordinate with Organizational Change Management				
Review BPML and Functional Scope Information				
Estimate Course Durations from Blueprint Draft				
Review Revised Curriculum with Each Functional Team				
Validate Revised Curriculum with Each Functional Team				
Create Preliminary Course Outlines and Curricula				
Review Course Outlines with Functional Teams				
Finalize Course Outlines & Sign-off by Functional Team				
Finalize Course Components				
Review Curriculum after Role Mapping				
Revise Curriculum based on Role Mapping				
Validate Curriculum with each Functional Team after Role Mapping				
Finalize Role Mapping to Security				
Finalize End User Training Curriculum				
Courseware Production and Distribution Pan				
Define Courseware Production and Distribution Options				
Identify Sources/Suppliers/Costs for Printing and Distribution				
Establish Timeline for Courseware Production & Distribution				
Trainer-the-Trainer Workshops				
Develop Train-the-Trainer Course				
Schedule Train-the-Trainer Course				
Conduct Train-the-Trainer Course				
Training Management				

Identify Training Coordinators			
Define Training Management Requirements and Processes			
Identify and Select Training Management/Scheduling Tools			
Validate LMS Capability for Scheduling, Registration, Tracking			
Onboard Training Coordinators			
Set Up Training Management/Scheduling Process			
Deploy Curriculum to LMS			
Deploy Course Content to LMS			
Deploy Assessments to LMS			
Deploy Course Evaluations to LMS			
Training Schedule			
Develop Preliminary Training Class Schedule			
Assign Users to Classes			
Review/Confirm Training Schedule with Key Stakeholders			
Publish Initial Training Schedule			
Develop Courseware			
Coordinate Subject Matter Experts/Super Users for Development			
Developer Workshop			
Prepare Materials			
Deliver Workshop			
Develop Tracking Tools			
Develop Courseware Tracking & Version Control Tools			
Develop First Drafts of Course Components			
Develop/Quality Review Internal Draft of Non-Transaction Components			
Develop/Quality Review First Draft of Non-Transaction Components			
Develop/Quality Review First Draft of SAP Productivity Pak Documentation			
Develop/Quality Review First Draft Exercises and Data Requirements			
Develop First Drafts of Course Assessments			
Determine Assessment Needs for Courseware			
Develop/Quality Review First Draft of Assessments			
Develop Final Drafts			
Develop/Quality Review Final Draft of Non-Transaction Components			
Develop/Quality Review Final Draft of Course Materials			
Develop/Quality Review Final Draft of SAP Productivity Pak Documentation			
Develop Exercises			
Create Exercise Guide			

Identify Data Requirements			
Load Data for Exercises			
Test Data			
Super User Sign-off			
Develop/Quality Review Final Draft Exercises and Data Requirements			
Develop/Quality Review Final Draft of Job Aids or QRC's			
Finalize Courseware Production			
Produce/Distribute Courseware			
Design Course Prototype			
Develop Prototype			
Deliver Prototype			
Sign-off for Courseware Development			
Training Environment Development			
Load Courseware Content to Servers			
Test and Validate Course Exercises			
Revise Course Exercises as Needed			
Validate Data Requirements in Training Landscape			
Revise Data Requirements in Training Landscape as Needed			
Validate Security for Trainers and Students			
Revise Security for Trainers and Students as Needed			
Validate Access to Training Clients and Materials at Training Locations			
Revise Access to Training Clients and Materials at Training Locations as Needed			
Confirm Refresh Schedule with IT/Basis Team			
Revise Refresh Schedule with IT/Basis Team as Needed			
Deploy Courseware & Support Documentation			
Deploy & Distribute Courseware for End User Training			
Distribute Support Documentation & Training Content to Project Website			
Confirm Distribution of Training Content			
Finalize End User Training Schedule			
Revise Preliminary Schedule from Training Scheduling Activity			
Reassign Trainers to Courses			
Reassign Stakeholders to Courses			
Update and Communicate Scheduling/Registrations Process			
Sign-off for Final Training Schedule			
Education Readiness Assessment			

