January 30, 2013

22761 Forest Ridge Drive
Lakeville, MN 55044
(PH) 704-905-5175
www.r3now.com

Expert Witness Report

SAP Retail Inc.

v.

Minnesota Commissioner of Revenue

Prepared by: **Bill Wood**
President

Table of Contents

Qualifications

My name is Bill Wood. I am the owner of R3Now Consulting, providing SAP software services.

My Information Technology ("IT") experience goes back to the mid 1980's [1] when I worked for Stanton Industries as the Production and Plant Manager. In the mid 1980's I instituted the use of Personal Computer technology with early Microsoft Excel spreadsheets to build a homegrown MRP (Material Requirements Planning) system.

In the early 1990's I went to work for AT&T at a manufacturing facility in Phoenix, Arizona. During my time at AT&T, I attended Novell Netware Engineering Certification courses (early computer networking), Microsoft product training, and I provided various types of technical and computer training courses as an internal company instructor.

This AT&T manufacturing facility became a pilot facility for a new, next generation integrated business software system, called "SAP."

As part of my training responsibilities, I conducted training courses for end users using the new SAP software and helped supervisory or other leaders in the organization learn to use the software.

After going live [2] with the SAP software in 1994, I participated as part of a group of Subject Matter Experts to help ensure proper use of the software as well as working to resolve various software and user transaction-processing issues.

The manufacturing divisions of AT&T were divested into Lucent Technologies and the cable manufacturing facility in Phoenix became independent as Cable Systems International. Shortly after this transition I went back to AT&T.

I stayed on with AT&T until 1997 when I went to work for Osprey Systems (today NIIT Technologies) in Charlotte, North Carolina, performing SAP training and documentation services for various SAP customers. At Osprey, I received additional specialized SAP training in the areas of implementing SAP Sales and Distribution (SAP SD).

[1] I had explored technology since the early 1980's as a hobby working with early Radio Shack TRS80 computers and early version of Basic. Later I pursued education involving Unix, FORTRAN, and BASIC language programming.

[2] This will be explained in more detail later.

Late in 1998, Grant Thornton hired me in its Management Consulting practice in the SAP group. I received training around SAP project delivery methods. In 1999, I attended training, and received certification, for the SAP ASAP software delivery methodology [3] from the software vendor.

In late 2001, Grant Thornton sold their Management Consulting practice to Hitachi Consulting. I stayed on at Hitachi until 2005 when I went out on my own offering SAP services. During my time at both Grant Thornton in their U.S. Management Consulting practice, and later at Hitachi Consulting, I served as the SAP Knowledge Manager. Some of those responsibilities included:

- Supplementing the SAP delivered ASAP Methodology with enhancements and improvements
- Providing internal consulting guidance on SAP best practices
- Providing insight on more effective service delivery methods
- Creating a virtual collaboration network for real-time knowledge transfer across service delivery projects
- Screening of applicants and contractors to join the SAP delivery practice
- Continued SAP project implementation services and functions

While at Grant Thornton and (and earlier at Osprey Systems) I participated in various pre-sales, sales, and software selection activities. These activities included helping prospective clients develop software selection criteria, RFP documents, making proposal presentations, etc. I continue to perform these activities in my own company.

Over the course of my SAP career, I have participated in more than 20 SAP engagements in various industries and project roles (but not limited to):

- SAP license or contract negotiations
- Software & vendor selections
- SAP CoE [4] development
- SAP project management
- Organizational change management
- Integration test management
- Training and security management

[3] This is the SAP supported standard delivery approach for their software regardless of who provides the software delivery or "implementation" services.

[4] Center of Expertise or Center of Excellence. This is the support organization after an SAP project "goes live."

- SAP delivery methodology development
- Various SAP modules team leadership
- SAP upgrade projects
- SAP rollout projects
- SAP data conversions

I recently completed an SAP license and contract negotiation representing Wolters-Kluwer's interests against SAP.

Over my years doing SAP work I have performed architecture, integration, implementation, and other consulting services around various SAP modules such as: Sales and Distribution ("SD"), Materials Management ("MM"), Production Planning ("PP"), Project Systems ("PS"), Funds Management ("FM"), Finance ("FI"), Foreign Trade ("FT"), and Controlling ("CO") at various clients.

Some of that experience has included end-user and project team training in each of these modules and areas of the SAP application.

I have done ABAP [5] coding in user exits [6], pricing form routines [7], and query reports.

Since 1994, I have worked with the following SAP software versions: 2.2, 3.0, 3.1, 4.5, 4.6, 4.7, ECC 5.0, ECC 6.0 (various EHP [8] versions).

I have performed SAP consulting work for a variety of companies of various sizes and industry segments [9] including some of the largest in the world including:

> Thomson-Reuters (Media), McKesson (High Tech), U.S. Navy (Public sector), AT&T (Telecom), RJReynolds (Consumer Products), Coca-Cola Enterprises (Consumer Products), Continental General Tire (Automotive), FMC Corp

[5] ABAP is the SAP proprietary software programming language for SAP applications. There are some exceptions to the use of ABAP such as with web-enabled technologies and some third party solutions, which SAP has purchased.

[6] "User Exits" in SAP are where SAP has pre-defined places in the software programs where customers may change the data processing stream. Custom programming options are explained in more detail below.

[7] These are special locations for adding software programming to determine how pricing behaves.

[8] Version 6.0 of the software commonly referred to as "ECC" or Enterprise Core Components has several enhancement packs or "EHP's" which add additional functionality and resources.

[9] Thomson-Reuters, McKesson Provider Technologies (a wholly owned subsidiary of McKesson Pharmaceutical), and PolyVision are all providers of software, services, and / or hardware. They have similar business models to SAP as it relates to software, maintenance, and service delivery.

(Chemical), Novartis AH (Pharma), UCB (Pharma and Chemicals), Compass Group (Food Service), Arctic Cat (Automotive), SGL Carbon (Other), Hoechst Celanese (Chemical), PolyVision (Other), Getrag (Automotive), Champion Technologies (Chemical), Plastic Omnium (Automotive), DVA (Consumer Products), e-Gatematrix (Food Service).

I had previously maintained a Microsoft Partner membership until February 2010, which required developing and maintaining skills with various Microsoft server related products such as Microsoft Windows Server, Microsoft SQL (Database) server, and other Microsoft business applications.

Executive Summary of Opinion

Analysis of the following questions was performed:

(1) When SAP licenses ERP software to customers, are services from SAP necessary "to complete the sale" (i.e., license)?
(2) What does the term "installation" mean in reference to ERP software?
(3) What does the term "implementation" mean in reference to ERP software?
(4) Is "implementation" distinct from "installation"?
(5) What does the term "fabricate" mean in the ERP consulting industry, and do consultants "fabricate" software when they perform blueprinting and configuration services?

ERP systems are software packages for running business operations. SAP is the leading provider of ERP software. SAP software consists of groups of processing functions often referred to as "modules" which are delivered by SAP in a fully integrated fashion. In fact, the concept of an ERP application within the software industry has come to refer to a fully *integrated* suite of business functions.

(1) Software Sale

Once the software license contract process is executed the sales process is complete. SAP does not require its software customers to purchase services from SAP. SAP software customers have many options and alternatives, such as, installing (or implementing) the software themselves, seeking alternative service providers, or using a combination of options. SAP provides services but has only a small share of the services market. Services from SAP, or other service providers, are not necessary for SAP to complete a software license sale to a customer.

(2) Installation

Installing SAP software, although more involved than installing consumer software, is a similar process. There are "setup" screens to go through which prompt a user for more information and finally the files are unpacked, parameters are activated, and the load programs are executed. Once the software becomes accessible by a user it is installed. For SAP this is when any user can log into the SAP software.

(3) Implementation

SAP implementation is a process that determines how the SAP software will be used after it is installed. Implementation includes meetings, discussions, flowcharts, diagrams, proof of concept demonstrations, testing, data conversion, change management, and

many other activities. This is unlike the installation process and requires different skills. The entire implementation is a process "for achieving integration across departments," even when those departments and functions are global in nature.

(4) Installation vs. Implementation

Installation makes the SAP software available for use. Implementation determines how the software will be used after it is installed. The installation process is exclusively dependent on making software accessible on computer hardware. The implementation process is concerned with the business or organization interacting with the software after it is installed on the hardware. The skills and experience for installation are entirely different and involve technical skills around database management, system administration, and hardware infrastructure. The skills and experience for implementation, while they require knowledge of software settings, focus on business processes and how organizations conduct transaction processing.

(5) Fabrication

Since there is no widely accepted meaning for the term "fabrication" within the SAP software area, I have used the criteria that fabrication "alters or changes" the SAP software into something that is "new or different." The SAP software contains modules that are fully integrated as the software is delivered to the customer.

The implementation process does not alter the integration of the modules *without* doing custom software programming. Blueprinting and Configuration do not alter or change the SAP software. Configuration implements settings that are built into the pre-written software.

If custom programming is desired by the customer, such custom programming might be considered to "alter or change" the software into something that is "new or different."

Introduction

What is ERP Software?

The term "ERP" stands for Enterprise Resource Planning, which references a type and class of software with fully integrated program functionality.

> ERP systems have been defined as enterprise-wide packages that tightly integrate business functions into a single system with a shared database. They have also been characterized as comprehensive software solutions that integrate organizational processes through shared information and data flows. Thus, ERP systems are marketed as a vehicle for integrating the core business activities of an enterprise, such as finance, logistics and human resources, and as a means of overcoming problems associated with so-called "legacy systems". (Newell, Huang, Galliers, and Pan, pg. 26, 27). [10]

Much of the academic literature around ERP focuses on SAP because of the significant market share the company has in the enterprise software marketplace.

> "[Using SAP as an illustration] [w]ide spread [use] of ERP technology has made an organization shift its focus from applications development to enterprise software implementation and configuration rapidly. ERP is a platform that integrates all business functions with its centralized data repository shared by all the business processes in the integrated enterprise-wide system. Unlike other computer applications, ERP has the multidisciplinary scope of enterprise system concepts that requires internal cross-disciplinary coordination…"
>
> "[An] ERP system is a set of large and complex database and data warehouse applications that provide the data necessary for the enterprise business processes. All ERP systems are heavily dependent on [a] centralized data repository" (Wang, Xuesong, and Hwang, pg. 392). [11, 12]

[10] Newell, S., Huang, J., Galliers, R., and Pan, S. "Implementing Enterprise Resource Planning and Knowledge Management Systems in Tandem: Fostering Efficiency and Innovation Complementarity." *Information and Organization* 13, no. 1 (2003): 25-52.

[11] Wang, M., Xuesong, Z., and Hwang, D. "Object Data Reuse and Integration in ERP." *financial management* 12, no. 1 (2011): 392-400.

