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Implementation of Advanced Tools to Increase Operation Efficiency

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Implementation of Advanced Tools to Increase Operation Efficiency

by

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Abstract

The Client XYZ is a leader in developing new advanced products for the manufacturing of pharma ingredients and intermediates to provide complete value to its valuable customers and is built across 1,500 acres which consists of 29 production blocks which actively produce pharma ingredients. The client's research team is specialized in process design for new drug candidates, development up to gram/kilo scale, structural elucidation, impurity profile studies, process validation, process justification, process optimization, analytical methods development and validation, environment impact analysis, safety studies and time cycle studies etc.

There are over 68 large sites worldwide with diverse applications needs including work order, calibration, inventory, inspections, and asset management. The deployed Work Force and Asset Management is now 900 users who use smart mobile solutions on handheld devices to perform operations, calibrations, and inventory work. Results will cut overall work order activities and shortened cycle time and eliminate all paper processing activities saving over 175,000 man hours per year. This drastically reduces pre mobile paper backlog from two weeks to two hours and gives technicians the ability to see all history, inventory levels, and safety guidelines. Within a year, reduced workflow administrative costs will be reduced from $8.00 to $4.00.

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Chapter I

INTRODUCTION

The Client XYZ is a leader in developing new advanced for the manufacturing of pharma ingredients and intermediates to provide complete value to its valuable customers, built across 1500 acres which consists of 29 production blocks which actively produce pharma ingredients. Client end users implemented SAP ERP software that meets business needs in a single instance. An estimated 12,000 work orders in 15 plants worldwide all processed with paper. The client is looking for reliable solution to track and manage over 25,000 valuable assets with high value of precision and accuracy.

Challenges include huge numbers of work orders are being processed with paper and they require a reliable mobile framework to track and manage 25,000 valuable assets. The proposed solution needs to be built for easy, seamless integration in the system to manage and share information globally across all the maintenance plants. Client wants to standardize data capture among all technicians for accurate asset records that include reliable information such as failure codes. Results are 75% of the work is now planned and preventative work orders, emergency work orders are reduced by 10%, saving 20 minutes of time per technician per shift. Forty-five extra minutes of actual work time per day along with a significant boost in data.

Problem Statement

The plants which are located remotely need a tool for maintenance to quickly dispatch facilities issues to a mobile device. Work force and asset management allows the schedulers to send a work order directly to the technician and will allow the technician to access the work orders issued on the mobile device and enter time and materials needed. Technicians who are

working at machineries and functional locations are facing difficulties to enter their working hours in the system as some plants are still using paper and this is leading to production loss. To eliminate all these problems, the client decided to implement an Operation Efficiency Tool on to existing ERP for Enterprise Asset Management (EAM). Operation efficiency also helps technicians follow mandatory safety measurements at work and enter required information on mobiles.

<div align="center">**Nature and Significance of the Problem**</div>

Client has estimated 9,000 work orders per week. All are processed with paper. It takes schedulers significant time to send work orders to the technicians, resulting in an increase in process time to execute work at plants and in turn resulting in an increase of work hours by the technicians and schedulers respectively. Over 25,000 assets require a reliable mobile frame work to track and manage. Right now technicians do not have visibility into stocked spare parts and current inventory levels from the point of performance. The client does not have standardized data capture techniques to manage assets. The client does most of the work unplanned, break downs are frequent, and ratio traffic is very busy. With all these problems, the client is having a high volume of pressure from insurers, government agencies, and patient groups to reduce costs and risks involved.

Paper based reporting was causing a drag on operations with inefficient data and labor tracking and unnecessary foot traffic to receive and complete work orders.

The existing ERP package has difficulties matching with changing business needs like mobile applications. The client is having difficulties tracking repairs in real time, problems with installation, inspection, maintenance of machines, and functional locations, and technicians who

are working at heavy machines are injured frequently, leading to heavy production loss leading to shutdown of plants. As part of their work, technicians need to move constantly from one place to another fixing machine. Those technicians are facing constant problems with existing devices, they are difficult to carry and operate. After research, the client decided to implement Operation Efficiency Tool on to the existing ERP, communication and tracking of work order processes are delayed due to maintenance staff in the field, poor visibility into maintenance activities, task assignment and real-time routing of orders not possible for high priority issues

Objective of the Project

A reliable solution to track and manage over 25,000 valuable assets with high value of precision and accuracy and enable workforce with all needed technology to examine, keep up, and repair assets in the field and to streamline various key business functions by eliminating paper work and reducing work cycles and cost resulting greater visibility on asset managing.

Project Questions

1. Is business able to operate day-to-day transactions without any issues?
2. How much productivity can be improved after implementation of these tools?
3. How many hours is business going to save after going live?
4. Did plant shutdowns decrease after implementation of work force and warehouse management tools?
5. How was business able to track and manage inventory levels at warehouse?
6. Did injury levels decrease after following safety measures through work force?

Limitations of the Project

1. After implementing the project, before go-live starts in a month, some of the
    employees had concerns on the project as they have myth that this new functionality
    drastically reduces their work hours and pay, so they were not willing to show interest
    in training and used to give negative feedback on the application.

2. This application is not available in other languages, so it is limited to only certain
    languages.

3. Work force and asset management designed to work only for plant maintenance
    module in sap, other modules like materials management has no integration with
    mobility applications.

Definition of Terms

Company: A company is an organization unit in accounting which representing the business
organization each and every basic data is stored in this can also be called the client (SAP, n.d.).

Components: Components are materials needed for a work order. Components may be stock
material, non-stock material, or a non-file material (SAP, n.d.).

Equipment: Equipment refers to uniquely identifiable objects that can be installed, maintained
separately (from building or room location), and removed. Technical information and
maintenance history for equipment can be found in SAP. These items are usually expensed to a
building when installed (SAP, n.d.).

Functional Location: Functional location represents the next level of detail below the plant
(UK10). Notifications and work orders include reference to Functional Location. The functional
location denotes the place where work can be done. It represents the building, floor, or room.

Main Work Center: Main Work Center refers to the work group or person responsible for handling work order or maintaining equipment.

Notification: Notification is a nonfinancial transaction used to report a problem, request work, or record an event or activity. Notifications result from phone or electronic communication, as well as observations. Notification elements include: Description, Functional Location, Priority, Source (Reported By), and Main Work Center.

Plant: IS an organizational unit serving the entire enterprise according to production, procurement, maintenance, and material planning. So basically, plant is an operating area or branch within the company every plant has address location Material valuation etc.

Work Order: Work Order is a financial and work management transaction used to plan and charge labor, materials, and services. PM Work Orders integrate with HR/Payroll, Financials, and Materials Management.

Summary

This chapter covered a very brief introduction about SAP Operation Efficiency Asset Management and Work Force and its functionalities in the current business world, what are the problems facing by the current client using the existing practices, it explains detailed sap architecture with various environments installed in different systems, It also explains about the importance of Work Force and Asset Management and why these products useful to business to run day-to-day streamlined business process cost effectively and efficiently. It also explains newer functionalities of the SAP mobility software in the highly competitive world of enterprise applications. The next chapter explains the problem in more detail and provides a detailed review of literature.

Chapter II

BACKGROUND AND LITERATURE REVIEW

Introduction

This chapter provides a detailed background related to the problem explained in the Chapter I. The reader can easily understand the problem by reading the literature given in this chapter and can analyze the importance and significance of the problem. By reviewing methodology, the reader can easily understand the future actions implemented to solve the issue. Information was gathered from various knowledge base articles and best business practice examples, analyzed using various tools, additionally detailed explanation of literature and methodology presented in this chapter.

Background Related to the Problem

The Client XYZ is a leader in developing new advanced for the manufacturing of pharma ingredients and intermediates to provide complete value to its valuable customers. The company is built across 1,500 acres which consists of 29 production blocks which actively produce pharma ingredients. Over 25,000 assets require a reliable mobile frame work to track and manage. Right now technicians do not have visibility into stocked spare parts and current inventory levels from the point of performance. The client does not have standardized data capture techniques to manage assets. The client does most of the work unplanned, break downs are frequent, and ratio traffic is very busy. With all these problems, the client is having high volume of pressure from insurers, government agencies, and patient groups to reduce costs and risk involved.

Client's operations are extremely asset intensive and require substantial inventories to keep their equipment up and running. In addition, the company was struggling with an inefficient process to maintain accurate inventory levels, and also meet customer order fulfillment from their 7 crop protection plants.

Literature Related to the Problem

Client decided to implement a mobile solution which would streamline their business and satisfy all the other functional needs. Client approached IT implementation partners to implement the solution for them. Operation Efficiency is a product suite which has Asset Management, Work Force, Asset Management, Rounds Manager, Untether SAP with Augmented Reality Applications, 3D Visual Enterprise Viewer, EHS Safety Issue, Multisource Scheduling.
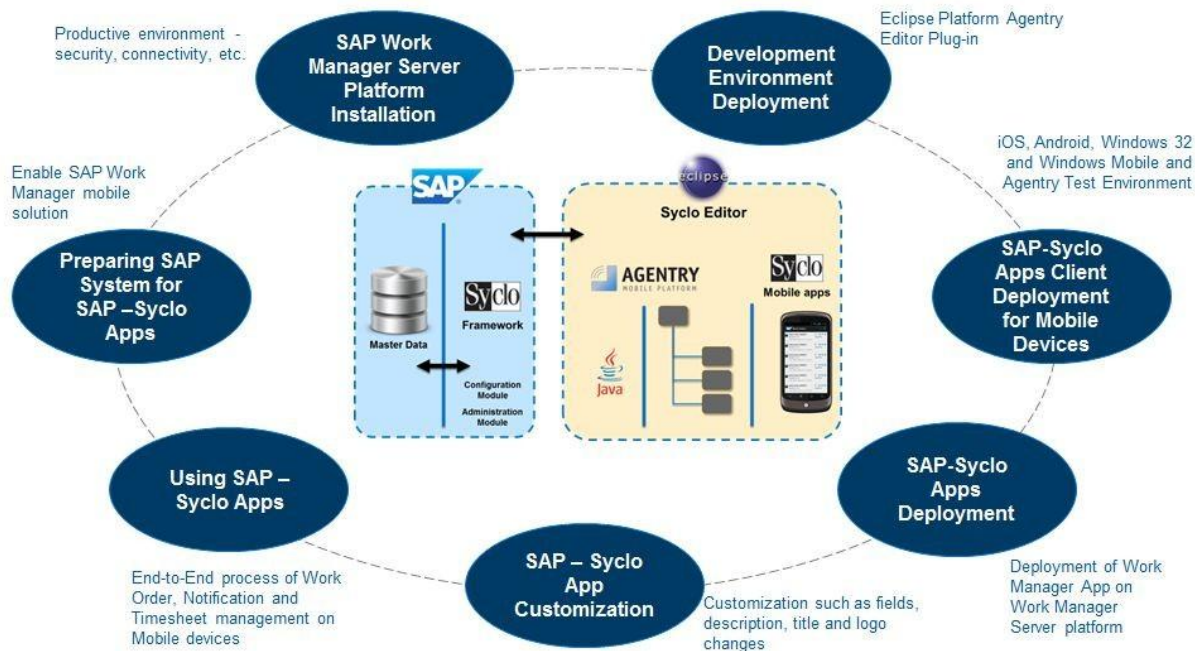