Conduct Education Readiness Assessment

Review findings with Project Management Office

Complete Education Readiness Assessment Report & Recommendations

Present Education Readiness Assessment to Steering Committee

Complete Realization End User Training Development & Sign-off

Deploy

Refine Training Project Plan

Conduct Pre-Go Live End User Training

Coordinate with Organizational Change Management

Begin Training Delivery

Collect Course Evaluations

Review Course Evaluations

Debrief with Trainers

Make Adjustments Based on Evaluations

Communicate Parking Lot Issues

Complete Final Prep End User Training Delivery

Assess Pre-Go Live Courseware Evaluations

Courseware Maintenance Strategy

Define On-Going End User Training Program Maintenance Requirements

Review/Validate Training Program Maintenance Strategy with Stakeholders

Training Program and Courseware Maintenance Strategy Complete

Refine Training Project Plan

Knowledge Transfer Evaluation

Review Knowledge Transfer Agreements

Identify Knowledge Transfer Gaps

Develop Plan to Address Gaps

Document Knowledge Transfer for Competency Center

Sign-off Knowledge Transfer Agreements

Coordinate with Organizational Change Management

Support to Run

Refine Training Project Plan

Create Post Go-Live Education Plan & Schedule

Draft Plan

Approve Plan

Conduct Post-Go Live End User Training			
Begin Training Delivery			
Collect Course Evaluations			
Review Course Evaluations			
Debrief with Trainers			
Make Adjustments Based on Evaluations			
Communicate Parking Lot Issues			
Complete Post-Go Live End User Training Delivery			
User Health check Assessment			
Conduct User Health check Assessment			
Review findings with Project Management Office			
Complete User Health check Assessment Report & Recommendations			
Present User Health check Assessment to Steering Committee			
Create Education Sustainment Program			
Assess Post-Go Live Courseware Evaluations			
Identify Education Sustainment Requirements & Draft Strategy			
Identify Components for New Employee Education			
Identify Components for Position Change Education			
Repurpose Courseware for Education Sustainment Program			
Education Sustainment Program Sign-off			
Close of Project Review and Sign-off			

7.3 Training Delivery

Overview training

- During Explore phase; System walkthrough shall be conducted on each business scenario per module for key users & business owners.

Hands on training

- During Realize (with key user) & Deploy phase (with end user); where a detailed training workshops is conducted.

8. Program Governance

8.1 Project Resources Summary

RAK PSD Team

Edraky understands that companies are confronted with resource and time constraints. Our team will make all necessary efforts to minimize the participation of RAK PSD personnel in technical activities such as system configuration. It is however fundamental to the success of the implementation that subject matter experts with deep knowledge of RAK PSD's internal business processes and business objectives are assigned to the project.

The following table outlines RAK PSD team for the implementation period. The same resources should be involved throughout the project lifecycle. This schedule does not take into account all work required for data cleansing, legacy data extraction, security administrator for RAK PSD's network, and PC's.

1. Project Sponsor
2. Project Manager
3. Technical System Administrator
4. Finance Business Owner
5. Fund Management Business Owner
6. Group Consolidation Business owner
7. Sales Business Owner
8. Procurement Business Owner
9. Inventory/ Warehouse Business Owner
10. Projects Business Owner
11. Business Intelligence Business Owner
12. Maintenance Business Owner

Edraky Team

The following outlines Edraky team for the implementation.

1. Project Sponsor
2. Project Manager
3. SAP Finance & Control Consultant
4. SAP Material Management Consultant
5. SAP Sales & Distribution Consultant
6. SAP Project System Consultant
7. SAP Business Intelligence Consultant
8. SAP Plant Maintenance Consultant
9. SAP Warehouse Management Consultant

10. SAP Fund Management
11. SAP Technical Consultant
12. SAP Group Consolidation Consultant

8.2 Roles and Responsibilities

A key success factor for the implementation project is a strong core project team that consists of both RAK PSD resources as well as Edraky resources working hand-in-hand. Specific roles include:

Executive Project Sponsor

The Executive Project Sponsor will provide and communicate at large a vision of RAK PSD's long-term goals and objectives and general support of the project from a company level. He will aid in resolution of issues that cannot be resolved within the team, and will ensure 24-hour turnaround on decision making.

RAK PSD Project Manager

RAK PSD project manager will have part of responsibility for the project deliverables and will provide day-to-day direction to the project team. He will be responsible for the detailed training schedule streamlining resolution RAK PSD project manager will provide project management for the implementation as well as play an active role in the integration between the individual teams.

Edraky Project Manager

Edraky Project Team Manager has a primary ownership of the project deliverables, and he will assist RAK PSD Project Manager and to manage Edraky's provided consulting services. Other activities include scope management, and the development of the detailed project schedule. This assignment in no way eliminates the need for RAK PSD to appoint a project manager.

RAK PSD Project Team Members

RAK PSD Project Team Members are responsible for the overall business functionality, testing, end-user training and acceptance of the SAP Solution. They will provide expertise knowledge of the day-to-day business processes and master data within each functional area.

Edraky Team Members

Edraky Team Members are responsible to educate and enable the users to run the new company's business processes with the highest quality, understanding and responsibility. They will provide quality assurance and expertise knowledge of the solution functionality, processes and integration.

RAK PSD Organizational Change Management Responsible

One essential responsibility for the consultant is to transfer the knowledge on how to effectively use the new system. Effective Organizational Change Management (OCM) by RAK PSD prepares the future users to accept the new system and adapt the operations accordingly. Without OCM, the consultants may spend more time "convincing" instead of "transferring knowledge". Adopting

the new solution means letting go of old work habits. Natural resistance can be minimized if some (common-sense) effort is given to managing the change. By ensuring that benefits and consequences of the system change are well understood, OCM contributes to building commitment. This translates into a more rapid return on investment.