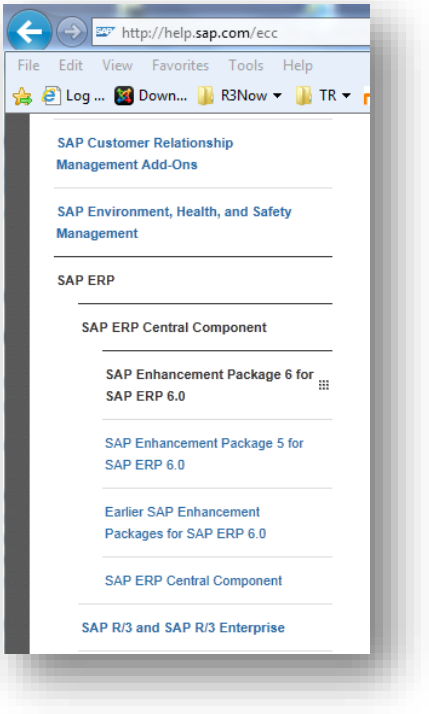
[12] See also page 198, Constantin, D. "ERP inside Large Organizations." *Informatica Economica* 14, no. 4 (2010): 196-208 ("ERP (Enterprise Resource Planning) has a different approach in supporting the business. It is integrated. All the… different functionalities are working and communicating together as a single platform, exchanging information and depending one on another… ERP has several modules supporting different functions but they are integrated…")

SAP the Company and the Software

SAP is a term, which describes both the company and its software products. Software industry references to "SAP" refer to either the software product or the company. This is common and depends on the context in which the term "SAP" is used.

Very Brief History of the SAP Name and the Company [13]

SAP is defined in literal terms from a German translation of *Systeme, Anwendungen und Produkte in der Datenverarbeitung* as **S**ystems, **A**pplications, and **P**roducts in Data Processing. The company has offered a number of different ERP software products over the years. These include its R/1, R/2 and R/3 products. In the early 2000s, there was a change in product design, approach, and architecture from the "R3" versions and the **E**RP **C**entral **C**omponent (SAP ECC) was introduced. [14]



What are Modules in SAP ERP Software?

SAP ERP software is an integrated set of business solutions arranged into "modules." These modules are specific to, and named for, the business activities they support; they are included in the SAP ERP package that is licensed. Modules are collections of software programs, which are pre-written, to work together as an integrated whole. For example, some of the SAP modules include:

- SD – Sales & Distribution
- MM – Materials Management
- FI – Finance
- PP – Production Planning
- PM – Plant Maintenance
- CO – Controlling

There are "sub-modules" which are large portions of system functionality separately arranged under a primary module. For example, Asset Management (or "AM") is a sub-module to FI --, referred to as FI-AM. There are also "cross-functional" modules

[13] German SAP web site - http://www.sap.com/germany/about/company/geschichte/geschichte_1.epx; Wikipedia SAP Germany History - http://en.wikipedia.org/wiki/SAP_AG (retrieved November 24, 2012).

[14] For example, see the included graphic which shows the relationship from the current SAP help documentation located at http://help.sap.com/ecc (retrieved November 24, 2012).

including functionality that applies to more than one primary module. For example, items like "Batch Management" are available in SD, PP, or MM.

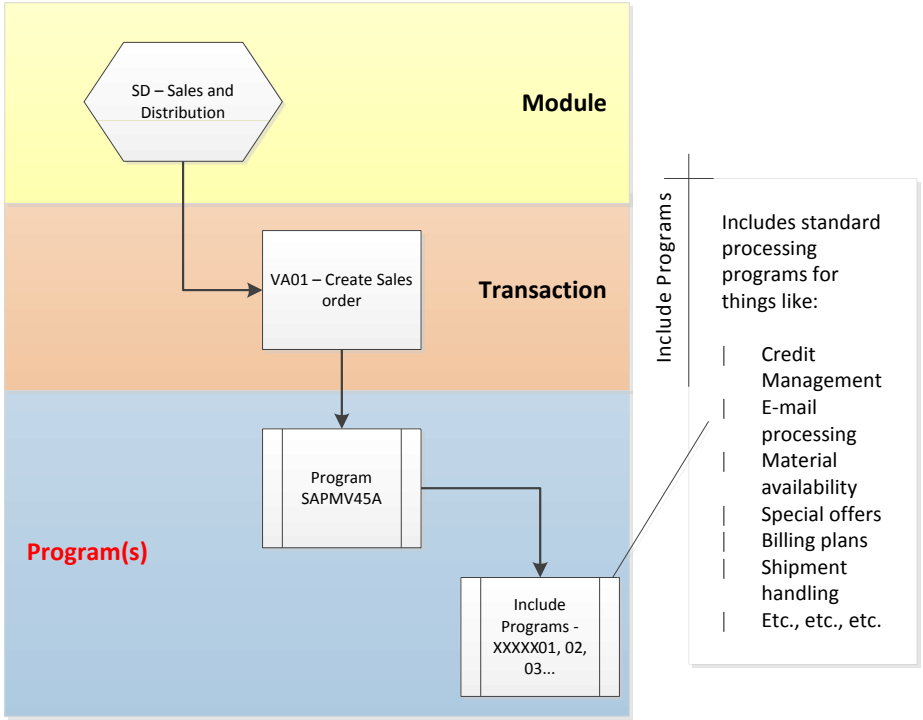
However, even though SAP has divided the software application into logical groupings for processing purposes (i.e. modules); the modules are fully integrated in SAP software as it is licensed "out of the box." Making a system parameter change (i.e. functional configuration) after the software is already set up and installed, does not alter any programs and does not "string together" any modules. All of the software programming and coding is already connected and integrated. This "integration" has made SAP software popular in the business world. The idea of a single "integrated" software solution has permeated the SAP literature, marketing material, and the industry for many years.

SAP modules are collections of programs, representing a set of related business functions, accessed by codes called "transactions," which are already integrated in the SAP software "out of the box."

A Single Module Example (Sales and Distribution)

A "module" in SAP is a set or collection of business functions represented by "transaction" codes. For example in Sales and Distribution (SD) these transaction codes perform business functions such as Create a Sales Order (transaction code VA01), Create an Invoice (transaction code VF01), release sales order credit hold (VKM3), Create a new customer (XD01), etc.

Within the SD module, there are thousands of prewritten software programs representing hundreds of transaction codes. Each transaction code has a program assigned, and this "main" program assigned to the transaction code may have a collection of dozens, or in some cases, even hundreds of "sub" programs called "includes" which make up the larger program.



This level of functionality is prewritten and all of the integrated processes between modules already exist once the software is installed.

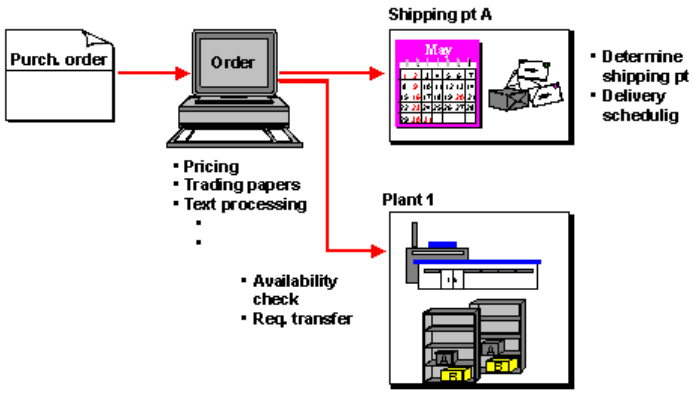
The SAP online help provides a brief example of a simple order process, where the program functionality is already in existence and the "modules" come "pre-assembled" from SAP. [15] Numerous "functions" and "modules" are already strung together in the pre-written software. The full integration is built-in and this integration has long been one of SAP's major selling points.

In sales order processing, the system implements various functions:

In the sales order, functions such as pricing and printouts are available. The system checks whether the material is available for the requested delivery date and if necessary, transfers the requirements to materials planning. The system generates shipping dates and points in delivery scheduling.

Another part of this component are the special sales order types - rush orders and cash sales. (For more information, see Special Sales Orders.)

- In cash sales the goods are paid for in cash.
- In a rush order transaction, the customer picks up the goods or you deliver the goods on the same day as the order is placed. However, the invoice is created later.



Standard Functions During Order Processing

When you process a sales order using the standard version of the SAP R/3 System, the system can automatically carry out basic functions, such as the following:

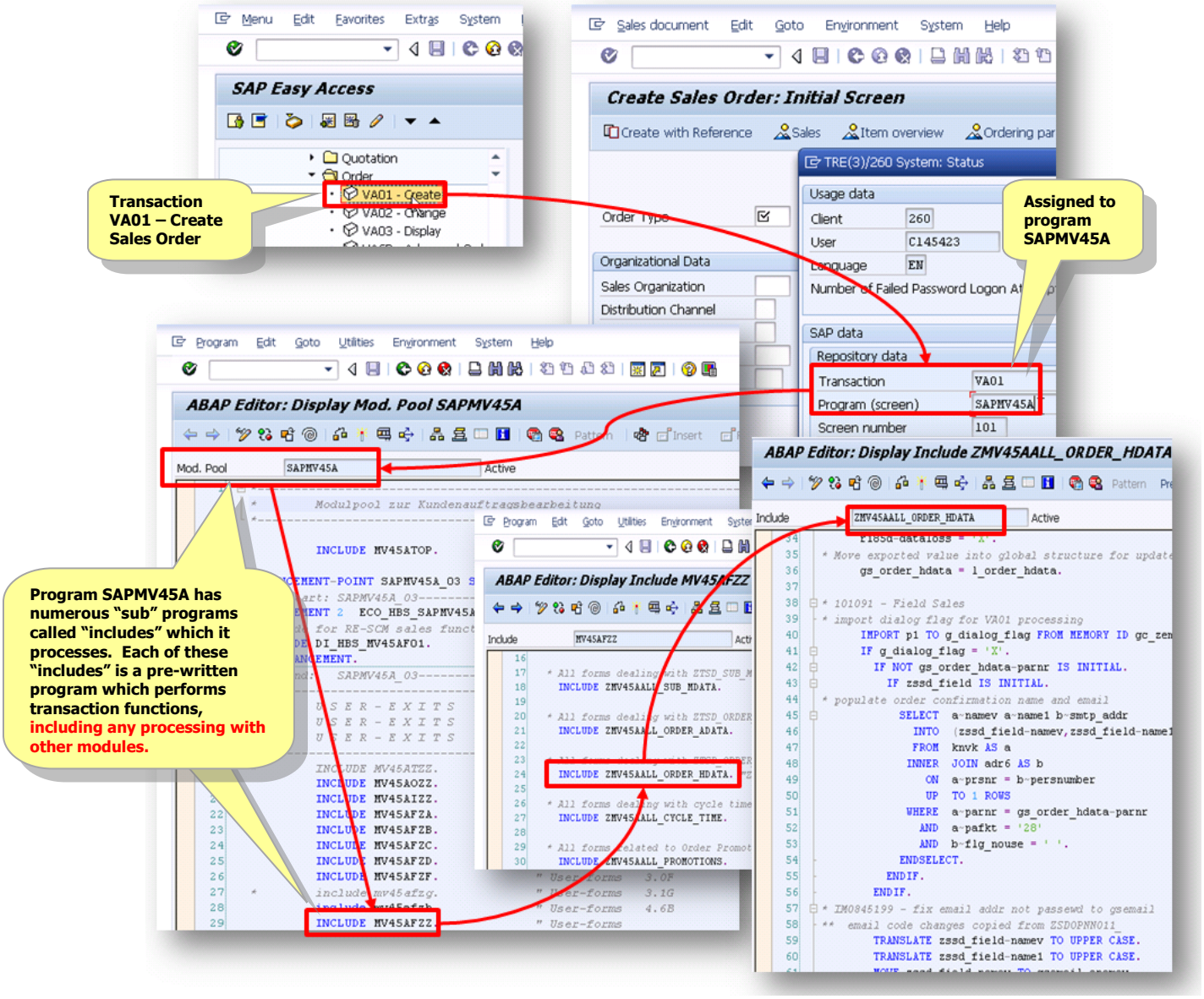
- Pricing
- Availability check (if this function is defined in the material master record)
- Transferring requirements to materials planning (MRP)
- Delivery scheduling
- Shipping point and route determination
- Credit limit check

Following are images of SAP application programming for one (1) transaction code to create a sales order. In the Sales and Distribution module there are over 100 transactions that can be processed depending on customer requirements. Within these transactions all

[15] SAP Online Help for ECC 6.0 (retrieved November 27, 2012) http://help.sap.com/erp2005_ehp_06/helpdata/en/33/00f9c39d6911d194e200a0c9306794/content.htm?frameset=/en/dd/55fa7a545a11d1a7020000e829fd11/frameset.htm

of the interaction between the other modules is *already* "strung together" in the software as it is licensed out of the box. The integration comes pre-delivered.