Figure 1. Interface Landscape

Work Force: Empower workforce with everything needed to efficiently install, inspect, maintain, and repair assets in the field. The SAP Work Force mobile app also mitigates the risk of injury by helping workers complete safety checks and follow safe work practices (SAP, n.d.).

- Streamline processes by eliminating paper work and shortening work cycles.

- Reduce maintenance costs by working to standards.

- Get better visibility and improved analytics by capturing higher quality real-time data.

- Keep assets running at peak performance with shorter response times and timelier maintenance.

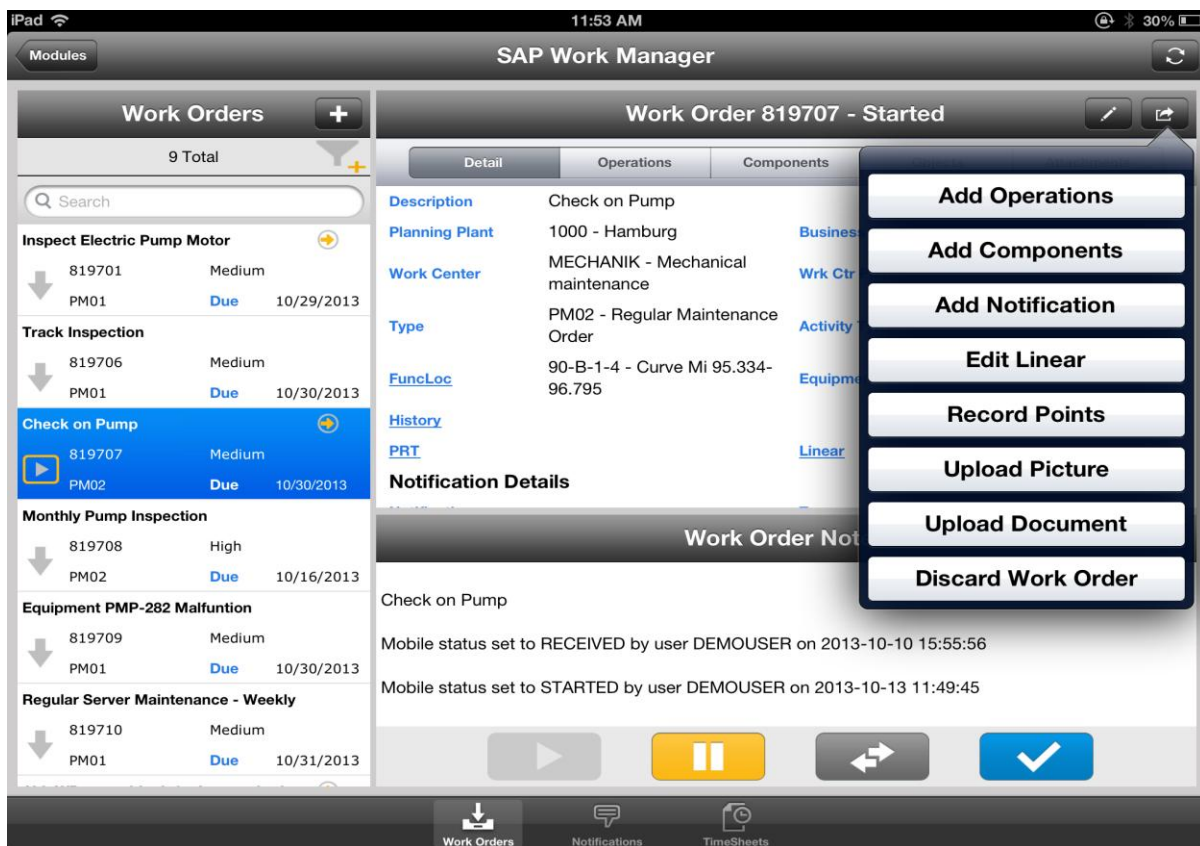- Complete safety checks and follow safe work practices to protect employees.

Figure 2. Work Order Creation Screen on Mobile Device

Asset Management: Make sure that parts and equipment are always available to enable timely and efficient maintenance of field assets. With SAP Asset Management mobile app, precise tracking and paperless management of inventory helps you increase productivity, lower costs, optimize your supply chain, and improve customer service (SAP, n.d.).

- Perform physical and cycle counts quickly and with greater accuracy.

- Check availability of materials while on the job.

- Accept and distribute incoming materials by purchase order.

- Pre-pick materials and issue, return or transfer goods electronically.

- Speed receipt and back-order reporting to and from shipping/receiving.

Figure 3. Asset Management Initial Screen on Mobile Device

Magnify the value of routine condition monitoring, meter reading, and field measurements by recording more accurate data and analyzing it faster. With SAP Rounds Manager mobile app, users can take immediate action when they find a potential problem by generating work orders and notifications on the spot.

- Record more accurate measurements and readings by eliminating on-paper notation.

- Automatically compare new data to tracked historic standards and safe ranges.

- Generate notifications of potential problems on-the-spot.

- Anticipate emergencies and outages with easy review of trend readings, points, and sequences.

- Download round data by equipment type or name.

- Automatically calculate readings, limits, alerts, and collection frequencies.

Literature Related to the Methodology

The mobility applications belongs to the plant maintenance module in SAP; it is also called enterprise asset management, The main purpose is to help SAP implementation in the most efficient manner and optimize time, people, resources, and other related functionalities.
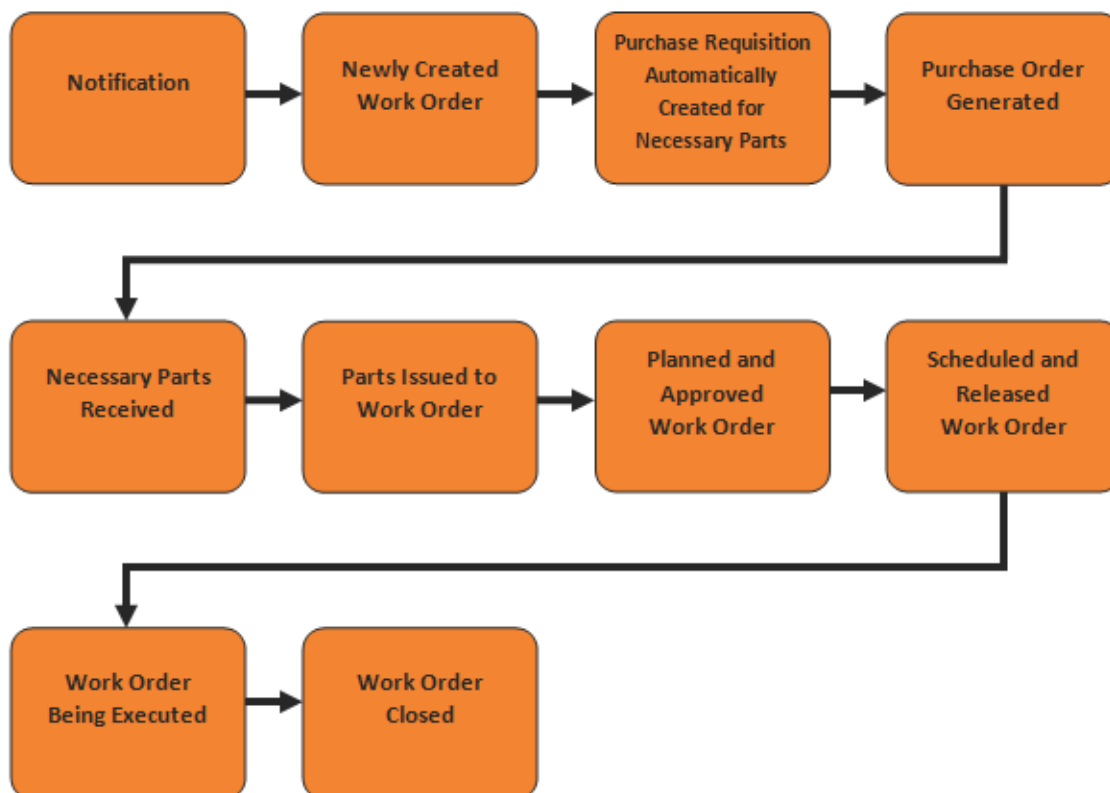