9. Organization change management (OCM)

9.1 When Does an Organization Need Change Management?

There are many situations where an organization needs to incorporate change management. Many times it is due to an expansion, restructuring, merger & acquisition, regulatory compliance, Enterprise Resource Planning (ERP) technology roll out or others such as language, culture, etc. To determine the client needs, we need to know how they are managing change today, what are their current challenges and opportunities, what organizational challenges and changes are they expecting, and how are they integrating change management and training. We assess the business case and ensure alignment with executive vision and goals. We look at how they communicate and train their employees today and help them to strategize the best approach for their culture. Risks and business impacts are identified and communicated to the appropriate level of the organization. In other words, we help the organization become ready for the impact of change through the use of a standardized methodology and consulting expertise.

9.2 The Top Issues Facing Organizations Implementing ERP Systems

Many ERP implementations have discovered the hard way that people impact the success of an implementation. If the organization is not ready for the transformation, the project will miss time lines and come in over budget. Organizational change management uses a solid methodology for assessing all the key areas of the people side of an implementation and surfacing risks before they become expensive mistakes.

9.3 The Characteristics of Accepting Change Within an Organization

The organization follows a commitment curve on every ERP implementation. OCM will educate the end users and leadership to make them aware of the changes that are coming their way. There are best practices OCM follows for teaching and encouraging the organization how to understand and accept the changes. Only after all the individuals accept the changes can we say the organization has reached full adoption. OCM works at the individual levels through communication, involvement, training, support, reinforcement, etc. to build consensus through out the organization.

9.4 Organizational Change Management Levers

Organizational change management has the capacity to leverage positive change. All of the following levers are active in an organization at all times, influencing each lever provides momentum to shift the culture.

- Leadership and Sponsorship

  Develops a culture of change leadership that aims to build commitment through accountability, role clarity, and executive development.

- Skills and Competencies

  Incorporates competency assessment and skill development for all employees. This lever incorporates learning, training, and succession planning into all OCM initiatives.

- Organizational Alignment

  Aligns business and process metrics with process roles and management structures.

- Communications

  Enable change through frequent and factual information flow, and clearly explained impacts, roles and responsibilities, benefits, and rewards.

- Governance and Compliance

  Clearly assigns roles and responsibilities, including decision-making responsibility and creates a culture of compliance based on measurement and consequences.

- Performance Management System

  Establishes and measures individual and group performance, ensuring alignment with enterprise strategies, goals, and objectives.

- Incentives and Rewards

  Provide clarity of desired performance and compensation, bonus and promotions that is consistent with good performance and client successes.

- Hiring and Selection

  Provides personnel strategies (such as retrain or hire; grow organically or acquire) that ensures individuals possess the right skills and competencies at the right time, resulting in program success.

9.5 Organizational Change Management Methodology

The organizational change management methodology has been designed based on best practices in the industry. All change management tasks have been aligned and organized with the SAP implementation methodology in order to conduct the right change management task at the perfect time during the implementation. An OCM consultant will identify along with the client, the best change management roadmap for their project. Once the change management strategy is decided on, the OCM consultant works with the project manager to link the change management project plan milestones to the overall implementation project plan. These milestones are identified in the change management methodology by phase and category.

9.6 OCM Sample Deliverables

EDRAKY Technology & Beyond

OCM Analysis Template

Purpose	**The purpose of this document is to help you capture information about any stakeholders with potential influence to the project. It will help you identify :** **1.Which benefit is expected from the stakeholder group / the single stakeholder for the company throughout the project .** **2.Which benefit is expected from the stakeholder group / the single stakeholder throughout the project .** **3.How does the stakeholder group / the single stakeholder assess the feasibility of the project .**

Project Identification			
Project Name	**Project Number**	**Project Type**	
Customer Name		**Customer Number**	**Project Start to Finish**
Project Sponsor	**Program Manager**		**Project Manager (Customer)**
Project Manager	**Service Partner(s)**		**Project Manager (Service Partner)**

EDRAKY Technology & Beyond

OCM Analysis Template

Stakeholder

1. Insert name of stakeholder group or of single stakeholder
2. Provide comments if further information is available
3. Estimate the influence of the stakeholder / the group on the project

Influence on Project

Name

Approach

Stakeholder Persons			
Name	**Function**	**Comment**	**10**

Score value between 1 and 10 (one decimal place allowed)
1 = low : can hardly influence
5 = medium
10 = high ; can stop project

Stakeholder(s)

Name	Comments	Personal advantage / disadvantage	Opinion about SAP and the related value for	Expected feasibility	Acceptance Layers: Expected value for Customer 10= high 5= medium	Expected personal value 10= high 5= medium	Estimation of employees concerning 10= high 5= medium
Name					6	9	9
0							
0							
0							
0							
0							
0							
0							
0							
0							
0							

Approach

1. Name is inserted automatically

2. Provide comments if further information is available

3. Which **benefit** is expected from the stakeholder group / the single stakeholder **for the company** throughout the project

(Value between 1 and 10; one decimal place allowed
1 = expects significant disadvantages,
5 = expects neither improvements nor worsening situation,
10 = expects significant improvements for the company

4. Which **benefit** is expected from the stakeholder group / individual stakeholder throughout the project

Value between 1 and 10; one decimal place allowed
1 = expects significant disadvantages,
5 = expects neither improvements nor worsening situation,
10 = expects significant improvements for the stakeholder group or him/herself