The following visual illustration shows the program flow of the VA01 Create Sales order transaction. There is a program assigned at the transaction code, and included within the program are over 100 "include" sub-programs which are part of the larger program. These "include" sub programs are already pre-written to interact with the other SAP modules by referencing pre-existing settings and options.



A Typical Integrated SD Module Flow with FI and MM Module Interactions

On day one (1) after install, you could create an integrated transaction flow in the SAP provided "template" company that is set up for customers to use as a reference:

1. Create a new customer (XD01 – SD or FI depending on the business organization)
2. Create a new Material (MM01 - MM)
3. Create a customer specific price (VK11 - SD)
4. Load miscellaneous inventory (MB1C - MM)
5. Create a sales order (VA01 - SD)
6. Create a delivery document with reference to the sales order (VL01N - SD)
7. Create a Customer Invoice (VF01 - SD)

For these steps there would be a material document [16] created in the Materials Management module (MM-Inventory Management) with accounting documents automatically created in the Finance module (FI), to show the reduction of inventory sent to the customer. There would also be another set of accounting documents created in the Finance module (FI). These "documents" are automatically attached to the customer invoice to show any cost of sales and expected customer receivable.

Various FI module transactions are automatically populated with the customer-specific financial details, through the pre-written programs. [17] This automated data processing is accessed through other Accounts Receivable transactions. This type of pre-written software module integration exists throughout the system.

The SAP installation process makes the software available for use and the SAP implementation [18] processes determines how the software will be used.

What does SAP ERP Software do?

SAP ERP software integrates and optimizes processes across business functional areas and geographies.

In the past business functions existed "in a silo" meaning that accounting programs were built for accounting, purchasing programs for purchasing, inventory programs for inventory, etc. Each of these generally had their own custom coded programs, systems, and requirements. Often international processing required even more custom programs. With SAP ERP software all of these separate programs are replaced by a single integrated

[16] The term "document" in SAP often refers to the display of an electronic data record.

[17] If a customer wanted to "string modules together," differently than the integration with other modules already provided, custom programming would be required.

[18] The implementation process is discussed in more detail below.

application which runs on a single database and has a continuous process flow within the same application. The following is an example.

A very standard order to cash process (SD and FI module overview) in SAP.

When you create a sales order, delivery related order data is passed into the delivery document to the customer (it does not have to be re-entered). As the delivery document is processed by shipping, available stocks or inventory amounts are reduced and accounting documents are automatically generated in the background to recognize a reduction in inventory. Afterward, a customer invoice is generated from the delivery document (without re-entering the original order data), and additional accounting documents are generated related to the customer invoice. Once the customer payment is received, offsetting or clearing accounting documents are generated as the cash is posted to the customer account. Open customer receivables are reduced and the order process for this one simple example is complete. Accounting entries, inventory reductions, and other integrated processing activities occur in the background.

Inventory and Material Requirements Planning (MM, PP, and FI modules) during the Order Process.

As necessary, throughout the order process when inventory is reduced to a certain level then MRP (Material Requirements Planning) programs run to plan for the replenishment of materials and MRP II (Manufacturing Resource Planning) is carried out to ensure that there is capacity in the manufacturing facility to replenish stocks. These replenishment and scheduling activities depend on the options you choose for how they behave and how the "master data" [19] is set up to process those system settings. When MRP programs run, depending on the system settings, production orders or purchasing documents are created to replenish or produce stocks. Each of these processes has its own details and all of the associated accounting entries related to the procurement or production of stocks and materials are automatically carried out in an integrated fashion.

[19] Master data is fairly static (but changeable if necessary) data. In this example stock replenishment "trigger points" are needed. You might wish to re-order additional material from a vendor when your current on hand stock levels reach 20 units or less.

ISSUE ONE

When SAP licenses ERP software to customers, are services from SAP necessary "to complete the sale" (i.e., license)?

Software and Service Sales Lifecycle

The SAP marketplace is filled with companies who offer competing services and alternatives to SAP. In some cases customers have the requisite, in house, skills and talent to perform both installation and implementation services. SAP as a company has a very small portion of the service delivery market for their products and once the license contracting process is completed there are no other services required from SAP to complete the sale.

Enterprise Software Industry Sales Practices

Companies generally follow a consistent process when licensing ERP software.

Awareness of a Need is the Beginning of the Process

Common motivations for licensing pre-written enterprise software relate to replacing custom developed systems or aging technology. In many of these cases, there is a desire to reduce overall maintenance and development costs as well as move to newer, next generation technologies. An enterprise application, like SAP's ERP (Enterprise Resource Planning), is a next generation technology often chosen to streamline, centralize, and reduce the number of applications in use.

Beginning the Pre-Sales Process

Whether determining which prewritten software application to license, or which vendor (often called a "system integrator") will help with the transition, the process is the same. Because the sales decision process is similar for the software sale or service provisions, I will refer to the software vendor and the system integrator both as a "Solution Provider" when the steps apply to either.

There are several enterprise software vendors in the marketplace such as SAP, Oracle, Microsoft, Lawson, Salesforce, etc. Once the need is determined, a software evaluation is conducted which is separate from a system integrator evaluation.

The Selection Team

Key stakeholders are chosen who would be most affected by the new software, or those who have a strong interest. These individuals form an initial selection team. They do analysis of the Solution Providers to determine the best software or vendor services to use.

The Sales Process

After the initial data gathering activities an RFI (Request for Information) is sent out to the Solution Provider(s) to answer initial filtering questions.

Based on the responses a list of qualified Solution Providers is generated and then an RFP (Request for Proposal) is sent to each of them. The RFP will generally include more details around the requirements the customer is seeking.

After the RFP submissions, a "short list" of usually three (3) but generally not more than five (5) Solution Providers is selected. This short list is used to make the final decision after detailed evaluations are conducted.

The Software Vendor Selection (Software Selection)

In the case of prewritten software, the vendors of that software usually perform a demonstration of software capabilities and functionality. Most companies will provide some details around processes and capabilities they want to see, along with some sample data and expected results. These are "demonstration scripts" of key software capabilities.

After the customer selects the software provider, the customers enter into a license agreement with specified terms, then the customer is provided with access to their software or with installation media.

The software sale is now complete.

The System Integrator Selection (Service Delivery)

After the software selection, many companies consider purchasing installation and implementation services separately. SAP offers these services but they are not a condition of licensing the SAP software. SAP may be chosen for both system setup and project related services (installation and implementation), but more often than not, the software buyer chooses a different service provider for their project activities. It is common to have different service providers perform the installation, implementation, and even support services--, so common in fact, that SAP is not in the top ten (10) service providers for their own software. [20]

In relation to installing the software to make it available for use, many customers have the skills to perform these activities and will occasionally perform the installation processes themselves. As for the implementation services (determining *how* the software will be used after it is installed), there are some customers who perform their own

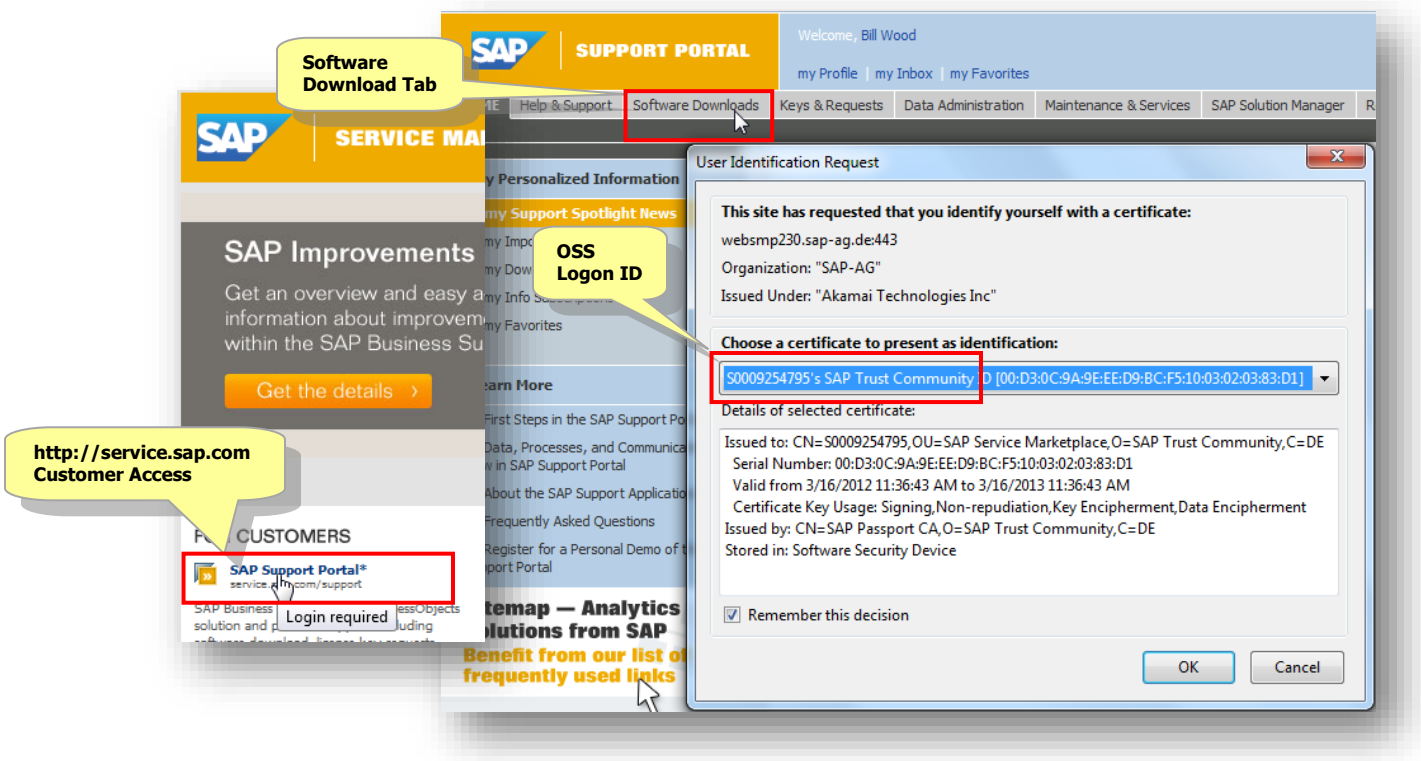
[20] Many other companies provide installation and implementation services and SAP's service delivery for its own software accounts for only a small share of the market. A recent Gartner research note reviewed the Top 10 software service delivery firms *globally* and SAP did not make the Top 10. For 2008-2009 Deloitte claimed the largest global market share at 6.2%, IBM came in second at 5.6% and Accenture was fourth with 3.7%. The last firm in the Top 10, CapGemini had 1.8%. For *North America* SAP's software competitor Oracle was ninth with 1.9% of the market. SAP did not make the list. *Deloitte Consulting "Market Share Analysis: Top 10 Consulting Providers' Revenue, Growth and Market Share, Worldwide and Regional, 2009* referencing *Gartner Dataquest Research Note G00200370*, Michael von Uechtritz, April 30, 2010, V2 RA3 05042011.

implementation services, and still others contract for outside help, such as through my own company.