Figure 4. Normal Order Creation in a Company

SAP Company introduced standard best practices to implement SAP in any company; it is called ASAP methodology, Accelerated SAP. ASAP methodology has mainly five phases.
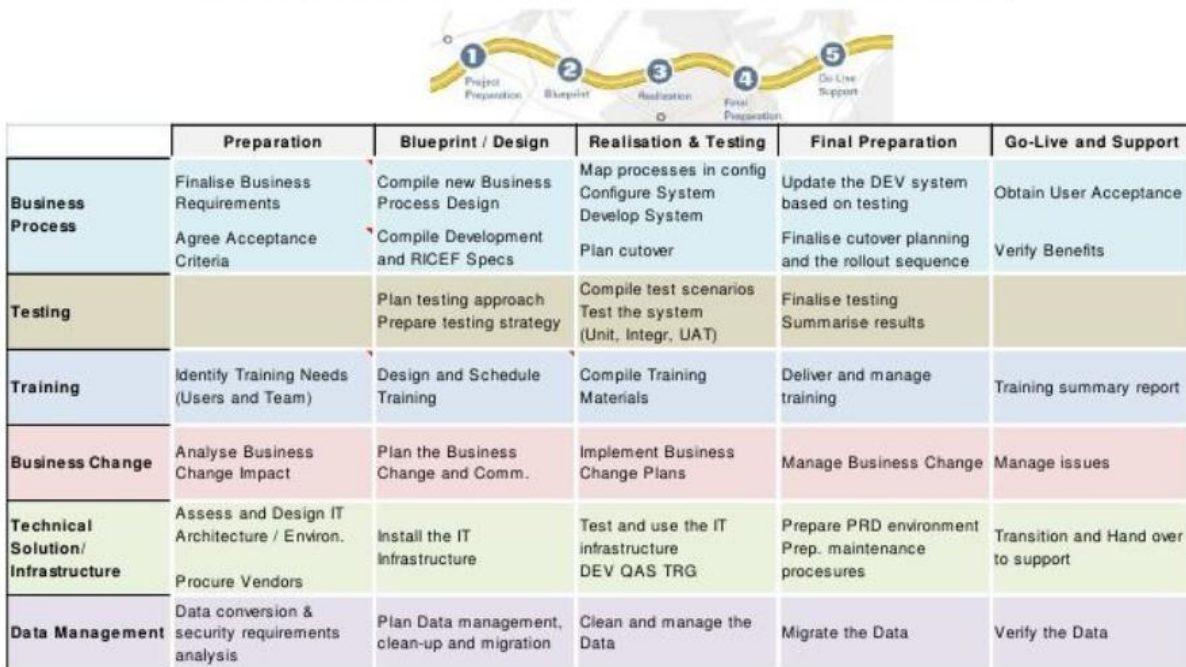
Generic SAP Implementation Map

	Preparation	Blueprint / Design	Realisation & Testing	Final Preparation	Go-Live and Support
Business Process	Finalise Business Requirements Agree Acceptance Criteria	Compile new Business Process Design Compile Development and RICEF Specs	Map processes in config Configure System Develop System Plan cutover	Update the DEV system based on testing Finalise cutover planning and the rollout sequence	Obtain User Acceptance Verify Benefits
Testing		Plan testing approach Prepare testing strategy	Compile test scenarios Test the system (Unit, Integr, UAT)	Finalise testing Summarise results	
Training	Identify Training Needs (Users and Team)	Design and Schedule Training	Compile Training Materials	Deliver and manage training	Training summary report
Business Change	Analyse Business Change Impact	Plan the Business Change and Comm.	Implement Business Change Plans	Manage Business Change	Manage issues
Technical Solution/ Infrastructure	Assess and Design IT Architecture / Environ. Procure Vendors	Install the IT Infrastructure	Test and use the IT infrastructure DEV QAS TRG	Prepare PRD environment Prep. maintenance procesures	Transition and Hand over to support
Data Management	Data conversion & security requirements analysis	Plan Data management, clean-up and migration	Clean and manage the Data	Migrate the Data	Verify the Data

Figure 5. Standard SAP Implementation Phases (SAP America, 2004)

Benefits of ASAP Methodology include:

- Reduced total cost of implementation by embedding the principles of SAP Advanced Delivery Management into a prescriptive, streamlined and modular implementation road map for ASAP.

- Content-rich implementation accelerators, templates, and guides for implementation projects from strategy to operations.

- Transparent value delivery through consistent reflection of the business case.

- Efficient project governance, quality management, and guidance for implementation projects and Business Process Management.

- Approach that combines user centric design, business processes and IT architecture

- Coverage of the entire project lifecycle—from evaluation through delivery to post project solution management and operations.

- Consistent content from Value Maps, Solutions, configuration to business process monitoring.

- Latest version of Solution Explorer and Solution Configurator to explore SAP solution capabilities, select appropriate solutions and determine best pre-assembled RDS for your project.

- Proven and scalable implementation methodology guiding your team through the agile implementation project and ensuring seamless setup of solution operations.

- Seamlessly integrated with SAP Solution Manager in both implementation and solution operations.

- Simplify implementation further—EVERY implementation starts with best practice content based on pre-assembled RDS.

Phase 1: Project Preparation

This phase is about the initial planning and preparation to set ASAP goals. The phase follows the following three steps:

1. Clarifying scope of implementation.

2. Establishing the team—committees, teams (core, project, and consulting).

3. Defining the sequence of project implementation (SAP America, 2004).

Phase 2: Business Blueprint

The aim of this phase is to arrive at a common understanding concerned with the procedures intended to support the project and run SAP. The Business Blueprint is a detailed documentation of all requirements arrived at during the initial brainstorming and initiation workshops. This is also where the project team revises its objectives and goals while setting a schedule for each (SAP America, 2004).

Phase 3: Realization

This phase is concerned with implementation of all business process requirements and is based upon Phase 2. Two work packages define the system configuration methodology: Baseline, concerned with the major scope and Final Configuration, concerned with the remaining scope. Further, project managers need to come up with configuration documentation to be signed off by the client (SAP America, 2004).

Unit Testing—Core team members along with end-users will test whether the postings done in SAP is resulting as per the requirements of the organization test whether the output documents such as purchase order, invoice document are printed in the required format and showing the correct data it also has various testing process like Technical Unit testing where developments those are developed particularly like user exit, custom program, interface enhancements made are tested in this session. A successful test only proves the developed code works and that it performed the process as designed. And the next one is functional unit testing it is usually testing the configuration that was done ,usually use actual data or data that is masked but essentially the same as a real data set. A successful test shows that the development or configuration works as designed and the data is accurate as a result.

Integrating Testing it is development or configuration of any function that was developed within the process that integrated in to standard SAP system. The test conducted with a primarily purpose to examine all data involved across all modules. A successful test indicates that the processes work as designed and integrate with other functions without causing any problems in any integrated areas.

Regression Testing is kind of testing that verifies the new configuration made which may or may not impact the existing functionality and this is done on each phase of testing. So, testing existing functionality to make sure that it still works as expected with the newly updated configuration. So, whatever testing that is done, is in a quality environment.

SAP End-to-End Testing similar to scenario testing in that a specific business case is tested from start to finish and includes running of interfaces, reports, manual inputs, workflow, etc. major purpose of this is to simulating a real world business process and in order to make it to real world scenario. It is testing based on all the master data from starting step to the last step in the flow process cycle of Procure to Pay which in this scenario of Material Management.

Phase 4: Final Preparation

The final preparation involves testing, system management, cut over activities and end user training that showcases the team's readiness to go 'live.' This phase serves to answer all critical issues concerning the project management. Successful completion of Final Preparation ensures that the business ready to be run on the live SAP System (SAP America, 2004)

The Go-live phase is the journey from a pre-production environment to a live project operation. The most critical elements in this phase concerns with the setting up of production support, monitor system transactions and optimize the system performance.

Summary

In this chapter, we saw all the detailed literature and methodology of SAP Implementation. It also explained the problem in detail and focused mainly on what kind of solution SAP provided to solve some of the business process in mobility space. It explained in a detailed step-by-step procedure the ASAP methodology from project preparation phase to Go-live phase.

Chapter III

METHODOLOGY

Introduction

This chapter gives a description of the framework of the project and the design of the project. It explains the development of the software and how it was implemented into the current Business SAP system is discussed in this chapter.

Design of Study

Agile software development refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional team, the art of agile development (Shore, 2007).

The agile methodology provides frequent and early opportunities to see the work being delivered, and to make decisions and changes throughout the development project. The user of this methodology gains a strong sense of ownership by working extensively and directly with the project team throughout the project. Development is often more user-focused, likely a result of more and frequent direction from the customer (Shore, 2007).

There are many advantages related to this methodology and they are:

1. Change can be made even after the initial planning.

2. Program in this methodology can be re-written and adjusted as per the requirements.

3. It allows client to make every change necessary and add new features that match and update to latest developments in the industry.

4. The testing at the end of each step will ensure that bugs are identified and taken care of development cycle

5. Products can be launched at any stage or any end of cycle.

This agile methodology can be used when (a) rapid production is more important along with quality, (b) visibility for clients to monitor the scope of the project, (c) when the initial picture is not a clear picture of what the final product should look like, and (d) when skilled labor that is adaptable and able to think differently.

ASAP Methodology for Asset Management and Work Force Implementation has five standard steps: (a) Project Planning, (b) Business Blue Print, (c) Realization, (d) Final Preparation and (e) Go Live and Support.

Project planning or preparation is the initial planning stage of the project. Only client management and implementation partners are involved during this stage, In the project preparation phase, gathered user license information based on the number of end users using the application. Initially, the client decided to buy 850 tech licenses from SAP and to renew it yearly based on usage and business requirements

The End User is the employee of the client who does end-to-end operations. During project preparation based on the business needs and load requirements, it was concluded that they would have a three-tiered architecture to implement mobility solution.

The Development Server will be used to configure the clients daily business needs, it will be mainly used by the consultant to develop new solutions

The Quality Server will be used to test the scenario; the quality server is used by the consultant and the core business users to test the scenarios after development.

The Production Server will be used for day-to-day live transactions. Infrastructures like to buy systems and mobile devices are decided by client in this stage, number of PCs will be

purchased based on the number of user license. The Client bought 900 systems and devices and the same number of licenses from the SAP for one year.