5. How does the stakeholder group / the single stakeholder assess the **feasibility** of the project?

Feasibility Score (Value between 1 and 10; one decimal place allowed)
1 = not feasible,
5 = its partly feasible, but the overall goal will not be realized,
10 = extremely feasible

9.7 Communications Management

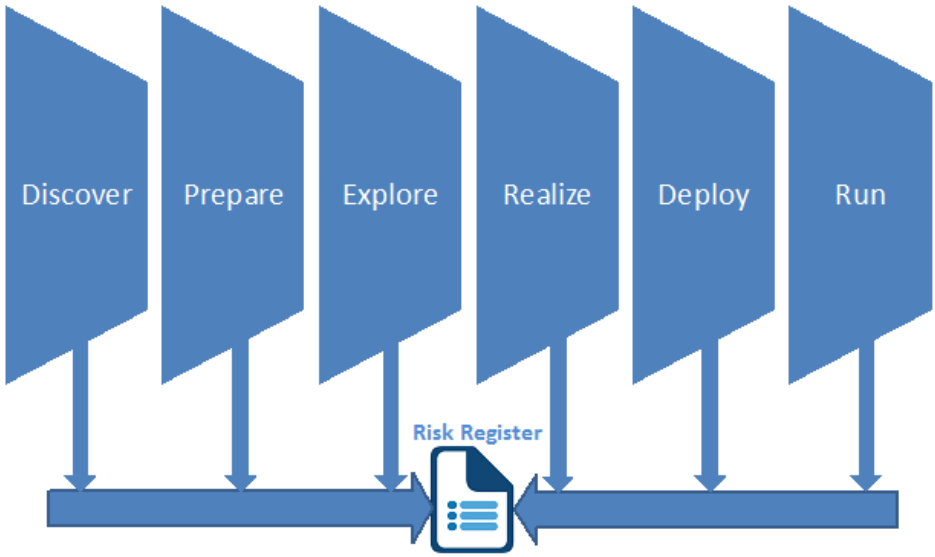
Communication Plan - Project Meetings

Meeting	Frequency	Content of Meeting	Participants	Responsible for		Recipients of Meeting Minutes
				Invitation	Meeting Minutes	
Steering Committee Meeting	Monthly (2h)	Strategic / High level Update; Request for Strategic Approval	Steering Committee Members from RAK PSD	RAK PSD Project Manager	Project Management Office	Steering Committee Members
Project Mgmt. Meeting	Weekly (1h)	Update / Progress; Verify direction Project monitoring and progress tracking Issue resolution Escalation management	Project Managers (RAK PSD, EDRAKY) Risk Management(RAK PSD) Quality Assurance (RAK PSD) OCM (RAK PSD)	Project Manager (EDRAKY) (Project Management Office)	Project Management Office	Meeting invitees Project Manager (RAK PSD, EDRAKY)
Regular Team Meeting	Every 2 weeks	Update status/ Progress of each track: Status, next steps Critical Issues Latest Info Open issues	Project Leads Project Team	Project Leads	Assigned team member	Meeting invitees Project Manager (RAK PSD, EDRAKY)
Individual Meetings for action points responsible	Depending on action point time frame	Detailed Status Next Steps Degree of WBS completion Critical Issues Risks	-Project Leads -Action Point Responsible	Project Leads		-Meeting invitees Project Manager (RAK PSD, EDRAKY)

10. Risk Management

10.1 Introduction

The S4HC implementation follows SAP Activate methodology. The methodology has Discover, Prepare, Explore, Realize, Deploy and Run phase. At every phase of the project, a new risk will inject and existing risks will close.



Categorized risks during different phases of the project:

Phase	Risks	Risk Category
Discover	System Understanding	Scope
	Infrastructure Requirements	Requirement
Prepare	Process and fitment with “what we do”	Scope

	Availability of the given functionalities	Scope
	Columnar Database related risks	Architecture
	Deployment over Cloud	Architecture
	Mobility Related risks	Architecture
Explore	Best Practice fitment into their current business processes	Scope
	Data Migration methodology	Data Migration
	Lack of understanding of ACTIVATE Methodology	Implementation
	Data Security	Security
	Ineffective Fit-to-Standard meetings	Scope
	Ineffective / Lack of participation in Fit-to-Standard	Communication
Realize	Changes in Scope	Scope
Deploy	Lack of training, learning or participation from End Users	Learning
Run	Lack of Continuous Support	Reputational

Risk management will start from Discovery phase of the project. Even though we are far from implementation, we need to create the risk register. You may encounter the maximum amount of risks during the Prepare & Explore phase of the project. The risk management will follow the following steps:

- Risk Planning – During the planning process, you identify:
    - Risks
    - Risk Owners
    - Risk Tolerances
    - Risk Processes
- Risk Assessment – During the assessment phase of risk management, you will
    - Assign probability, impact, importance & timing
    - Interdependencies and confidence limits
    - Prioritize risks
    - Analyze risk trends
- Risk Response – Finally, in this part of risk management, you will
    - Monitor & communicate the status and trends of risks
    - Balance the project, and
    - Manage the investment choices

10.2 Risk Planning

It is a process of identifying risks and others factors associated with the risk management. Risk Planning is carried out during the defining phase of the project management. It is during this phase where we create the Risk Management Plan. Here are the four major activities that we perform during Risk Planning.