It is common for SAP software customers not to use SAP for installation or implementation. It is a normal industry practice for the software license agreement to be separate from the professional services agreement.

Summary of the SAP Software Sales Process

After licensing contract(s) are signed, and SAP provides access to the software, *the software sales process is complete*. At this point SAP as a company has a signed contract with payment amounts and payment terms. The customer will be receiving an invoice based on those terms. As a part of the contract, they are also given a special "access ID" which is called an OSS (Online Service and Support) ID and password information where they can download the licensed software. [21]



The customer has licensed the software and begins its software maintenance schedule according to the contract terms. When SAP offers services, they are optional. Some companies choose to install the software themselves because they have the in house skills (which are not unusual) and SAP provides *installation* support guides. SAP also offers *implementation* support guides (such as the ASAP Methodology) and some customers choose to implement themselves. SAP as a service provider is a very small player within the marketplace.

[21] The "OSS" site is also called the "Service Marketplace" and can be access on the Internet through web address http://service.sap.com.

Opinion on Completion of the Sale

In response to the question:

(1) When SAP licenses ERP software to customers, are services from SAP necessary "to complete the sale" (i.e., license)?

Based on the foregoing, and upon my experience and expertise, it is my opinion that SAP's license of its software to Best Buy was complete when the license agreement and associated schedules were entered into. Best Buy did not need to purchase any services from SAP (or anyone else) to complete the license transaction.

ISSUE TWO

What does the term “installation” mean in reference to ERP software?

SAP Software Installation

One academic study related to an overall SAP implementation process defined the software installation process as:

> *Software installation:* the ERP installation phase in standard configuration with an initial set of modules in the servers of the companies (emphasis in original) (De Toni, Fomasier, Franchi, and Nonino, pg. 6). [22]

A more generic explanation of the software installation process can be found in "A Dictionary of Computing, by Valerie Illingsworth (Oxford Univ. Press):

> install
>
> 1. To take software from the distribution files, which can be floppy disks, CD-ROM, tapes, or on a remote networked computer, and place it in its permanent location from where it will be executed. The installation process is not just a straight copy as it involves unpacking compressed files, configuring the software to suit its environment, and perhaps allowing the installer to choose how much of the software to install. A typical installation program will offer choices of minimal, custom, or full installations.
>
> 2. To fit new hardware features to a computer.

The type of configuration referred to in this definition is technical in nature [23] and is required to make the software accessible. This type of "configuration" is completely separate and different from "configuration" activities carried out for an SAP implementation. For the SAP configuration that occurs during the implementation phase, there are different tools and resources discussed later. The type of "technical configuration" required for installation (as opposed to implementation) is generally automated after entering parameters into the software during the installation process.

> "The adaptation of system technical infrastructure includes, apart from the hardware setup, also the configuration of software such as operating systems, database management systems, etc. The management of operating environments

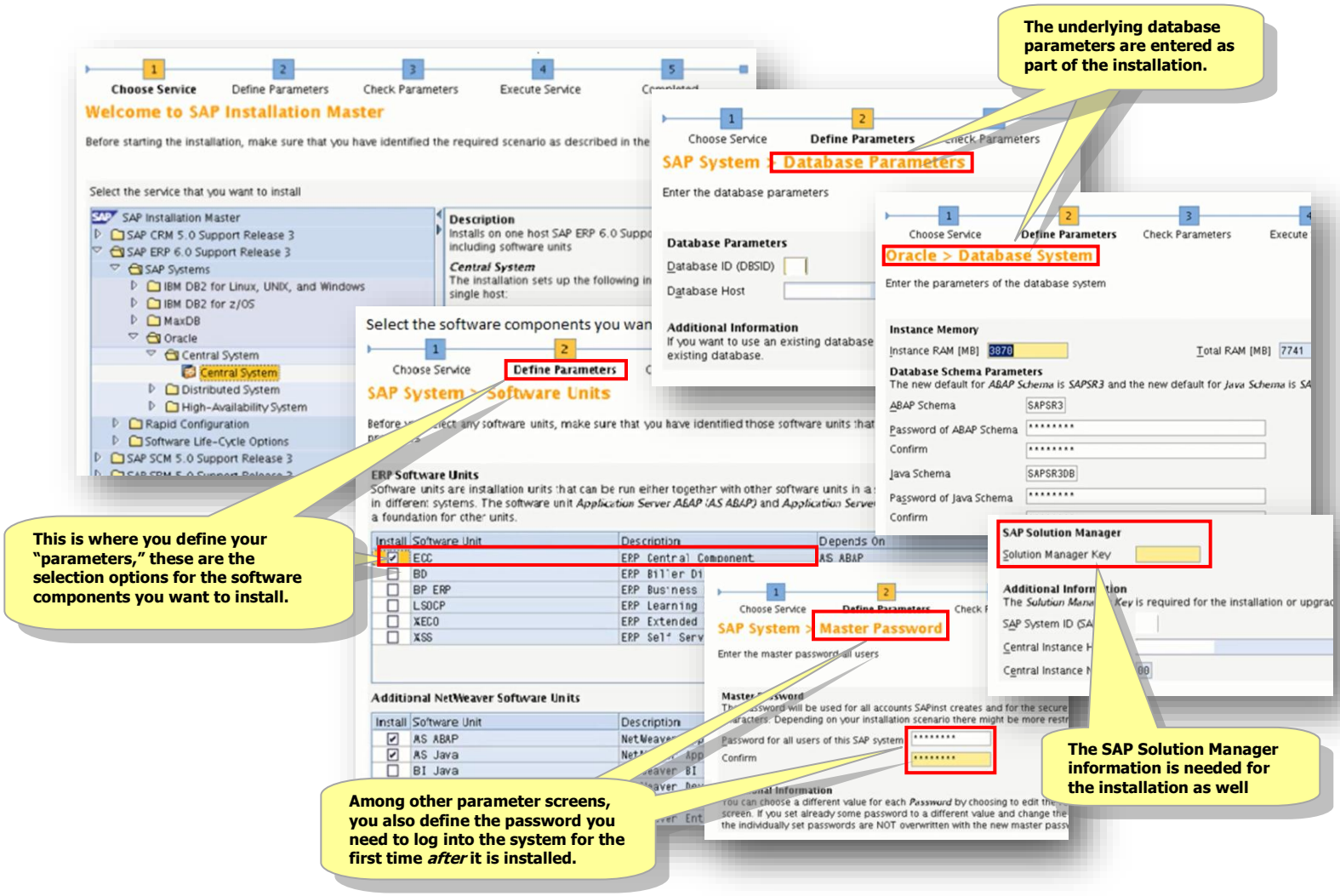
[22] De Toni A.F., Fornasier A., Franchi M. and Nonino F., (2008), "The impact of Enterprise Resource Planning implementation phases on the Task-Technology Fit", in Van der Vaart, T. Van Donk, D.P (eds.), *Tradition and innovation in operations management, Proceedings of 15th EurOMA Conference, European Operations Management Association (EurOMA),* 15-18 June 2008, University of Groningen, Groningen (Netherlands). (retrieved December 11, 2012 online at http://www.dis.uniroma1.it/~nonino/Publications/CI12.pdf).

[23] This "technical configuration" is also described on the SAP Community Network: http://scn.sap.com/docs/DOC-8967 (retrieved December 11, 2012).

involves building technical infrastructure and software installation" (Wieczorkowski and Polak, pg. 1044).[24]

SAP Software Setup

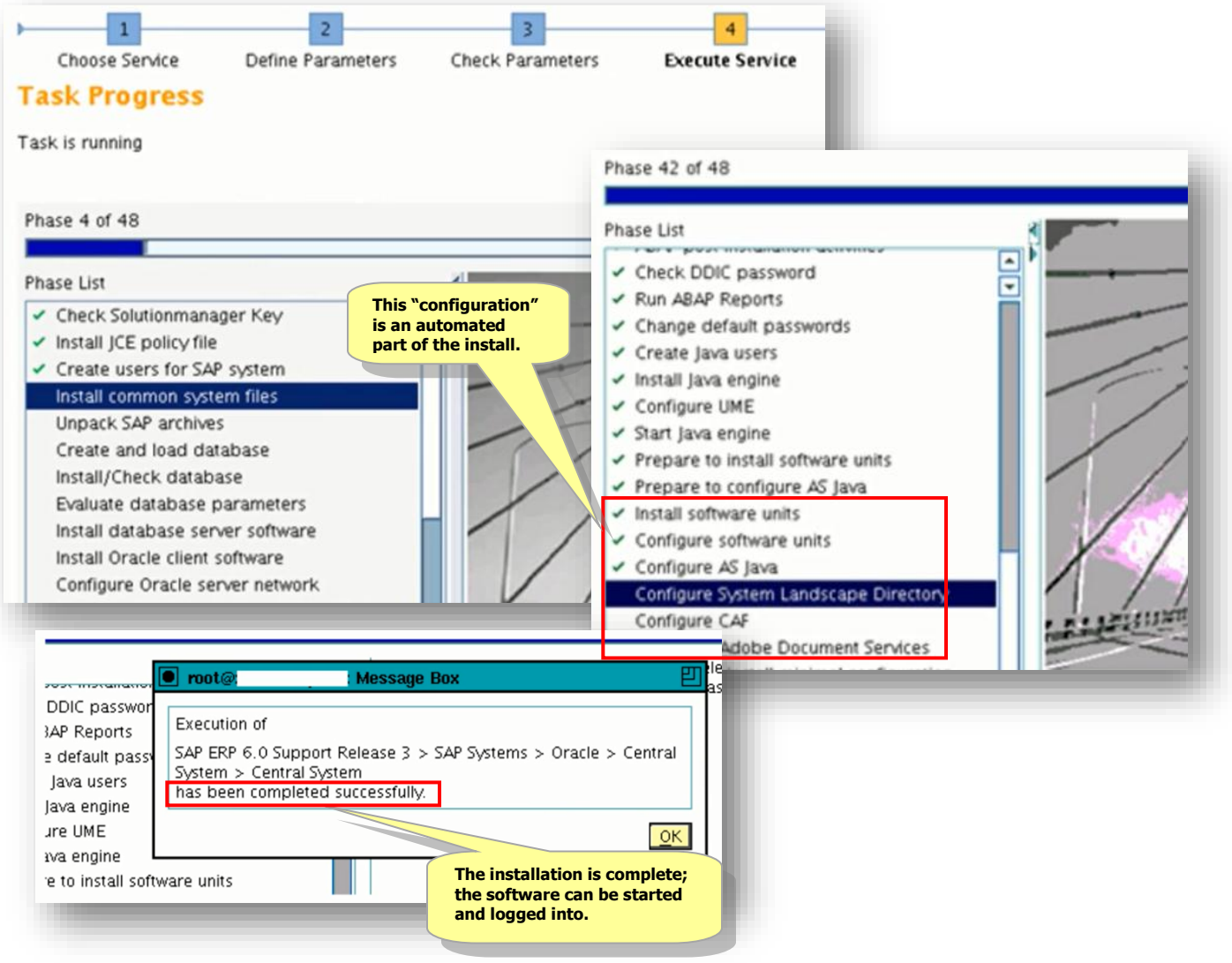
Images from an SAP ERP (ECC 6.0) installation on a Linux operating system and using an Oracle database:



As part of the installation process for SAP software you set it up on an operating system (in this illustration it is Linux), enter parameters for the software components and options you desire activated, enter connection information for the database (here it is Oracle), enter the parameters for the SAP Solution Manager system, and assign a master password. This is all required as part of the SAP software installation.