Implementation Partners: In this stage, client and implementation partner figured out how many consultants needed to involve in this project. After number of meetings it was decided to keep 50 consultants including both technical and functional. The roles of each consultant is clearly documented and signed by both parties for not to have conflicts after Go-live on increasing responsibilities of the clients.

Consultant Facilities are discussed in this stage as this is a global project, travel and food expenses are included.

A Kick-Off Meeting was held and discussed introduction on the client business process, competency's, key areas, goals and expectancy from the SAP Mobility solution, discussed rules and regulations of the client, roles and responsibilities of the client.

A Business Blue Print is the send stage of the project. Implementation partner and client worked closely to make this stage successful as result and outcome of the project relied on Business blue print stage. We categorized business blue print stage into three stages.

Gathered Business Requirements are based on the questionnaire provided by the implementation partners. Visited core users place every day to gather and document business needs and current business process, identified how many schedulers are currently working at the client to do scheduling the jobs, identified technicians, and entered their information into SAP. Every single day they gathered information from client asking sequential questions on the questionnaire.

Every day after completion of requirement gathering, we came back to our work place and prepared AS-IS document. An AS-IS Document consists of present business process of the client whatever core user explained.

After completion of requirement gathering, we prepared a Business Blue Print document, it consists of as-is and to-be documented business process of the current scenarios and how it is going to be in SAP.

We found some GAPS while preparing To-be document. Some of the client's business process we were not able to find solution in standard SAP. We identified some of the GAPS and prepared GAP analysis document which consists of problems in client's business process while implementing SAP solution, discussed alternative solutions, efforts has put by technical and functional teams to fill the GAP. We identified some of the GAPS below

Refurbishment Process: The refurbishment process of repairable spares is important for client business process, for which system availability is a critical factor and for which repairable spares guarantee a high level of system availability. The refurbishment of—usually high value— faulty repairable spares is of considerable economic importance for these companies and is often a core process in Plant Maintenance. It is often much more cost-effective than a brand new purchase (Stengl & Ematinger, 2001).

In production plants or other technical objects, high value components are often used (pumps, motors, and so on) which are replaced in case of damage by a functional repairable spare and then refurbished using a separate order.

In addition to the functions for Plant Maintenance, functions from inventory management and materials planning are also used for the refurbishment of repairable spares.
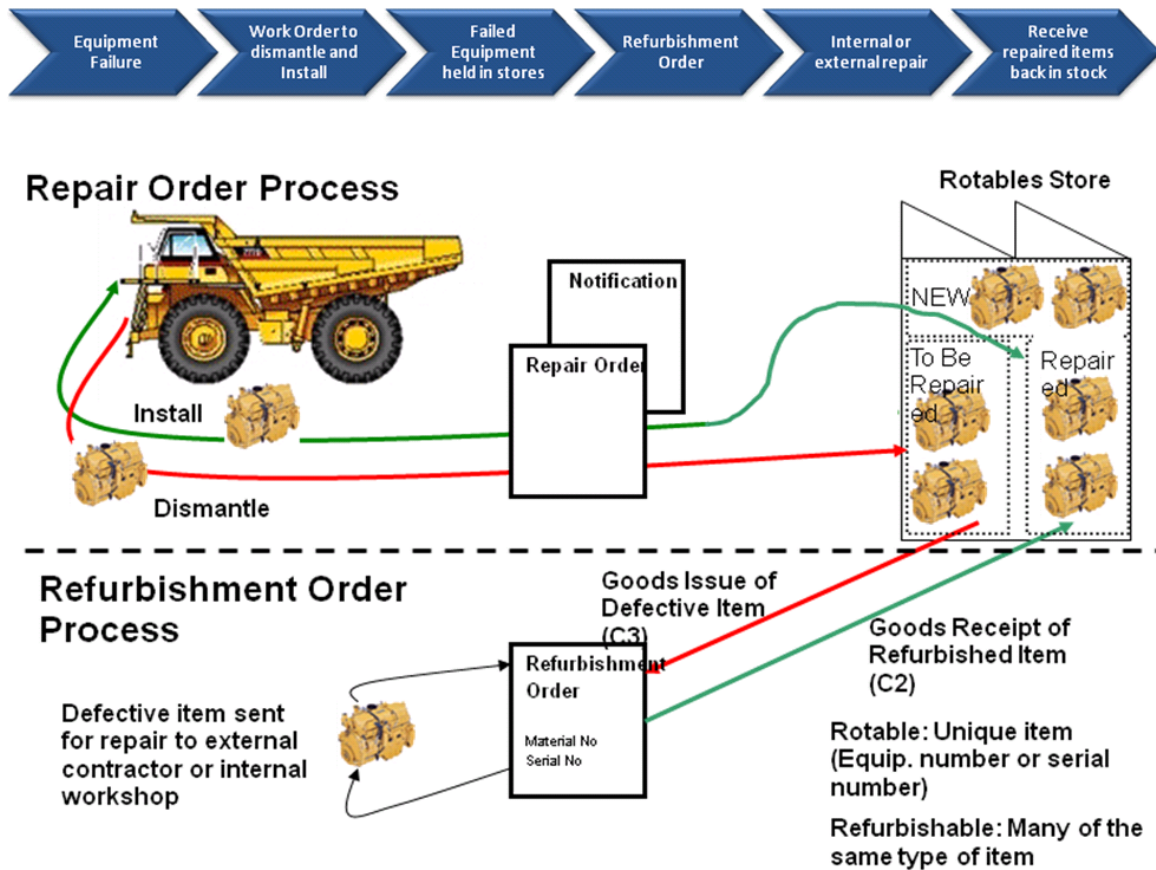
Figure 6. Repair Order Process

We were not able to map refurbishment process into SAP Mobility, still facing some of the technical issues. Refurbishment process is due implementation in mid-2016.

Business Blue Print Sign off Document: After completing BBP document, it was sent to client top management to provide their approval.

Client Breakdown Scenario: This client's business scenario described the process which occurs when maintenance tasks are executed that usually precede a malfunction at a technical object, for example:

- Malfunctions that seriously endanger further production (processing of emergency tasks).

- Malfunctions that do not seriously endanger further production, but that should be

  rectified in the medium term to restore the optimal condition of the system.
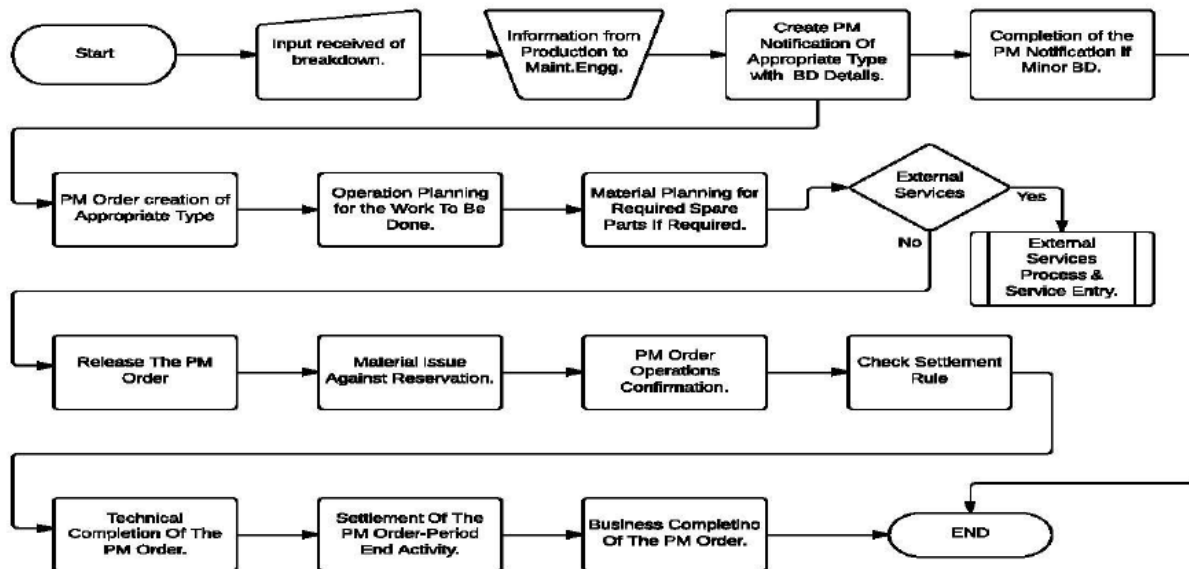
Figure 7. Client Breakdown Process Scenario

Calibration: In this process, client creates an equipment master record for a measurement

instrument. When client schedule a maintenance plan, he create a maintenance order and an

inspection lot for the calibration of the measurement instrument. Measurement results are

recorded in the inspection lot. The system proposes the status "unrestricted-use" for the