10.3 Identifying Risks

Imagine what can happen if you miss identifying a critical risk, positive or negative. It will impact the financial benefits of the project. A strong risk identification process is critical to the success of risk management which in turn, is critical for the successful outcome of the project. During this process, we prepare many documents such as Risk Register, Opportunity/Threat Matrix, Risk Breakdown structure and few others. All the identified risks must be noted down in Risk Register.

Here are few of the sources from where we can identify a risk:

- ***Look at the Assumptions*** – We make lots of assumptions while building the project plan, defining the scope, deciding the schedule and milestone, estimating costs, and during several other key process & steps. Assumptions are the first place to start with to identify the risks. It is also important to note that the quality of risks or the number of risks identified from this

section is limited and directly proportional to the assumptions listed. During the discovery phase of the ACTIVATE Methodology, many of these risks can be identified. Any sessions, meetings with the prospective client will help you identify a risk.

- ***Historical Information*** – Look at the historical information to identify the type of risks and issues that a similar project faced. There may not be a lot of historical information available.
- ***Prior Experience*** – Organize brainstorming sessions with peer managers and business leads to discuss their prior experience in similar projects. The discussion must remain within the context of risk management. It will give you a good amount of risks.
- ***Expert Judgement*** – Include Subject Matter Experts in those brainstorming sessions. It will help you identify risks that are relevant to the functional areas.

10.4 Identifying Risks Owners

Every risk must have an owner identified. A risk owner is the team member, responsible for the management, monitoring, and control of an identified risk, including the implementation of the selected responses. A risk owner is identified based on the risks and the knowledge requires carrying out the activities related to that risk. The responsibilities of the risk owner include but not limited to

- Manage, monitor, and control the risks.
- Implement the selected response strategy of the risks
- Share the status updates with risk response board, Project Manager and PMO
- Owner may provide an input, suggestions for improvement to risk framework
- Risk Owner may play a decisive role in setting up risk policy, tolerances, and processes

10.5 Identifying Risk Tolerances

Risk tolerance is the degree of variability in investment returns that an organization is willing to withstand. As a Client Project Manager, it is critical for you to understand the organizational risk tolerance. Furthermore, if the tolerance level at the Project level may different than organizational tolerance then you need to have the buy-in from organization management and executives.

10.6 Identifying Risk Processes

As a part of Risk Management Planning, it is important to know and understand the risk processes. Additionally, not all the processes will be utilized for the project. Identify those processes that you think will need for the Project, ensure that the process work for your organization, have complete documentation and your team is educated about the process.

10.7 Risk Assessment

Risk assessment is to analyze a given risk, qualitatively or quantitatively, to estimate the threat related to a well-defined situation. Based on the assessment, a risk can be handled in many possible ways.

a. <u>Assign Probability, Impact, Importance & Timing</u>

As an important part of Risk Management, the risk owner assigns the probability of occurrence and the impact of the risk in case the risk does occur.

We all know that for each risk, we identify and assign a category for that risk. The "importance" defines the importance of that category. There are certain categories that are more important for the project than others. One such example is the "Financial Risk". For a certain project, "Financial Risk" will have more importance than "Timeline" related risks. However, for a Product launch, competing against a similar launch from a competition, "Timeline" related risks would be more important than "Financial".

Additionally, a scope related risk occurring at the beginning of the implementation will have less impact as compared to the same risk occurring at the middle or end of the implementation. So it is important to identify the timing of the risk. What it also means is that we need to assess the risks at a given frequency and assign the probability, impact, importance, and timing of each risk.

b. Analyze Interdependencies and identify confidence limits

Interdependency is the relationship between a risk and the type of the risk. Type of risk is also known as risk category. In general, these are the types of risks:

- Strategic Risks
- Compliance Risks
- Operational Risks
- Financial Risks
- Reputational Risks

Confidence limit is the assurance level of the risk and performance measure.

c. Prioritize Risk

The risks are recorded in risk register according to their priority. In general, the risks are prioritized within the given category. In some instances, you can also prioritize the risks across the implementation. However, the risks are always prioritized based on the probability of occurrence and the impact of that risk.

d. Analyze Risk Trends

As a part of the continuous analysis, we analyze the risks at a regular frequency; if needed we re-assign the probability, impact, importance, timing, category, confidence limit, priority or any other parameters.

10.8 Risk Response

So far, we have identified and prioritize the risks. However, that's not enough. We need to know exactly what to do in case of the risk being real. We need to detail the response strategies for each risk. There are several ways to respond to a risk. They are

- Avoidance – is a way to eliminate the activity that can expose the organizational asset to negative impact.
- Prevention – is to apply the process and techniques that will prevent the risk of
- Mitigation – involve creating a plan that will help to reduce, eliminate or manage the risk within an acceptable limit.
- Retention – is a strategy to retain the risk where the cost of the risk is less compared to the cost of mitigating the risk.
- Transfer – is a strategy to pass the risk to the third party.