[24] Wieczorkowski, J., and Polak, P. "Analysis and Implementation Phases in the Two-Segmental Model of Information Systems Lifecycle. ISBN 978-83-60810-51-4 "*Proceedings of the Federated Conference on Computer Science and Information Systems*, pp. 1041–1046. (2012).

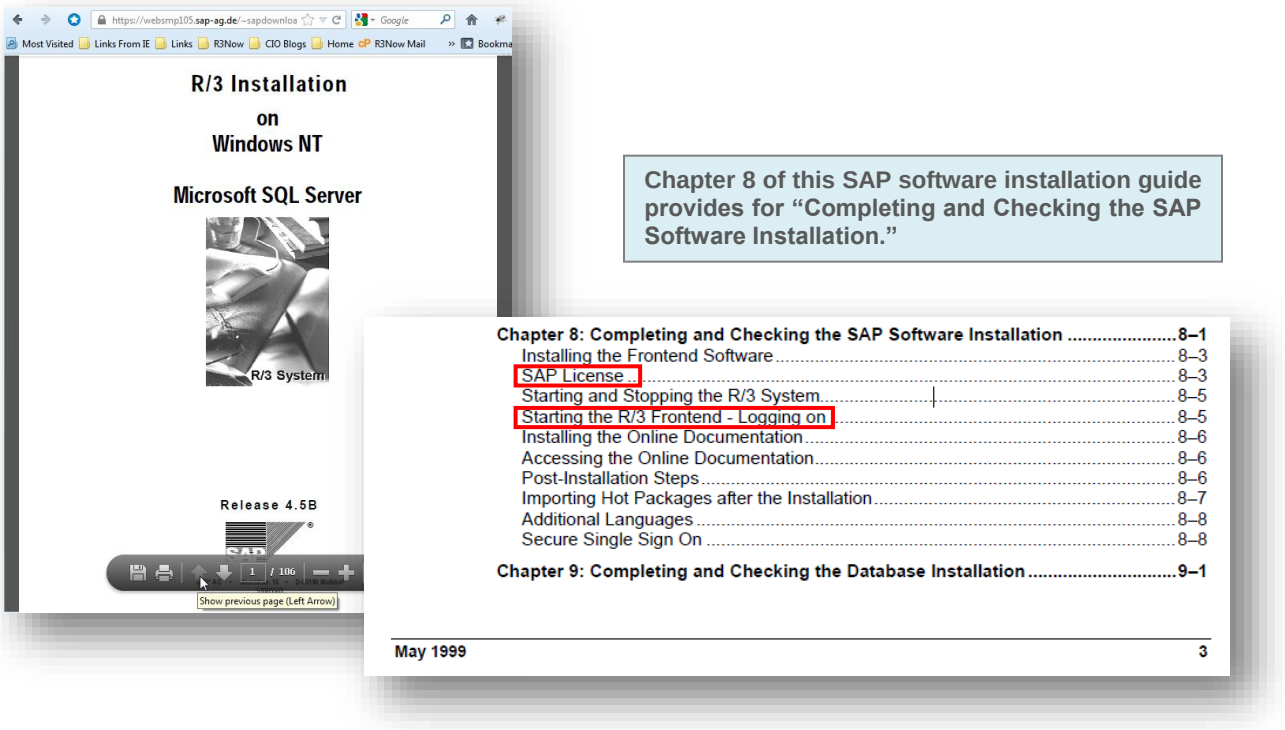
As the installation progresses toward completion, several automated steps are performed based on the parameters already entered. Some of these steps include an automatic "install" of various software components selected earlier and automated "configuration" of the technical portion of the system to complete the setup.



SAP Installation Guides

SAP has provided "installation guides" and various other installation resources since at least 1999. The widely accepted industry standard of a completed "installation" goes back many years. The widely accepted industry understanding of SAP software installation is seen by running a search query on the SAP Community Network site.[25]

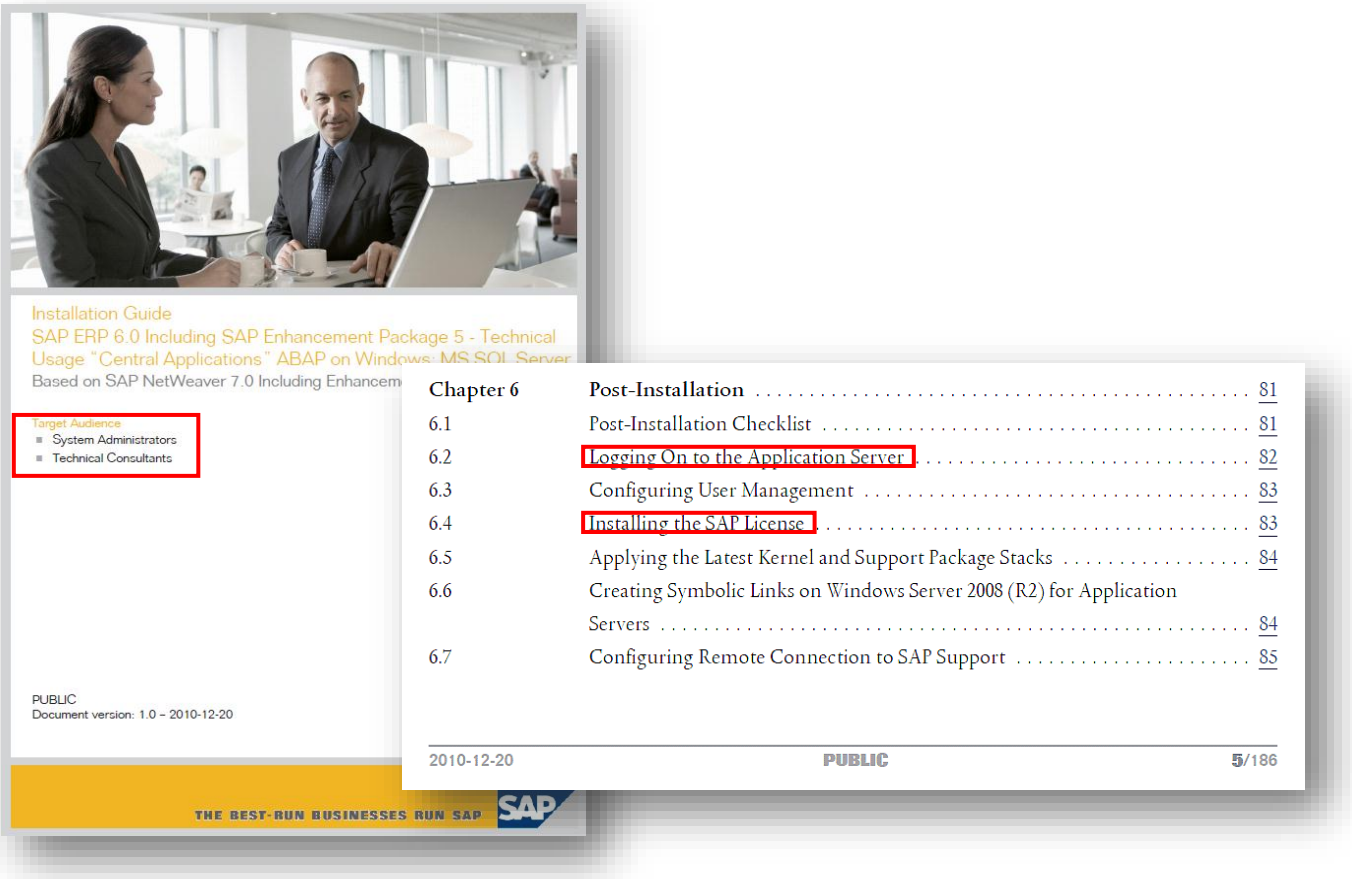
This illustration is one example of a 106 page SAP ERP (R3 Version 4.5b) installation guide for SAP which had its ***final*** revision in May 1999 (the Copyright is from 1998). [26]



[25] The following SAP search query returned over 500,000 results as of December 12, 2012. Some of these are seeking help on performing installation tasks, others describe the process, and still others provide additional online documentation and information. Those results related to installing SAP software are consistent with this report. http://search.sap.com/ui/#query=sap+installation&startindex=1

[26] This is available in the SAP Software "Installation and Upgrade" section. It requires an "OSS" ID (given to customers, partners, and SAP employees) to access the material. http://service.sap.com/~sapdownload/011000358700000952921999E/R3NTSQL.PDF (retrieved November 30, 2012)

The illustration below shows a current version of the SAP ERP (version 6.0+) installation guide (for "Enhancement Pack 5" [27]) with similar requirements. [28] As the illustration shows, it has been commonly understood that logging into the SAP system and entering a license key are both "Post Installation" activities indicating the installation is complete.



SAP had an available Installation Guide for the Best Buy software setup in 2007.[29] The front cover of that Installation Guide clearly identifies the "Target Audience" as "System Administrators" or "Technical Consultants" (just as the current guide pictured above does). The 2007 SAP Installation Guide also identifies "Logging On to the SAP System" (5.2) and "Installing the SAP License" (5.4) as "Post-Installation" activities (See attached Exhibit 1, pages 1-13).

[27] SAP now offers the "switch framework" with additional enhancement options in "Enhancement Packs." The Enhancement Pack ("EhP") version as of December 3, 2012 is version 6. However, the current installation guide for 6.0 EhP6, finalized November 8, 2011, is very short and contains a collection of links to other resources for performing the installation.

[28] SAP ERP 6.0 Installation Guide for Enhancement Pack ("EhP") 5, page 5 (Table of Contents), December 2010. "Post-Installation" items denoted as 6.2 and 6.4 call for logging onto the system and installing the SAP license.

[29] SAP ERP 2005 SR2 - ABAP+Java on Windows: MS SQL Server, Doc. version 1.10 (April 2007).