measuring instrument because the test results lied within the tolerance range.
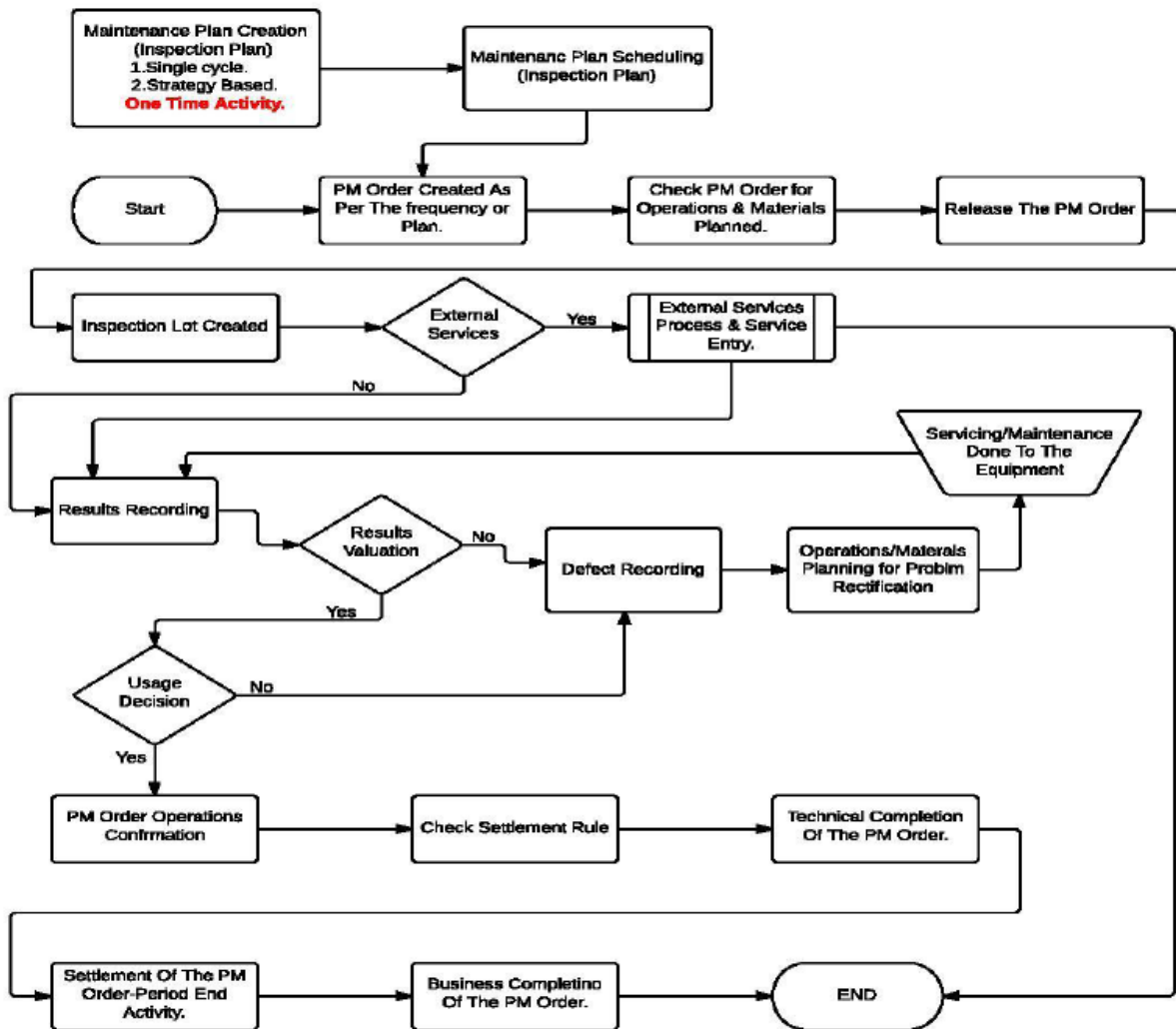
Figure 8. Preventive Maintenance Detailed Flow Chart View

    Preventive Maintenance: This scenario describes the planning and processing of periodic

maintenance tasks at technical objects. Preventive maintenance is the generic term used for

inspections, maintenance and planned repair tasks, in other words, maintenance tasks that are

repeated regularly (Stengl & Ematinger, 2001).

Further reasons for preventive maintenance can include (a) legal regulations, (b) environmental requirements, (c) De facto regulations from customers, and (d) quality assurance of products manufactured at a technical system.
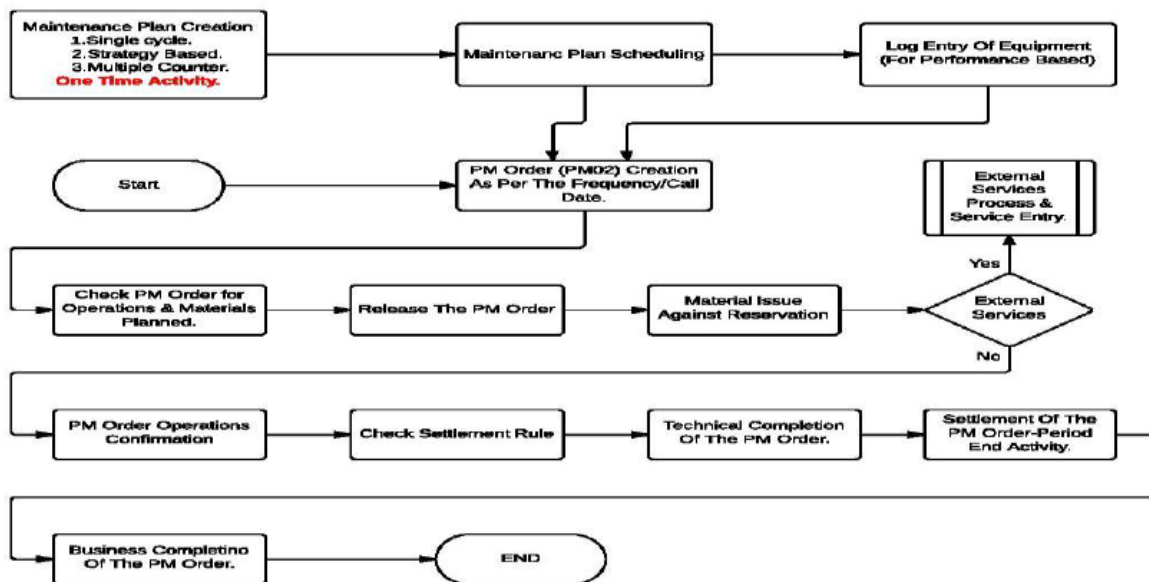
Figure 9. Client Preventive Maintenance Process

Normal Business Flow:
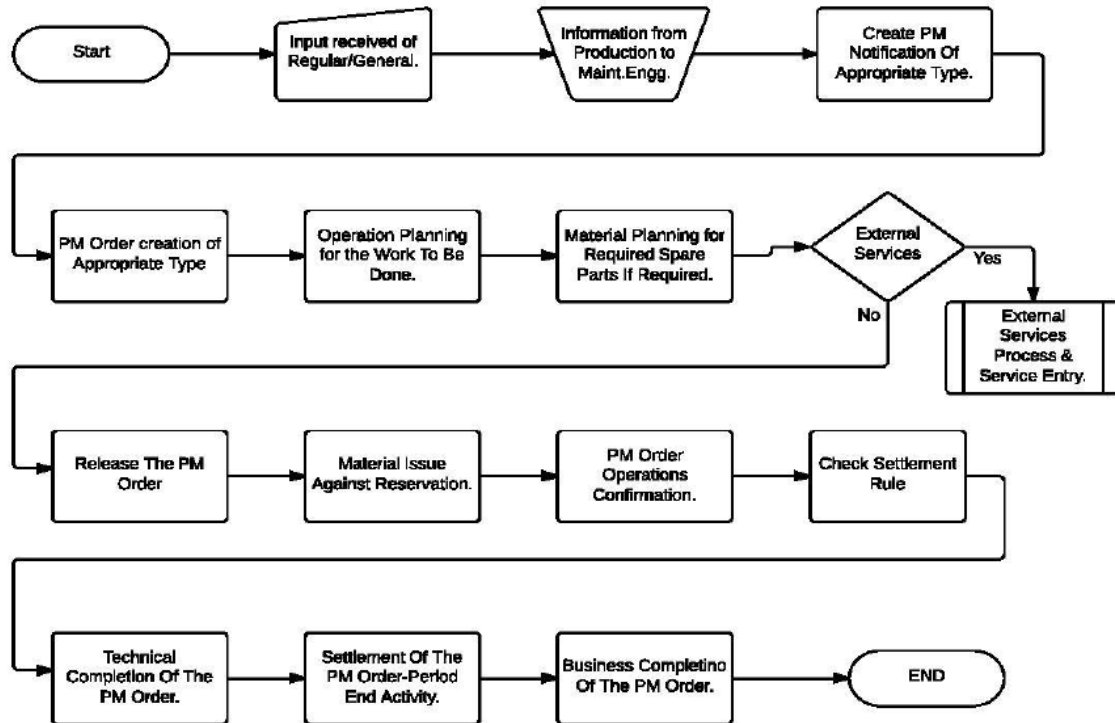
Figure 10. Normal Plant Maintenance Business Flow

      Realization Phase: In this phase, identified configuration to be processesd into SAP or mapping the client business process in to SAP,Reliazation phase started at development stage and ended at Production server.
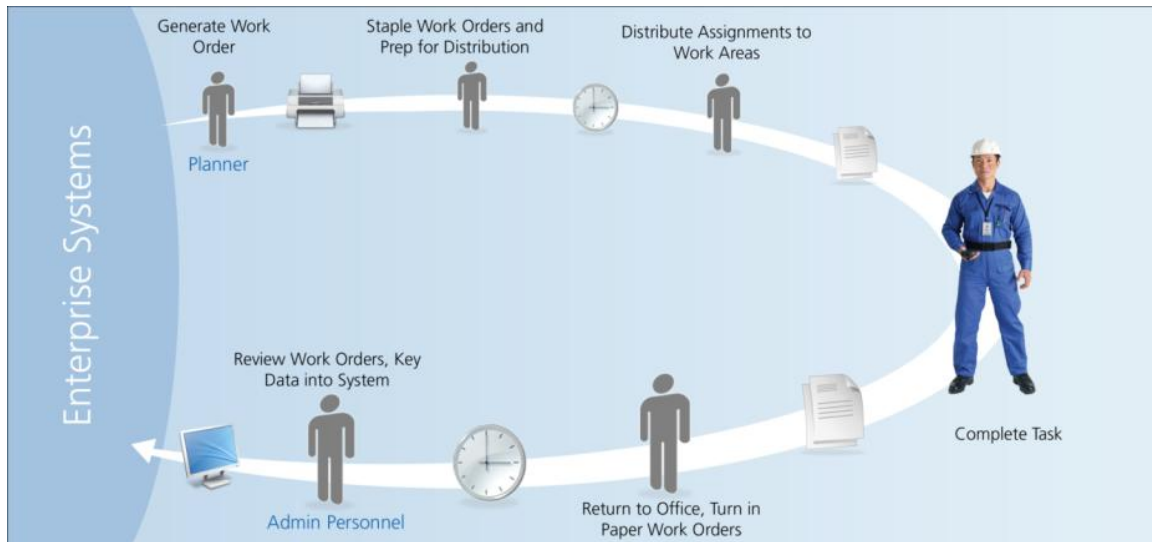
Figure 11. Client Business Process Structure Before and After Mobility Implementation

Configuration is classified into two standard types:

1. Baseline Configuration: This is very specific to the module, for which no need to

   depend on the other teams for integration.