The detail for the above-mentioned strategies is beyond the purview of this blog however it is important for you to know the definition of these.

a. Monitor the status and trends

As a part of risk response strategy, you need to monitor the status and trends of performance data. It compares the data for past performance and current performance, recent trends, and compares recent changes in the project. As a project manager, you need to understand these trends to identify the trigger point for a given implementation. This status and trends must be communicated to risks owners so that they can further the analysis.

b. Balancing the project

In case of any deviation due to risk management or in any other scenario, rebalancing methods are utilized to bring the project realigned with organizational strategies.

c. Manage the investment choices

There are several investment choices tools, some of them are

- Trade-off analysis – will determine the effect of changing one or more parameters of the project.
- Market-payoff variability – analyzes the effect of a change in pricing & sales forecast on the project itself.
- Budget variability – analyzes the effect of changing the project itself.
- Performance variability – analyzes the performance of the project.
- Market requirement variability – analyzes the change in the market requirement in relation to the project.
- Time-to-market variability – it determines the effect of project velocity.

11. Edraky Customer Reference

We have highlighted some of our customers' success stories. We are confident that the continued success of our customers is the best illustration of how Edraky can help RAK PSD run better.

12. Supporting Documents

Edraky at a Glance – 2019 Awards

Edraky won the **Partner Excellence Award 2019** "Marketing Momentum EMEA South"

Edraky won the **Best SAP S/4 HANA Partner Award** in 2019 - MENA Region

Edraky is Elected as a Member of United-VARs Steering Committee, the only SAP recognized international alliance of elite SAP AG partners

13. Securing Coding Process

13.1 Backup & Disaster Recovery procedures

Edraky shall provide all IT service continuity plans and protection strategies such as high availability, SAP system and database backups, and disaster recovery (DR) approaches and action plans throughout and after the project finalization.

Edraky shall prepare all backup procedures and scripts that are needed to safeguard the system against any disruption or loss.

13.2 Audit Trails

Viewing Log and Trace Files

The trace and log messages contain important information about system operations. It is helpful to check and analyze them if you experience errors or undesired behavior.

The log viewing functions of the SAP Management Console perspective provide you the following features:

- Viewing all system log and trace files
- Viewing developer trace files
- Creating stack traces for the processes

There are the following types of log and trace files:

- Startup and control framework logs:

  Contain information about the startup process. You can check these files if errors or undesired behavior occur during the startup process. By default, the data from the last three restarts is kept.

  The developer trace files and system output of all the executables belonging to an instance are located in the directory \usr\sap\<SAPSID>\<instance name>\work, where <SAPSID> is the SAP system ID (for example, CE1) and <instance name> is the instance name (for example, JC00 or SCS01).

- AS Java logs:

  The log and trace files generated by the AS Java process(es) and the applications running on top of AS Java are stored in the usr\sap\<SID>\<instance name>\j2ee\cluster\server<n>\log directory.

13.3 Cryptography, Security & Firewall

1. **SNC client encryption**

SNC Client Encryption uses Secure Network Communications (SNC) to provide encryption and secure communication for the communication channel between the client and the SAP NetWeaver Application Server for ABAP. This protects the business user operating the client from eavesdroppers, who seek to capture or manipulate information, such as logon data or business data. In a standard setup, users enter their user name and password into the logon screen of the SAP GUI. SAP GUI transfers data, such as user names and passwords, through the network without encryption.

2. **VPN encrypted tunnels**

The other solution is to use VPN, in which SAP systems will be located behind a firewall, and users will access the systems through encrypted VPN tunnels.

13.4 Single Sign On

- SAML/ SPNEGO need to be configured for SSO of S/4 system
- SNC clients need to be installed and configured for accessing SAPGUI without providing User ID and Password
- Active Directory (AD) synchronization jobs need to be scheduled between AD and S4 system
- SSO need to be configured for S/4 system - Inside the premises

13.5 Session Management Controls & Application Authentications

The authentication infrastructure of the SAP NetWeaver Application Server (AS) Java implements the Java Authentication and Authorization Service (JAAS) standard to support various authentication methods. This enables you to choose the authentication mechanisms for your applications in a pluggable manner, using login modules and login module stacks.

Key Points

Login Modules

Authentication on the AS Java is performed using predefined authentication classes, referred to as login modules. A login module contains an implementation of a Java class that defines authentication logic.

Policy Configurations and Authentication Stacks

The various components on the AS Java, such as applications, services, or modules, are registered with the AS Java security services so that you can apply security restrictions to them. The set of security restrictions for an AS Java component is referred to as a policy configuration.

To enforce different authentication logic in a component's policy configuration, you can define groups of login modules. Such groups are referred to as login module stacks or authentication stacks. Login module stacks enable you to choose or combine different combinations of authentication mechanisms for access control to the applications you create or for the different AS Java components.

Session Management

The AS Java maintains application session for all interactions between user agents and stateful applications. Once a user has been authenticated the AS Java creates a security session.

Authentication Concepts

Authentication is an element of information security that enables you to protect the confidentiality, integrity and availability of the information flow, supported by the information systems in your business operations. With the increasing use of distributed systems based on open standards and flexible information sharing with multiple business partners, establishing the identities of communicating parties also becomes an important element in protecting your business operations.