SAP Installation Landscape

Current SAP ERP installation requirements use four (4) pieces of software; they are the SAP Solution Manager, SAP Netweaver, an operating system, and a database product.

SAP Solution Manager

Solution Manager is an SAP management software application that is used to manage the SAP (and non-SAP) software landscape. While it is much more than just a software management platform, [30] it is required to manage SAP software applications. Most companies use SAP Solution Manager only for technical reasons such as adding patches (i.e. program fixes) to their SAP software.

SAP Netweaver

The modern SAP application also includes the "Netweaver Platform" as its program foundation. The Netweaver foundation is an "interpretation engine" for software languages; in some ways, it is like interpreting English to Spanish but in the form of different software languages. The Netweaver platform is the programming development environment that can process SAP's proprietary programming language of ABAP into other languages such as Java.

Installation Requirements

Nearly all modern SAP software programs use both Solution Manager for management and Netweaver as the foundation to run the SAP applications. On top of all of this, there are two (2) other layers--, the database and the operating system. [31]

SAP applications are generally database and operating system agnostic. What that means is the SAP software programs run on most of the mainstream "enterprise" level database applications and operating systems.

[30] See e.g. the white paper written by Bill Wood and Courtney Bjorlin for Searchsap.com and sponsored by Cisco Systems, Inc. at http://www.r3now.com/download/CiscoSolMan.pdf

[31] See generally the section entitled "SAP System Architecture" pg. 55-57, Schneider-Neureither, A. *SAP System Landscape Optimization*. SAP Press, 2004. ("The application logic of MySAP components can run on numerous operating systems and platforms" pg. 57).

Completing the Installation

The install guide chosen for illustration and reference are for Microsoft SQL Server, however, the installation guides for other databases or operating systems are consistent.

To reach a point where a user (even the system administrator user) can log into a system and then enter the SAP license key requires the completed setup of several dependent items.

- An Operating System
- A Database
- SAP Solution Manager
- SAP Application (with the Netweaver "translation stack")

You cannot log into the SAP application and enter the license key without reaching the point where the entire "environment" is set up. At this point, all of the initial setup parameters in the operating system, database, Solution Manager, and the SAP application have been entered sufficiently to start and begin working with the software.

While additional adjustments or changes may be made to any one of these items (usually for performance reasons), those parameter adjustments may continue for several years as the system and the organization continue to evolve. For example, maintenance and adjustments are needed if the database was originally "sized" too small. If the operating system runs low on memory, then additional memory may be added. That and other types of settings tend to be "normal operations" *after* the system is installed.

Who Performs SAP Installation Efforts?

SAP project typically consist of a few key roles. Some of those roles include:

- Project management
- Basis consultants
- Functional consultants
- Technical consultants
- Change and training consultants

For the early "setup" or installation portions of the SAP project a Basis consultant (or company employee) is used. These individuals tend to have skills in computer hardware, databases, networking, and operating systems (sometimes they are referred to as system administrators). [32] The job posting visual from IBM [33] for a Basis consultant shows these

[32] Before moving into SAP work, I received significant training and did consulting in computer hardware, networking, and Microsoft server operating systems. Because of working with SAP, I have continued to maintain a fair level of proficiency with databases, operating systems, networks, and infrastructure. Within my own home, I

key skills for Basis (installation) consultants. Functional consultants or "implementation" consultants (as will be explained later) focus on SAP software settings and business process requirements, generally after the software is installed, for customer specific process requirements.

SAP Basis Consultant

Job description

At IBM we know technology. But technology is only as good as the results it delivers. Are you interested and adept in application development methodology and tools?

As an Application Consultant at IBM, you'll team with some of the best minds in the industry to create innovative high quality solutions focused on clients' business needs. You'll do this using your systems knowledge and expertise to design and model applications, develop application solutions, and integrate them with packaged applications.
IBM is searching for SAP Basis Administrators with 2-3 years SAP Basis administration.

- Experience with installation of ECC 6.0 Java Portal XI/PI DMS BI/BW Business Objects.
- Experience with system monitoring application of software patches and OSS Notes.
- Experience with data base monitoring.

Skills Required:
- Problem determination and troubleshooting
- System performance and tuning
- Systems administration and operations
- Perform installation, upgrades, system copies and configuration of Netweaver application and components
- Knowledge of backup and recovery scenarios
- Knowledge of technical infrastructure and networking
- Applying SAP maintenance for ABAP and Java applications

Specific operating systems skills not required but experience in a variety of OS and database environments would be a plus (UNIX, Windows, etc. / Oracle, DB2 etc.).

Job Information

→ Company: IBM Corporation
→ Location: Washington/Metro, DC 20059
→ Job Status/Type: Full Time, Employee
→ Job Category: Sales/Retail/Business Development
→ Occupations: General/Other: Sales/ Business Development
→ Industry: Computer/IT Services

> SAP has two sides to its software, the application or the functional side of the software and basis or the technical side. The functional side deals with the applications such as human resources, personnel planning, materials management, investment management and so on. The technical side is mainly concerned with operating system, database, SAP kernel and middleware tools. The group of people that works on the functional side [are] known as functional analysts and those on the technical side are known as 'basis' or technical analysts (Nair, pg. 1).[34]

For SAP software installation efforts, Basis consultants (or equivalent company employees) [35] perform the SAP software installation functions.

It is common for third party installers to perform the SAP software installation. In the projects I have participated on SAP is rarely used to do the software installation, primarily because of their premium consulting rates.

Installation Requirements Summary

SAP ERP software product installation requires Solution Manager and SAP Netweaver. SAP installation guides support the conclusion that the ability to log in or to enter a license key demonstrates installation has completed. For example the 2007 Installation

---

maintain a relatively complex network as well. However, I consider SAP functional consulting my primary area of expertise.

[33] This image was captured from the online job site "Monster.com," a link is not provided because job posting boards tend to clear these postings relatively quickly.

[34] Nair, A. "SAP Change Management." (2009) (a California State University in Chico Thesis and Project Proposal), referencing Hernandez, J., *SAP R/3 Handbook*. New York, NY: McGraw-Hill Professional, 2005. Online at http://csuchico-dspace.calstate.edu/xmlui/bitstream/handle/10211.4/148/4%2022%2009%20Arvind%20Nair.pdf (retrieved December 8, 2012). See also page 15 of the project proposal for more detailed information on SAP Basis.

[35] Many SAP customers have the requisite technical skills in their employees to do the SAP software installation. Even some smaller companies have these skills.

Guide identifies logging onto the system and installing the license key as "post-installation" activities (See Exhibit 1, pg. 10).

The ability to log in or enter a license key means that whatever database or operating system has been chosen has also been set up. Further, it also means that the SAP foundational components of Solution Manager and Netweaver are set up and operating. If *any one* of these elements were missing then a user (even the user setting up the system) would not be able to log in or enter the SAP license key information.

For those SAP software applications that SAP as a company resells, or might use a different license key or activation requirement, the test of whether a user can log into the software application is sufficiently reliable to demonstrate that the application has been installed.

Opinion on SAP Software Installation

In response to the question:

(2) What does the term "installation" mean in reference to ERP software?

It is accepted throughout the software industry that installation is complete when software is accessible, meaning that a user can launch the program and, where a log in is required (as with SAP), the user can log in. This would be true of the widest used software applications in the world such as Microsoft Windows, Linux, or Microsoft Office. Using the ability to log in demonstrates access to the installed software (when logging on is required).

SAP software installation has a widely accepted industry standard and definition. The determination of the completion of SAP software installation can be made with a great degree of consistency and reliability--, the installation is complete when a user can log into the system or after the license information is entered.[36, 37] This is consistent throughout the software industry where logging on or license information is required.

As it relates to the SAP software products, the ability to log into the SAP software indicates that all of the other pieces of software, which SAP must use to operate (database, operating system, and SAP Solution Manager System), are also installed and

[36] SAP Install guides reference logging in and entering the SAP license under various chapter headings with names such as "Completing and Checking…" (version 4.5b – *circa* 1999) or "Post-Installation" (version 6.0 Enhancement Pack 5 – *circa* 2010). These are post-installation activities demonstrating the installation is complete.

[37] Other guides were reviewed which demonstrated a consistent approach over time. See *e.g.* SAP ERP 2005 SR2 - ABAP+Java on Windows: MS SQL Server, Doc. version 1.10 (April 2007); SAP R/3 Installation on Windows 2000: MS SQL Server, page 142, Chapter 11: Post Installation Activities for MSCS (April 2001). A checklist table is provided where step two, and step three, call for logging onto the system and entering the license key.

operational. A user cannot log into the SAP application until all of the components for using the system, and the software system itself are installed.

Based on the foregoing, and upon my experience and expertise, it is my opinion that the installation of SAP software involves placing it on computer hardware from which it will be executed. The software is fully installed when any user can log into the SAP program.

ISSUE THREE

What does the term “implementation” mean in reference to ERP software?

SAP Implementation

The installation process makes the software available for use. *The implementation process determines how the software will be used after it is installed*.

The SAP implementation process involves numerous customer requirement meetings, discussions, and reviews of business processes and business requirements with various stakeholders. These customer requirement meetings lead to documented process flows, custom programming development requirements, and overall planning for the transition to the new software processing (i.e. the "Blueprint"). From these requirements and documentation, the parameters are entered which support the customer required process flows, data conversion from old systems to new SAP software is developed, training is prepared, and the business is made ready for the changes (i.e. "Realization" and configuration). As configuration is completed, the SAP software is ready for the conversion of old data to the new formats, and users are being trained as the software is prepared for transactional processing (i.e. "Final Preparation"). After this, a new transactional processing environment has data loaded and more users [38] begin using the SAP software system (i.e. "Go-Live").

The academic literature defines what an ERP implementation is as follows:

> "[A]n ERP implementation could be considered a mechanism for achieving organizational integration across departments…" (Santamaría-Sánchez, Núñez-Nickel, and Gago-Rodríguez, pg. 87). [39] "ERP implementation is an organisation wide issue and can be viewed as an innovation project, strategic change, an organisational system, software, business process improvement technique, or an IT integration of the firm" (reference omitted) (Al-Fawaz, Eldabi, and Naseer, pg. 3). "[ERP] implementation involves changes in many components of an organisation such as business processes, planning, stakeholders (such as users, customers, top management) while posing risks in terms of managing the human capital, firm's other resources (such as finance, technology, brand image and operations)" (reference omitted) (Al-Fawaz, Eldabi, and Naseer, pg. 4).[40]

When a company decides to use outside consulting services, the individuals who perform implementation services are called "functional consultants." Their skills are very different from the installation or "Basis consultants."

---

[38] Throughout the implementation process numerous company employees and possibly consulting service providers have been using the SAP software.