2. Final Configuration: for this configuration we have to depend mainly on other team

   help. Client did base line configuration and then final configuration, developed a

   system that creates a transport requests for any change created in the development

   servers.

Transport Request is of two types:

1. Workbench Requests: Workbench requests are for transporting objects, programs and

   functional modules and repository files.

2. Customization Requests: Whereas customization requests are for transporting

   Customization data entered into customization tables from one system to another.

Consultant Roles in Transportation of requests: Consultant have to release all the transportation requests and put in a excel file and this excel file has to send to BASIS team for further approvals. BASIS consultants will transport all the requests from one server to another. Each request consists of a parent and child request.

- Parent Request: Will help to transport the configuration from one server to another.

- Child Request: Child request will help to carry the configuration data from one server to another.

Testing Document:

- What to test?

- How to test?

- Expected results?

- Actual results?

- Status?

- Tested document number?

Testing is of two types

1. Unit Testing: Unit testing is performed for only plant maintenance module.

2. Integration Testing: Integration testing is performed with the integration scenarios of other modules like quality management.

Final Preparation: Training sessions are conducted with the help of other training partners for business users to make them familiarize with the screens and new functionalities. Core users are involved in testing the scenarios how Work Force and Asset Management performing as expected. Users provided final approval after testing.

Go-Live and Support: Officially handed over SAP Systems to client to run day-to-day transactions, all the data became live and real time, all global systems are interconnected and integrated with one other. Currently we are giving post production support.

Data Collection

All the work order data related to client and also simulation data that was created in the SAP Test and development system was collected in order to create a test data for the product to test, with respect to technical current standard available SAP program that contains tables related to Work Force and Asset Management specific fields.

Following is the table that showcases various standard SAP technical field names from where the data was pulled.

Address Data	ADCP	Person/Address Assignment (Business Address Services)
Address Data	ADRC	Addresses (Business Address Services)
Address Data	ADRCT	Address Texts (Business Address Services)
Address Data	ADRG	Assignment of Addresses to Other Address Groups (BAS)
Address Data	ADRGP	Assignment of Persons to Further Person Groups (BAS)
Address Data	ADRP	Persons (Business Address Services)
Address Data	ADRT	Communication Data Text (Business Address Services)
Address Data	ADRV	Communication Data Text (Business Address Services)
BOM	EQST	Equipment to BOM Link
BOM	STKO	BOM Header
BOM	STPO	BOM Details
BOM	TPST	Functional Location - BOM Link
BOM	MAST	Material to BOM Link
Classification	AUSP	Actual Characteristic Values
Classification	CABN	Characteristic
Classification	CAWN	Possible Characteristic Values

To analyze the gathered data, data analysis techniques were performed below tools were

required to generate new fields

- Sap logon

- Work Force Logon

The SAP logon is a windows program used to login from Windows PC which mediates

between SAP system and SAP Graphics User Interface GUI user interface this logon displays a

list of available sap systems and automatically selects servers with best response times t*he*

storage of other SAP Logon configuration files like sapmsg.ini, With SAP GUI 7.20, the

saplogon.ini and sapshortcut.ini files are stored in the roaming user application directory. The

default of this path is the SAP\Common directory:%APPDATA%\SAP\Common

The other tool that was used in displaying the output of the report to the user, where user can enjoy playing the transaction is ABAP ALV grid.

- ABAP—Advanced Business Application Programming it's a programming language for developing application and it first got initiated when SAP R/3 layered structure got introduced and even now in current Enterprise Central Component (ECC) server it runs on using objects like inheritance, encapsulation, polymorphism and persistence similar to Object Oriented Programming Structure called OOPS Java.

- ALV grid ABAP list viewer grid which gives a standard List format and user interface to all ABAP reports. ALV is created by a set of standard function modules provided by SAP.

- ALV provides a lot of inbuilt functions to our reports and some of the functions are listed below.

  1. Sorting of records

  2. Filtering of records

  3. Totals and Sub-totals

  4. Download the report output to Excel/HTML

  5. Changing the order of the columns in the report

  6. Hide the unwanted columns from the report
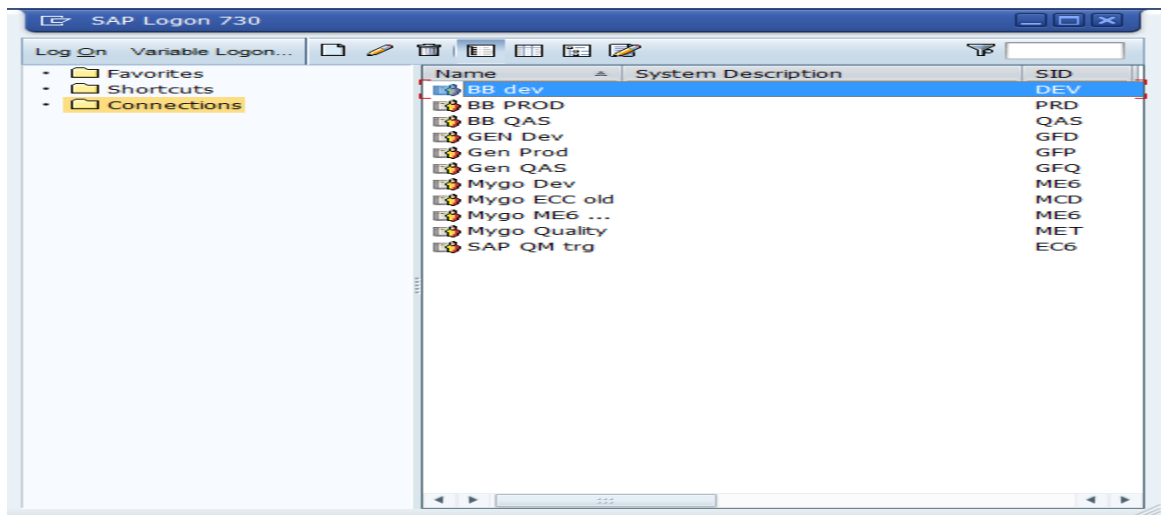
Figure 12. ABAP Editor SE38 Transaction Code

The workbench where the program is initiated, executed, and tested. SE38 (ABAP Editor) is a standard SAP transaction code available within R/3 SAP systems and even with ECC systems there are thousands of transactions exits in with standard SAP systems and finding the information related to it is very tough so this page offers a place holder for information related to so that anyone having access can comment and it is very easy and search it technical ABAP workbench development ABAP editor.

Summary

This chapter covered the analysis of how data was collected methodology involved in it , what type of Design of study was used and how it was approached. It also contains many technicality how data collected been used and it gave the completed literature overview of the procedures followed and data analyzed. Next chapter will provide additional discussion of data presentation and its analysis.

Chapter IV

DATA PRESENTATION AND ANALYSIS

Introduction

This chapter gives information about the real time data on which the calculations have to

be done and also give an idea about analyzing the data and preparing the data to perform the

calculations on it. Questions like how the objectives of the project have been achieved will be

explained in this chapter.

Data Presentation

During implementation of Work Force and Asset Management, the data which was

collected and analyzed are shown in Chapter III. In this chapter, the data collected during

implementation will be explained; the data was collected using various business tools,

techniques. Various resources are involved in data collection and analysis, data was stored sin

the shared team site which is available for each team and project managers for future references.

The data displayed with graphical user interface using different tables.

Update Interface configuration files, and deploy the changes to the production

environment. Interface configuration files include back-end connection files, and override files

(localization files, query files, and constants files). Configuration files may apply to the

landscape, or to a particular application. In some cases, you must restart SAP Mobile Platform

Server before the changes take effect.

- Developers create configuration files as part of application development. This

  typically involves copying and renaming a template file to use as a base. For example,

use the ClientTextBase.ini template file to create ClientText.ini, then modify

ClientText.ini to change the configuration settings.

- Once the configuration files are published to SAP Mobile Platform Server, they are

  stored in the database.

- Administrators can update configuration files, or work with developers to update

  them. The updated files must be republished using Interface Editor and Management

  Cockpit.

  o Changes to configuration items that are not related to a configuration file do not

    require a server restart. For example, changing a database connection name in the

    SQL back end.

  o Changes to configuration items that are related to a configuration file do require a

    server restart. For example, changing the content of an existing file, like

    SqlBE.ini, or changing the Query Unit File of a SQL back end from SqlBE.ini to

    SqlBE_Oracle.ini.

  o Changes to actual code require a server restart. For example, changing Java code

    for the Java back end.

  o Changes to the SQL query files require a server restart, if the SQL back end's

    preload Queries setting is true.

  o Updates to application configuration files. A new version of the application that

    includes updated configuration files is published from one server in the cluster,

    you must restart each SAP Mobile Platform Server in the cluster to receive the

    new configuration files.

The previous steps need to be configured in order to see Work Force and Asset

Management specific fields.

Table 1

Plant Maintenance Table Showing Work Force Fields After Implementation

Table 2

Data Before Implementation of Work Force and Asset Management

When we can see for the same plant before and after implementation of Operation

Efficiency Work Force, we can easily identify the difference between the work hours before and

after implementation, For the same work in the past it took 111.00 man hours to start and execute

and closure of the work, The same work after implementation of Asset Management and Work

Force we can see it drastically reduced to 66.50 hours.