Authentication in SAP NetWeaver includes the process of establishing and verifying the identity of a person or a system component as a prerequisite for allowing the person or system component access to an SAP NetWeaver server system.

Implementation Considerations

SAP NetWeaver is a component in your system landscape that enables integrated access to use various back-end resources. Therefore, the authentication process is initiated when a client system requests access to various system resources.

You can use several types of client frontends to access SAP NetWeaver systems over different corresponding communication channels. The mechanisms for authentication in SAP NetWeaver are specific to the communication channel you use to access system data.

Features

Conforming to the client-server architecture of the system, the authentication process is negotiated between the client front-end and the back-end SAP NetWeaver server. See the topics below for an overview of the authentication functions available with each of the access channels for your SAP NetWeaver systems.

- Authentication for SAP GUI Access
  Provides information about the available authentication mechanisms for interactive user logon when using the SAPGUI as a front-end client.
- Authentication for Web Based Access
  Provides information about the available authentication mechanisms for interactive user logon when using HTTP based front-end clients, for example, Web Dynpro.
- Authentication for Web Services
  Provides information about the available mechanisms for authenticating Web Service access to SAP NetWeaver systems.
- Authentication for Communication between Systems
  Provides information about the supported mechanisms for authenticating system-specific (non-dialog) communication to and from SAP NetWeaver systems.

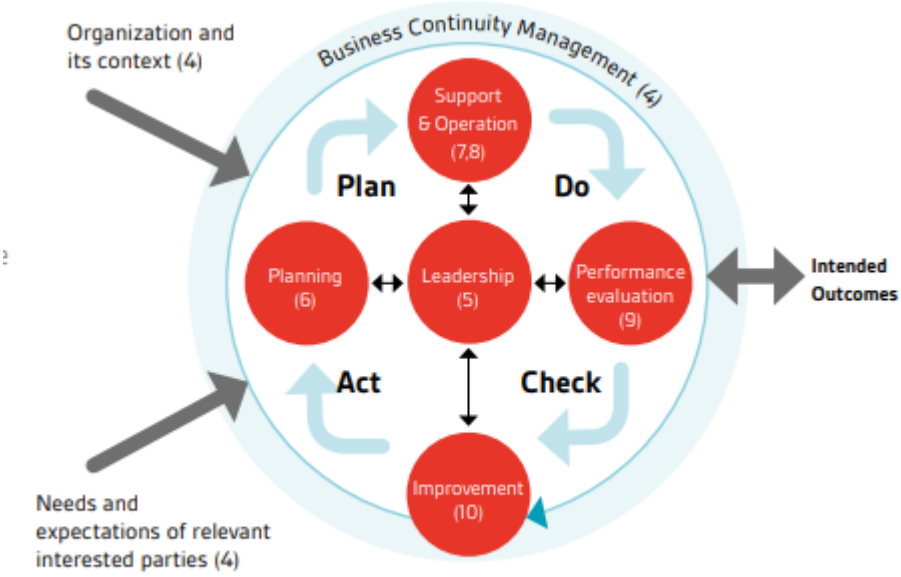
14. Edraky's Service Continuity

ISO 22301 is the international standard that helps organizations put business continuity plans in place to protect them, and help them recover from, disruptive incidents when they happen. It also helps you to identify potential threats to your business and to build the capacity to deal with unforeseen events.

It helps you to protect your business and your reputation, stay agile and resilient, and to minimize the impact of unexpected interruptions. Whether your business is large or small, the ability to respond quickly and effectively to the unexpected is the key to the survival of any organization.

This is why having a robust business continuity management system in place, such as ISO 22301, can be considered as one of the most comprehensive approaches to organizational resilience.

Edraky shall comply with the following ISO 22301 Clauses:



- **Clause 1:** Scope The first clause details the scope of the standard.
- **Clause 2**: Normative references This clause provides the normative references contained in the standard.
- **Clause 3**: Terms and definitions Please refer to the terms and definitions contained in ISO 22300. This is an important document to read.
- **Clause 4**: Context of the organization This clause is a good starting point to approach the standard as you need to decide on the context of your BCMS and how your organizations' strategy supports this. This means that you need to identify how your organization sits within its environment. You will need to identify external and internal issues that are relevant to the purpose of the BCMS and how they relate to its expected outcomes. Then you'll need to identify your relevant internal and external "interested parties" (or stakeholders) who are relevant to the BCMS. You'll also need to decide what is covered by business continuity and just as importantly what isn't. This means that you will need to

consider your appetite for risk and what the relevant legal and regulatory requirements for your organization are.