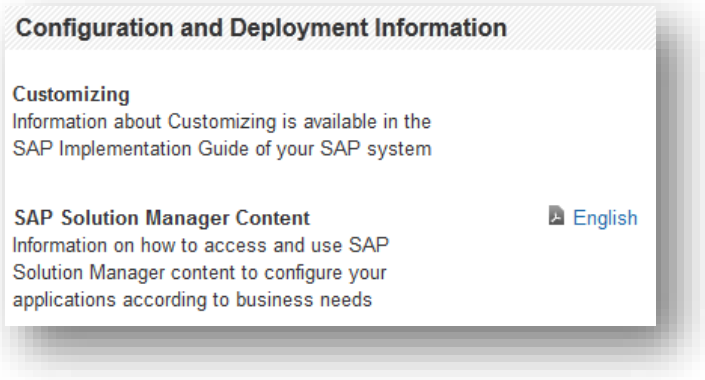
[39] Santamaría-Sánchez, L., Núñez-Nickel, M., and Gago-Rodríguez, S. "The role played by interdependences in ERP implementations: An empirical analysis of critical factors that minimize elapsed time." *Information & management* 47, no. 2 (2010): 87-95.

[40] Al-Fawaz, K., Eldabi, T., and Naseer, A. "Challenges and influential factors in ERP adoption and implementation." (2010).

Basis consultants (or the company's own internal employees) have specialized technical skills and perform the software installation. Functional consultants perform implementation activities and have very different skills and experience than Basis consultants. A functional consultant generally has skills around configuring the software parameters in one or more SAP modules (or "functional" specialties) to ensure that all of the business or organization requirements are available. They also generally have more of what are referred to as "soft skills" or communication, leadership, facilitation, meeting management, and change management skills to help with various business change requirements.

The SAP Implementation Guide ("IMG") for Configuring SAP Software

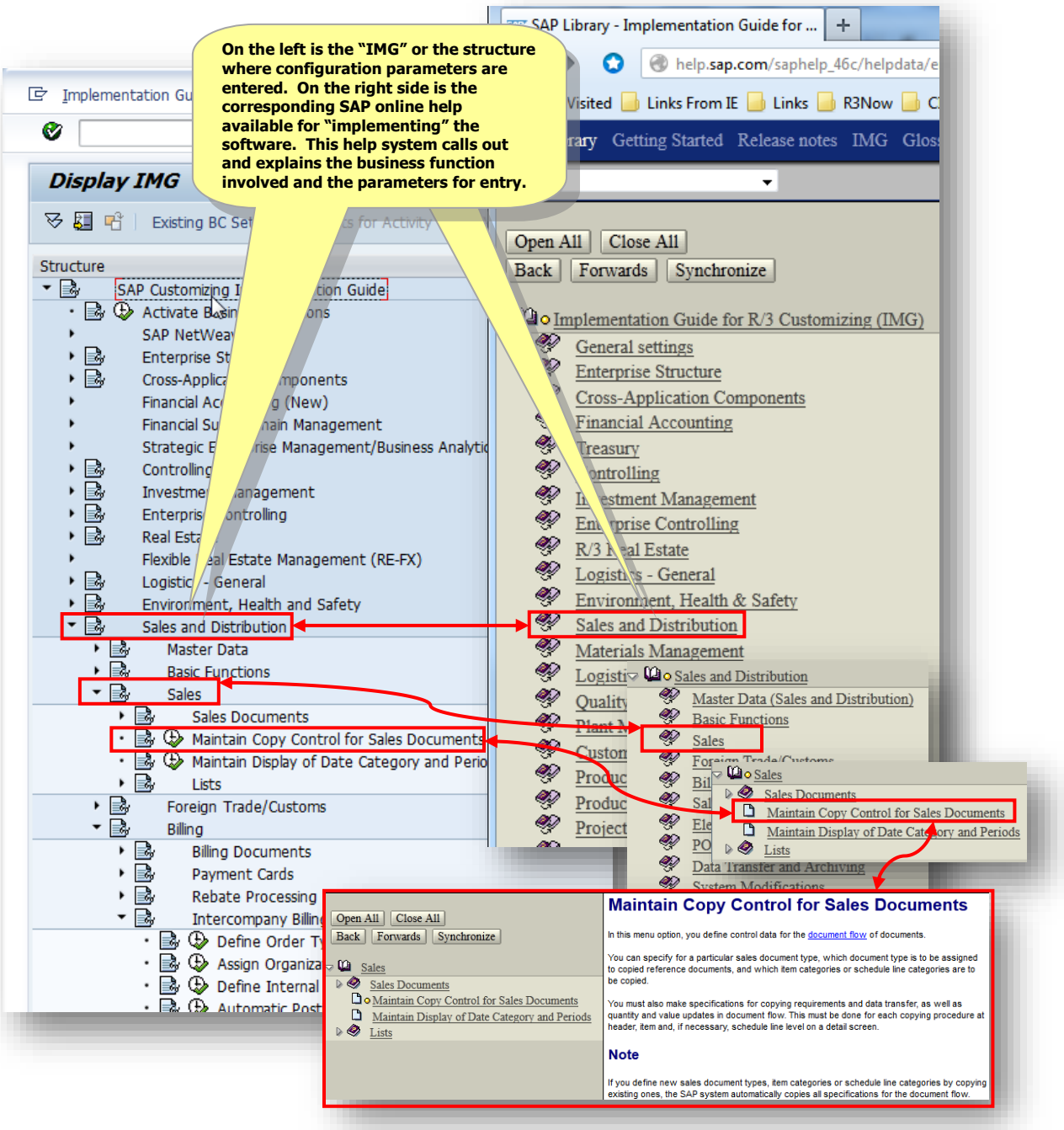
This explanation and the following illustration are for contrast and comparison purposes.



The tool for configuration of SAP software is called the "IMG," or the "Implementation Guide." This type of customization or configuration of the SAP software is performed within the software after it is installed and users are able to log into the system.

Because of the breadth and depth of business processing options, across various industries and business activities SAP provides an online system for configuration guidance. However, configuration cannot be performed until after the software is installed.

The following graphic shows the SAP system (where settings are made), alongside of the SAP provided reference library for performing these settings. This illustrates the types of business areas where consulting expertise may be applied, and a significant difference in the types of business process related skills for the configuration effort. These skills are very different from the technical hardware and software installation skills for the Basis (or system administration) type consultant. On the left side of the graphic is the IMG (Implementation Guide) from the SAP software. On the right side is the online help from a prior version of SAP because many additional tools for setting up the current version of SAP is contained in the SAP Solution Manger management system.



SAP Delivery Methods and Methodology for Implementation

ASAP Methodology is the SAP Industry Standard

The ASAP Methodology is the default industry standard for SAP implementation. SAP originally released it in 1996 and has updated, revised, enhanced, and continued to improve it since. This implementation methodology is the approach, tasks, tools, resources, and requirements to determine *how* the software will be used after it is installed.

> The accelerated SAP (ASAP) implementation methodology is a structured implementation approach that can help managers achieve a faster implementation with quicker user acceptance, well-defined roadmaps, and efficient documentation at various stages… The key phases of the ASAP methodology, also known as the ASAP roadmap, are: project preparation, business blueprint, realization, final preparation, go live & support.
>
> The structure of each phase is the following: each phase is composed of a group of work packages. These work packages are structured in activities, and each activity is composed of a group of tasks. For each task, a definition, a set of procedures, results and roles are provided in the ASAP roadmap documentation (Esteves and Pastor, pg. 1020). [41]

Most of the system integrators (i.e. software service providers) with their own custom methodologies follow a very similar process although they may call the "phases" by different names or mix and match activities during the various phases.

The current version of the SAP ASAP Methodology has 6 Phases (although most system integrators reference the first 5). The sixth phase relates to ongoing customer support of their solution after system integrators have generally moved on. These 6 Phases are referred to as a "Roadmap" by SAP.

[41] Esteves, José, and Joan Pastor. "Analysis of critical success factors relevance along SAP implementation phases." In *Proceedings of the Seventh Americas Conference on Information Systems*, pp. 1019-1025. 2001.

ASAP Methodology Phase and Task Breakout [42]

At a high level the ASAP Methodology covers the implementation and the five most commonly used processing phases, which consist of the following:

1. **Project Preparation**

   This is the initial planning and preparation phase of the project. Project goals, scope, and objectives begin to settle and team members are on-boarded and trained. Refine a schedule, budget plan, major milestones, and deliverables.

   - Clarify scope
   - First pass at a Word Breakdown Structure ("WBS") and task based project plan
   - Project organization, committees, and resources
   - Project standards
   - Knowledge transfer approach is determined
   - First pass at master data design (existing system extract requirements)
   - Interface strategy
   - Testing strategy
   - Hardware requirements

1. **Project Preparation** - The project is formally initiated, and planning is well under way.
2. **Business Blueprint** - The project team gathers requirements and conducts the conceptual design of the solution.
3. **Realization** - The solution is built and the integration tested; performance tests are planned.
4. **Final Preparation** - End users are trained; this is the final check before the cutover to the new system solution.
5. **Go Live and Support**- The solution receives confirmation, ongoing support is in place, and the project is closing.
6. **RunSAP** - The operability of the solution is ensured.

2. **Business Blueprint**

   Align current business models and processes ("As-Is") to future, SAP centric, business processes and models ("To-Be"). Develop the overall solution design, including any additional software needs or custom programming requirements, and at least by the end of the blueprint have the first development system installed to begin setting up the To-Be business model. Customer requirements around automation of their data processing within business steps is captured and documented in process flows. Key ideas and concepts required by the customer are captured and turned into the To-Be process flows; they have development requests generated (see the RICEF(W) list below); or additional pre-written software requirements determined.

   - Schedule meetings with key business stakeholders

[42] Adapted from the SAP ASAP Methodology Presentation contained within ASAP version 7.2 in the PowerPoint presentation called "ASAP Roadmap Phases Descriptions.ppt" ASAP version 7.2 is the latest version as of December 7, 2012.

- White-board current processes ("As-Is") and define the future processes ("To-Be")
- Produce flowcharts which document the processes (a business process hierarchy and design)
- Determine where there are gaps between the pre-written software and the business processes which must be custom programmed or find alternatives
- Develop a list of RICEF(and sometimes W) requirements [43]
  - **R**eports
  - **I**nterfaces
  - **C**onversions
  - **E**nhancements
  - **F**orms
  - **W**orkflow

- Make an initial assessment of organizational and business process changes
- Revise and refine the project plan
  - Refine scope, resources, and schedule
  - Confirm the implementation completion date
  - Gain approval of project templates and deliverables
- Ensure there is a Development system installed to begin the next phase.

3. **Realization**

Build and test the complete To-Be business and system environment. Begin change management processes while developing training materials and any customer specific user help information. This is the execution of the system design effort created in the blueprint phase. It includes the converting of existing (i.e. "legacy") system data into the new SAP To-Be design. This is often done at a first pass by the "functional" consultants, through configuration efforts, and then the testing and development of the transformation requirements for the data.

- Build the solution by:
  - Entering the parameters to the customer-specific requirements (i.e. "configuration")
  - Perform custom programming if necessary to enhance or modify the pre-written software (i.e. RICEF(W))
- Test / adjust / correct the solution
  - Test plans and requirements
  - Unit testing (ensure individual transaction codes work correctly)

[43] RICEF(W) requirements will be discussed in more detail later. The RICEF (and sometimes W) concept is widely known and accepted throughout the SAP implementation space however there are times the acronym has the letters rearranged. For example, some refer to this as FRICE but it is the same concept and same key acronym items.