Figure 13. Work Force Technical Completion Screen

Following is a detailed explanation of technical information:

Table 3

Fields Used from SAP to Work Force and Asset Management

Configuration Tables	Description
CSKS	Cost Center Master Data
CSSL	Cost Center / Activity Type Assignment
T001W	Plant
T006	Unit of Measure
T024I	Maintenance Planner Groups
T352B	Catalog Profile
T357	Plant Section
T370C	ABC Indicator
T370F	Functional Location Category
T370S	Functional Location Structure Indicator
T399I	Planning Plant
T430	Operation/Activity Control Key
T499S	Location Codes
TC21	Standard Value Key
TC23	Work Center Usage
TC24	Work Center Person Responsible
TC25	Work Center Capacity Other Formula
TC26	Work Center Capacity Category
TC27	Work Center Capacity Planner Gorup
TC30	Work Center Category
TC38A	Work Center Shift Sequence
TGSB	Business Area

Data Analysis

After careful study of the above results and interpretation of some of the user data, 85% of work is now planned and preventive work orders, mobile induction reduced emergency work orders by 5%. For some of the plants it saved $790/weekly in paper costs and data entry 40,000 annually and effectiveness of workers doubled in the first year, saved 20 minutes of time per technician per shift. Mobility reduced number of technicians performing critical response maintenance from 14 to 9, the additional five positions were shifted to Preventive maintenance, and Physical counts are now 99.9% accurate.

Code Changes: To Override GET_WORK_ORDER_OBJECT_LIST method of class YCL_PM_WORKORDER_DO. Copy original code from method to new method, but add the following to the existing code:

LOOP AT lt_iriwol ASSIGNING <ls_iriwol>. MOVE-CORRESPONDING <ls_iriwol> TO ls_objectlist. "#EC ENHOK MOVE <ls_wo_header>-aufnr TO ls_objectlist-aufnr.

***** Add this new code *****

IF <ls_iriwol>-iloan IS INITIAL.

SELECT SINGLE iloan FROM equz

INTO <ls_iriwol>-iloan

WHERE equnr = <ls_iriwol>-equnr.

ENDIF.

SELECT msgrp eqfnr FROM iloa

INTO (ls_objectlist-msgrp,

ls_objectlist-eqfnr)

WHERE iloan = <ls_iriwol>-iloan.

Summary

This chapter explains how the data is pulled from Standard SAP to Interface environment, how to generate Work Force and Asset Management specific fields. In the last step it helps us to understand coding techniques being used to transportation of tables in between two clients, Finally, it explains how the data is being pulled from SAP to Interface and how business able to access and interpret data to take better decisions in day today tasks, It also explain different table names and technical names those are involved to pull the data and loop them and link together to get the desired output.

Time Line:

October 2014—January: Project Preparation
January–April: 2015: Business Blue Print
April 2015–June: Realization
June 2015–August: Final Preparation
October 15 2015–Go Live
November 4th 2015—Defense

Chapter V

RESULTS, CONCLUSION, AND RECOMMENDATIONS

Introduction

This chapter explains the ability to utilize data, and react quickly to what the data tells us, is necessary to compete. This is done by making use of numerous techniques of exploration which is already discussed in the preceding chapters. To complete the development of analysis successfully, the necessary information was gathered from dashboards, scoreboards, annual status reports.

Results

After the project is implemented, the workforce able to use SAP Work Force and Asset Management to do day-to-day transactions on mobile devices, which increased plant and equipment performance, improved workforce productivity and safety. Work Force reduced overtime and cost of maintenance and promoted a 360° view of operations. Asset Management reduced unplanned downtime. After installing Work Force, business can generate notifications and work orders on-the-spot.

Some of the added benefits included.

- Manage parts and inventories

- Perform cycle counts

- Receive, transfer, issue and adjust

- Manage parts during inspections, maintenance, repairs.

- Saved $275,000 in inventory carrying costs by maintaining just in time inventory

- Cycle counts are now done in an hour every day, saving 45 man hours a week.

- Great return on investment by reducing inventory costs and material shrinkage with regular daily mobile monitoring.

- Physical counts are now 99.9% accurate.

- Saved nearly 175,000 in operating costs by doing away with manual timesheets.

- 90% of work now is planned and preventive work orders.

- Tracking the condition of assets with mobile instead of paper has resulted in lower maintenance costs, improved planned maintenance and fewer production upsets.

- Gave technicians the ability to see all history, inventory levels, safety guidelines and more differences between the old SAP standard report and current development.
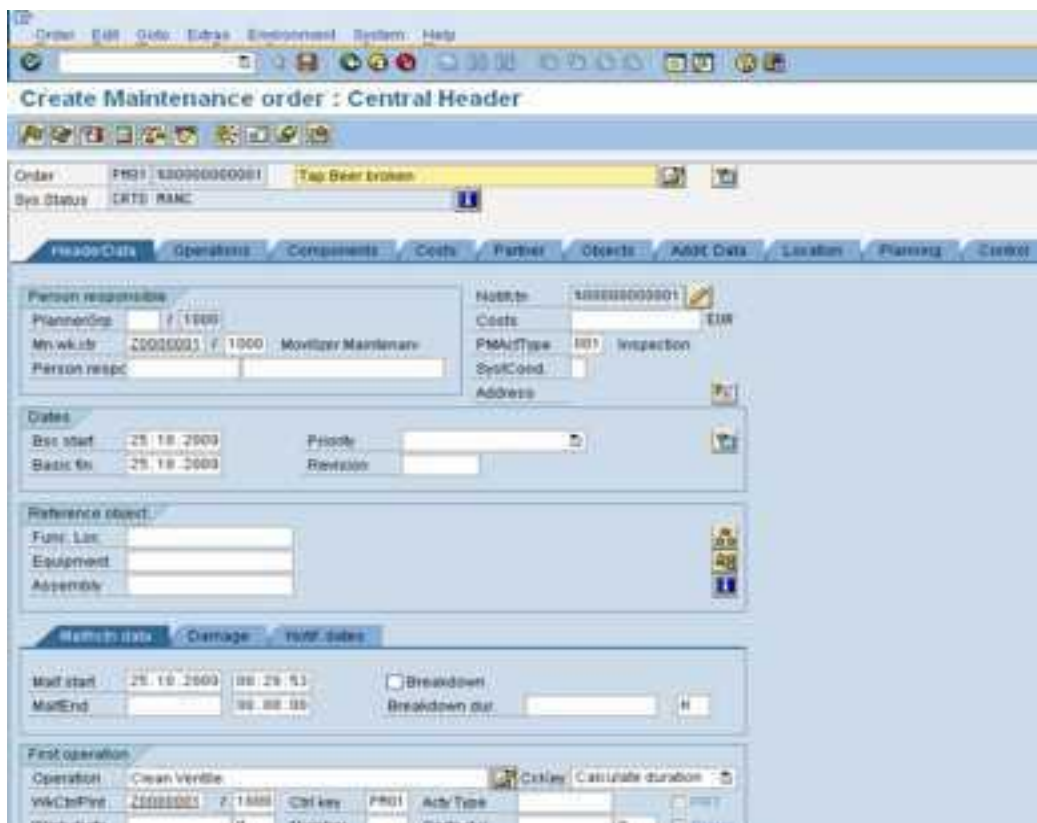
Figure 14. Differences between the Old SAP Standard Report and Current Development
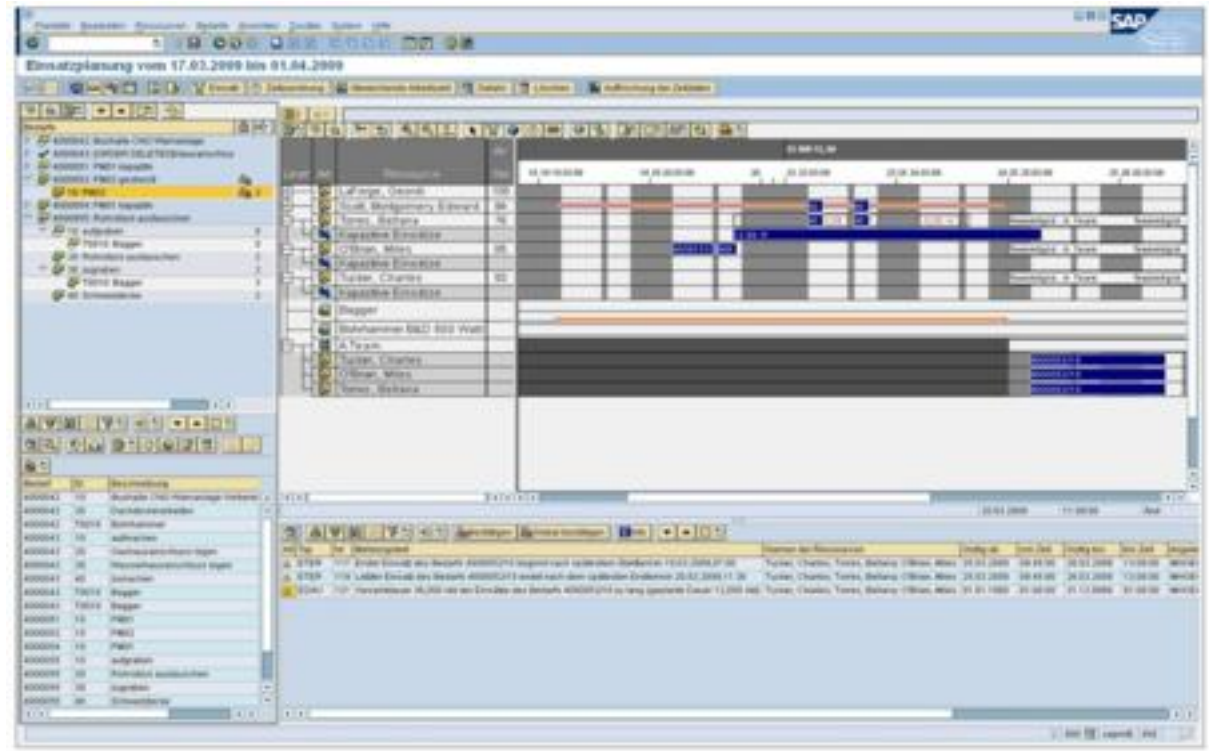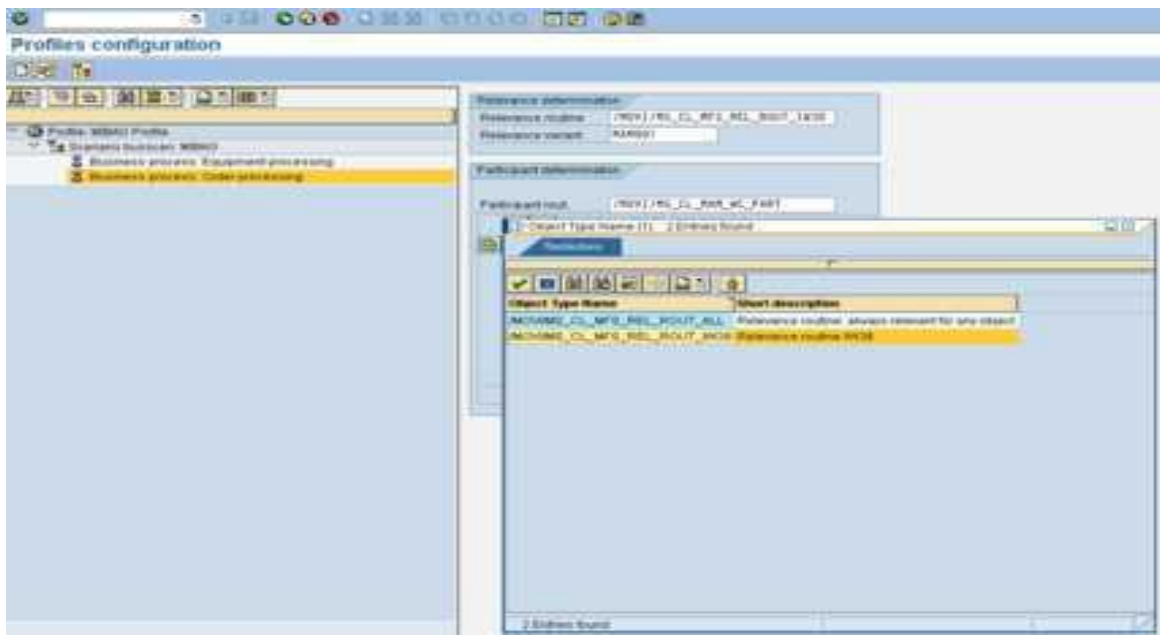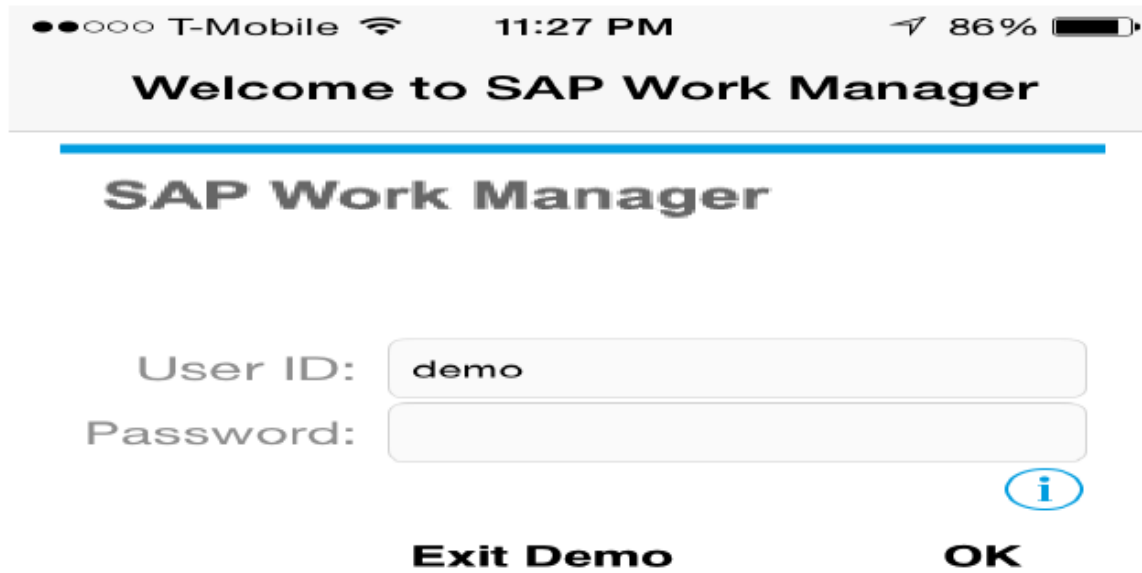
Figure 15. After Implementing Work Force and Asset Management