- **Clause 5:** Leadership This clause focuses on the role and requirements of top management, which is the group of people who direct and control your organization at the highest level in relation to the BCMS. Top management must show their commitment to the BCMS in a number of different ways. Firstly, by ensuring the BCMS is compatible with the strategic direction of the organization. Secondly, they need to show how your BCMS requirements are integrated into your business processes. And lastly by communicating the importance of an effective BCMS and conforming to the BCMS requirements. Policy creation and communication is a really important part of this clause. You will need to ensure that your business continuity policy is appropriate for your organization and that it meets relevant legal and regulatory requirements. It should also be made available to all interested parties you have identified. Top management should assign responsibility for the establishment, implementation and monitoring of the BCMS. And finally, you will also need to show how you continually improve the BCMS.
- **Clause 6:** Planning This clause relates to establishing the strategic objectives and guiding principles of the BCMS as a whole. It requires you to consider the risks from your BCMS not being successfully implemented. This means that you need to make sure you understand both the internal culture and the external environment in which your organization operates and also what the likely barriers may be in preventing your BCMS from being effective. You will be required to clearly define your business continuity objectives and show that you have plans to achieve them. Your objectives should be measureable. You will also need to decide on the minimum level of products and services that will be acceptable to your organization in order to achieve your business objectives. (This links back to the scope that you have defined in clause 1). You'll need to decide who will be responsible for delivering the objectives, what will be done in what timescale, what resources will be required, and how the results will be evaluated.
- **Clause 7:** Support This clause is all about the resources that are required to establish, implement and maintain an effective BCMS. You 'll need to make sure that people are competent in terms of education, training, awareness and experience. You will also need to

consider the communications with interested parties and your requirements for document management. Taking into consideration the increased use of subcontractors in today's business environment this clause requires you to make sure that everyone under the control of your BCMS understands their contribution to its effectiveness and the implications of not conforming to it. Critically, they must understand their role at the time of a disruption. You will also need to show how you respond to communications from interested parties. It is crucial that your organization fully documents all elements of the BCMS and these documents must be maintained, controlled, and stored appropriately. (How you do this is up to you, but it must be effective for your organization).

- **Clause 8:** Operation In this clause you must show how the processes that you have developed to manage the risks to the BCMS are being correctly implemented. This includes any processes that may have been subcontracted or outsourced. You need to define the order and timing of recovery for critical activities that support your organizations products and services. This includes deciding on what a minimum acceptable level is. You need to be aware that there may be certain financial or governmental obligations that require communication and that there may be a societal need to share certain information in the event of a disruption. Your process should focus on minimizing the consequences of a disruption. You will also need to have documented procedures to restore and return business activities from the temporary measures adopted to support normal business requirements after an incident. Although you do not need to have an approved exercise programme in place to check the effectiveness of your BCMS, you do need to have exercises based on an appropriate range of scenarios. Lastly, you will need to promote continual improvement of the BCMS.
- **Clause 9:** Performance evaluation This clause covers the maintaining and reviewing of the BCMS so it is kept relevant and up-to-date. This is so that you have the metrics in place to ensure that you effectively manage the BCMS and continually improve. After an internal audit, the management responsible for the area being audited must ensure that any corrections or corrective actions that have been identified are carried out without delay. This clause also covers management review. You will need to provide information for review on the trends in; nonconformities and corrective actions, monitoring and measurement evaluation results, and auditing results. Finally, there is a requirement for your organization to communicate the

results of the management review to relevant interested parties and take appropriate actions relating to those results.

- **Clause 10:** Improvement This clause is all about making your BCMS as effective as it can be to show how you are proactive in managing it. You are required to show how you continually improve and enhance the performance of your BCMS to ensure it is robust and relevant. This may be, as a result of identifying potential threats or risks from any internal or external factors that are relevant to your organization. You will also need to show how the BCMS has been updated in response to any non-conformities or corrective actions.

15. Configuration Management

- Edraky shall prepare the solution environments including development, testing, and production environments.
- Edraky shall configure the development, testing, training and production environment to facilitate the development of new functionality as per RAK Gov. requirements and simulate RAK PSD Dept. business processes, in addition to training the users and prepare the solution production going live environment.
- Edraky shall analyze and develop data migration and conversion plan to be approved by RAK PSD Dept.
- Edraky shall configure the testing and development of solution applications and application extensions including modules, reporting engine, workflows etc.
- Edraky shall the production environment as per the approved configuration achieved during the testing stage, and incorporating customizations, reports, security roles and users and role and profile creations.

16. Testing Plan

Edraky will conduct testing for the system, application and any customized components. Testing shall include the following:

- Develop and agree on the RAK PSD Dept. plans to cover various testing stages such as functionality, customization, data conversion, interfaces, integration, etc.
- Identify and agree with RAK PSD Dept. business & Technical team on the testing scenarios & acceptance.
- Develop the solution business test script and technical test scripts & acceptance.
- Conduct Unit Testing (UT).
- Conduct User Acceptance Testing (UAT).

- Modify the solution to enhance the UAT results.
- Conduct Integration Testing & acceptance.
- Conduct Stress testing & acceptance.
- Security testing
- Conduct RAK PSD Dept. readiness testing for going live.

17. Sample Documents

Appendix 1: Sample requirements and design Document.
Appendix 2: Sample Test Script.
Appendix 3: Sample training manual.
Appendix 4: Sample user guide.
Appendix 5: Sample functional, technical and support documentation.
Appendix 6: Sample maintenance and support agreement.
Appendix 7: Edraky's Resource Resumes