Login: Work Force

Figure 16. SAP Operation Efficiency Login Pad

Creation of Order and Synchronization with Interface Client:

Figure 17. Creation of Order

Attachments:
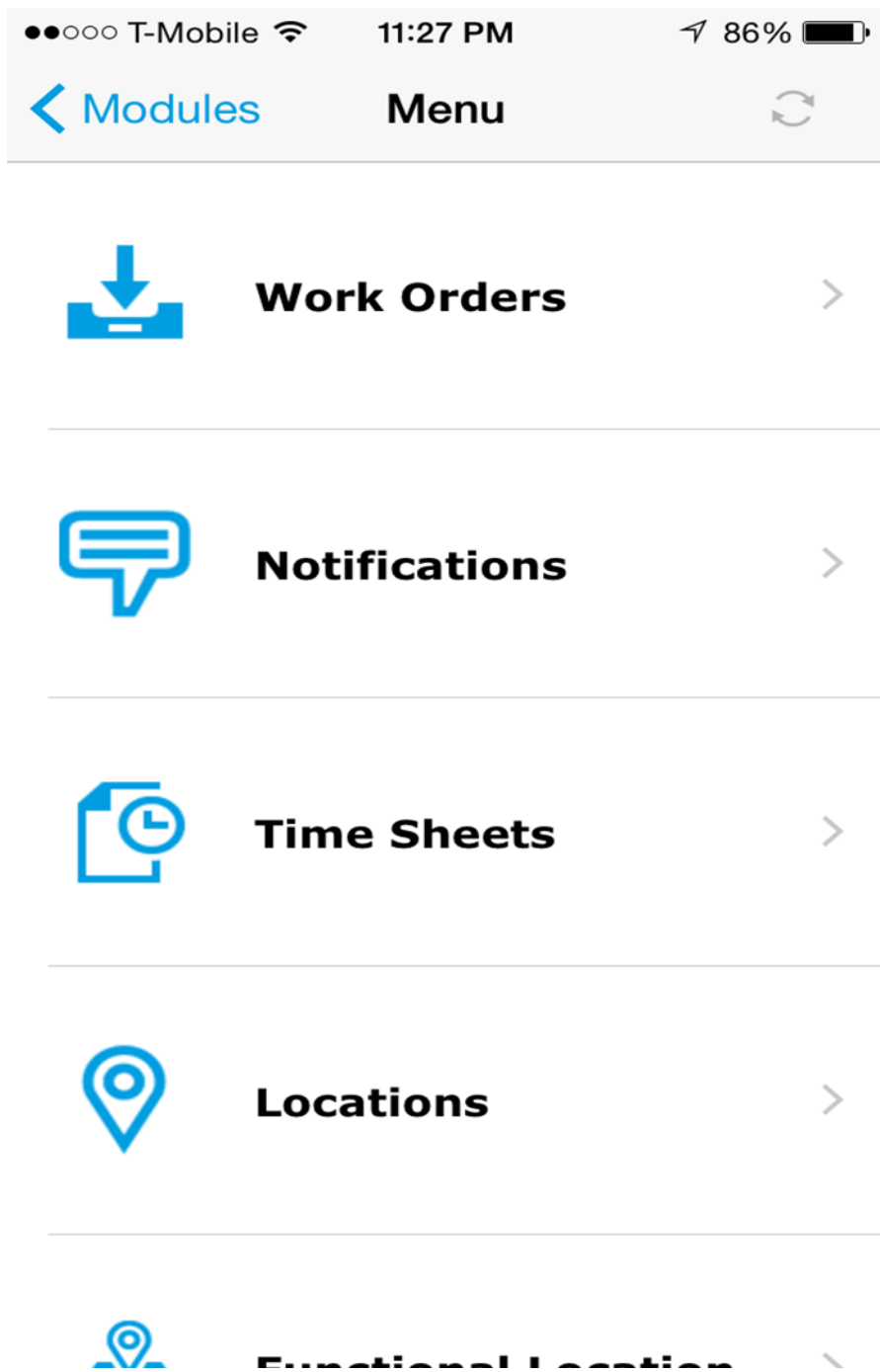
Figure 18. Attachments to Mobile Device

Compiling and Saving:

Figure 19. Compiling of SAP and Interface

Conclusion

Work Force and Asset Management allows client to maximize the power of SAP and other backend system data with mobile technology. Mobility allowed client to extend detailed, up to the second information from SAP system to the filed, giving remote workers the data they need to make the right decisions the first time. Mobility enhanced operational visibility with

improved data quality and multiple connectivity options, Optimized field crews productivity and SAP system with better faster data flow. Mobility solution increased work force productivity and increased first time fix rates and overall throughput with instant access to data. After implementation of mobility, client eliminated end of shift data entry in to SAP System. Business was able to capture more accurate data to implement preventive maintenance and reliable maintenance strategies resulting in longer asset life.

Recommendations

1. Mobility allows more interfaces which allows SAP to become more vulnerable to new external security risks, before installing and Go-live business have to define new security policy for all people who uses mobility and need to check critical authorization and have to install security patches and notes.

2. SAP mobility solution does not allow reading of standard SAP reports in mobile devices. We have to change existing SAP Codes to suite mobility interface for some functionalities.

3. Operation efficiency mobility will not allow to mass schedule of work orders or mass change in a single screen, In SAP we can do mass change. With the implementation of Prometheus plant maintenance software, we can overcome this by addition of new tables and fields to the Interface platform.

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