- Process testing (ensure the transactions within a module work together correctly)
- Integration testing (verify the software behaves as expected across multiple modules and across any connected systems)

- Conduct data extract, transform, and load trials
- Complete and test the RICEF(W) customer requirements
- Develop end-user training (courses, logistics, schedules, etc.)
- The QA and production systems are installed and configuration from the development system is applied by moving it into those systems.

4. **Final Preparation**

Prepare for production operations. Ensure users have security access while final preparations for data loads are made. Validate the entire production environment by performing a Go-Live "rehearsal."

- Perform user acceptance testing (this is to make sure the customer requirements are met) [44]
- Develop a cutover plan (this is an "activity script" to ensure all steps for moving from old systems to new are in place)
  - Perform final data conversion rehearsals (mock conversions with live data)
  - Test the final cutover with a scripted process
- Resolve any open issues or gaps
- Perform final setup activities related to printing, interfaces, external systems, third party software, etc.
- Conduct end-user training
- Prepare help desk for operations

5. **Go-Live**

Make the transition to the new production environment and the new To-Be business models and processes. Monitor and support the new system for a transition period. Implement the long-term support environment.

- Transition the enterprise to the new SAP system
- Support the live environment with any needed fixes or enhancements
- Optimize system performance
- Transition to site support (help desk, etc.)
- Close the project

[44] This step is performed generally at the end of Realization Phase 3 or the beginning of Final Preparation Phase 4.

Again, this is a simplified overview of the various phases of an SAP project. It is not uncommon for project plans at some companies to have thousands of tasks and steps. The customer specific approach and method to project management generally dictates the level of detail used in this methodology even though SAP provides templates, tools, and resources to use as is, or as a guide.

For most companies undertaking an SAP project many of these processes continue after go-live. Evolving business needs in a "live" system will lead to ongoing requirements gathering processes similar to blueprinting and additional configuration tasks. The configuration of the SAP software to fit a dynamic business continues as long as the SAP software remains within that organization.

The activities performed by SAP Retail for Best Buy consisted mainly of blueprinting and configuration tasks. Because these were the primary services, a more extensive review will be offered for these functions.

What is an SAP Blueprint?

The Blueprint process generally involves many meetings and discussions to provide information on "best practices," industry knowledge, business processing knowledge, and other insights to help customers with their requirements. Through the dialog with the customer, a framework for the future business state (the "To-Be" state) is developed which includes detailed business transaction requirements. From these business transaction and processing requirements, a document called a blueprint is created. The blueprint maps various process flows in flowcharts, creates a list of development requirements, and catalogs business process change requirements, data transformation options, and many other business transactional functions.

The academic literature has much to say about SAP Blueprinting, especially as part of SAP's structured approach in the ASAP Methodology. [45] Some of the activities involve gathering business requirements where "project team members interact with respective core team members or process owners… [in addition, the] following components are discussed and documented: project management, organizational change management, training, develop system environment, organizational structure definition, business process analysis, business process definition, [and a]… quality check (Constantin, D, pg. 201).[46] In SAP, the business blueprint "is a visual model of the business' future state" which allows "the implementation project team to clearly define their scope… to run the organization [or] business."

[45] Business blueprint definition as part of the ASAP methodology and as the ASAP methodology contained in SAP's Solution Manager product) See e.g. pg. 543 and 558. Hernandez, A., Keogh, J., and Martinez, F. *The SAP R/3 Handbook*. McGraw Hill/Osborne, 2006.

[46] Constantin, D., "ERP inside Large Organizations." *Informatica Economica* 14, no. 4 (2010): 196-208.

> "The Business Blueprint is a detailed description of your business processes and system requirements… The overall goal of the analysis is to deliver a comprehensive information model. This model intends to catch the requirements… for the later data design… The Business Blueprint is used as the guide for the system configuration…" (Sharma, pg. 3) [47] "The main objective of this stage is to document the business requirements for the implementation. The SAP ERP implementation project should formulate a clear conceptual design collecting current valid business requirements (so-called "as-is"), and conforming how the SAP solution will meet these requirements (called "to-be"). In order to achieve this, discussion meetings and workshops with the key stakeholders are needed. At the end of this phase the conceptual design must be formulated in a business blueprint document" (Gracheva, pg. 11).[48]

During the business blueprint, "organizational change management and business process reengineering are more relevant" because "there is the need to understand how the organization intends to run its business within the SAP system and the changes in the organization." (Esteves and Pastor, pp. 1022-23). [49] One important component of the SAP business blueprint phase is to prepare for the coming business changes. Often this is referred to as "Business Process Reengineering," or BPR, and is reflected in the process flows and business transactions (further reflected in the SAP transaction codes) which will take place in the SAP software.

> "Business Process Reengineering (BPR) transforms organization operations to entirely new and more effective business processes. BPR is primarily cross-functional in its focus. BPR involves questioning assumptions. In the mid 1990s, especially[,] workflow management systems were considered as a significant contributor to improved process efficiency. BPR is usually utilized in the Blueprint Phase" (Wang, pg. 99). [50]

From practical experience, the SAP blueprint consists of developing and documenting a "catalog" of process flows which show how the company's business processes will be performed in the SAP software. This generally involves creating process flow diagrams

---

[47] Sharma, D., "Selection, Implementation & Support of SAP ERP System Approach In Manufacturing Industry." *Global Digital Business Review*, 4, no. 1(2010). See also, Sharma, D., Prasad, A., Kumar S., and Narpat S. "The Best Performance Practices in Project Management of SAP ERP Accomplishment." *International Journal of Information and Electronics Engineering*, 2, No. 5, September 2012, pg. 837 related to SAP Business Blueprint.

[48] Gracheva, E., "ERP Implementation: IT project management using the SAP Roadmap." *The University of Hanover School of Economics and Management. The Institute for Information Systems Research* (2010). Online at: http://www.iwi.uni-hannover.de/upload/lv/sosem10/Seminar_SS_2010/SS10/Seminararbeit/Gracheva/seminararbeit.pdf (retrieved December 7, 2012).

[49] Esteves, J., and Pastor, J., "Analysis of critical success factors relevance along SAP implementation phases." In *Proceedings of the Seventh Americas Conference on Information Systems*, pp. 1019-1025. 2001.

[50] Wang, Ming. "Integrating ERP/SAP to Information Systems 2010 Curriculum: Design and Delivery." *Information Systems Education Journal* 9, no. 5 (2011): 97-104.

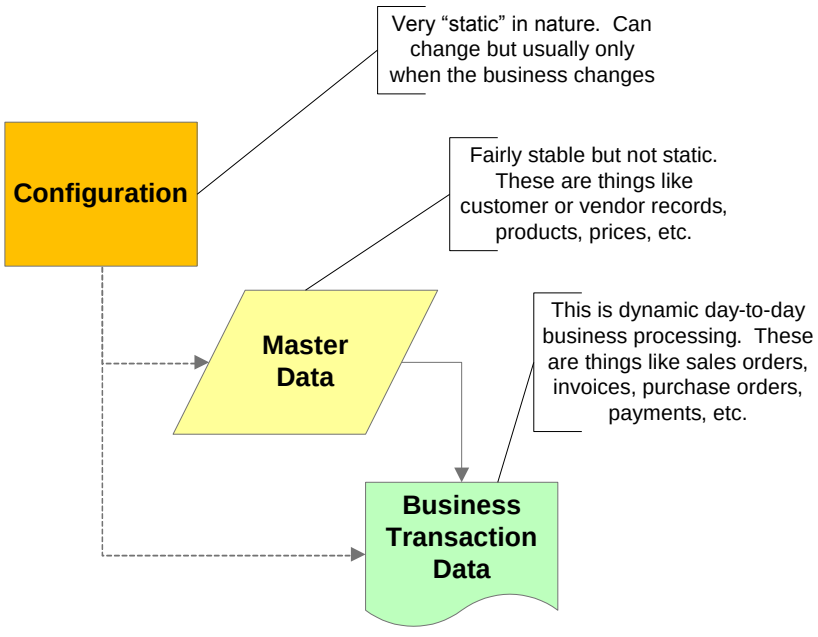
that show the inputs or triggers to the process, the process itself, and then the outputs from the process. These are created through numerous meetings and discussions with the various business stakeholders who have the knowledge of how these processes work within the company. Following these discussions a "future state" (or To-Be) business blueprint is created. This maps the SAP transactional processing to the customer specific business requirements.

What is SAP Configuration?

The consulting process for configuration provides expert guidance, support, and business process knowledge for the purpose of selecting the most appropriate software options for customer specific business requirements. Academic literature describes configuration as a process for defining business functions:

> "[Configuration] entails understanding of customization activities that match the workflow requirements of a particular business to the functions provided by R/3 Software. Business process engineering supports this matching." (Hayen, Holmes, and Cappel, pg. 80).[51]

An SAP university alliance program (University SAP training program) provides a basic configuration description indicating it "involves how to meet the requirements of a business using the standard building blocks of 'best business practices' embedded in the [Enterprise Software]. It includes: (1) defining the organization structure, (2) establishing basic settings, and (3) entering master data." (Hayen, Roger L., and James, pg. 134). [52]



For each activity within a business process (such as sales order creation), there are "configuration" options. Each of these configuration options represents pre-delivered system

[51] Hayen, R. L., Monica C. Holmes, and James J. Cappel. "A Framework for SAP R/3 Enterprise Software Instruction." *Journal of Computer Information Systems* 40, no. 2 (2000): 79-85.

[52] Hayen, Roger L., and James J. Cappel. "Certification in Enterprise Software: An SAP R/3 University Alliance Program Experiment." *Issues in Information Systems* 2, no. 1 (2001): 132-138.

setting options (or parameters) to influence how the process step behaves. You might have a special order type that automatically creates a "delivery" when it is saved. You might have another order type that is blocked as soon as it is created so that it can be reviewed before further processing. There are also configuration options for master data. Master data tends to be information that is very stable and does not change often, for example it might be a customer's payment terms, or whether they will accept partial deliveries (or complete deliveries only), etc. These master data options also influence how data is processed in the system at a day-to-day transaction level.

Both the configuration and master data determine a finer level of transactional actions within each step and specific to each piece of master data. As an example you might maintain separate configuration, which controls the type of master data requirements for each customer, each vendor, each material or service, etc. Some examples of this type of configuration around defining customers might involve:

- Determining what types of customers a company does business with (*e.g.* wholesale, retailer, distributor, commercial, private, joint venture, inter-company, etc.)
- The type of credit options that are available to a certain types of customers (*e.g.* risk limits or types, payment terms [net 30, 60, etc.], order blocking options based on credit exposure and customer type, etc.)
- What types of dunning arrangements should be processed by customer type
- Options and types for pricing that is available to customers

This is a short example. For customer processing alone, there are hundreds of possible settings, which in turn influence hundreds of data processing options. This does not include all of the integration that is already defined for material processing for that customer. Across all of the pre-written SAP modules, there are thousands of individual configuration settings, which then influence or affect thousands of automatic data processing options, with the integration rules already programmed. These are pre-written software options to address the various ways a company might interact with its customers throughout all of the customer related business processes.

If a supplier is not able to fulfill part of an order, an alternate supplier might automatically be chosen based on certain rules, or depending on the capacity of a manufacturing facility some of the subassembly processing might be moved from Italy to France. Each of these steps can be reported on, evaluated for efficiency, or globally consolidated in such a way as to help with vendor price negotiations.

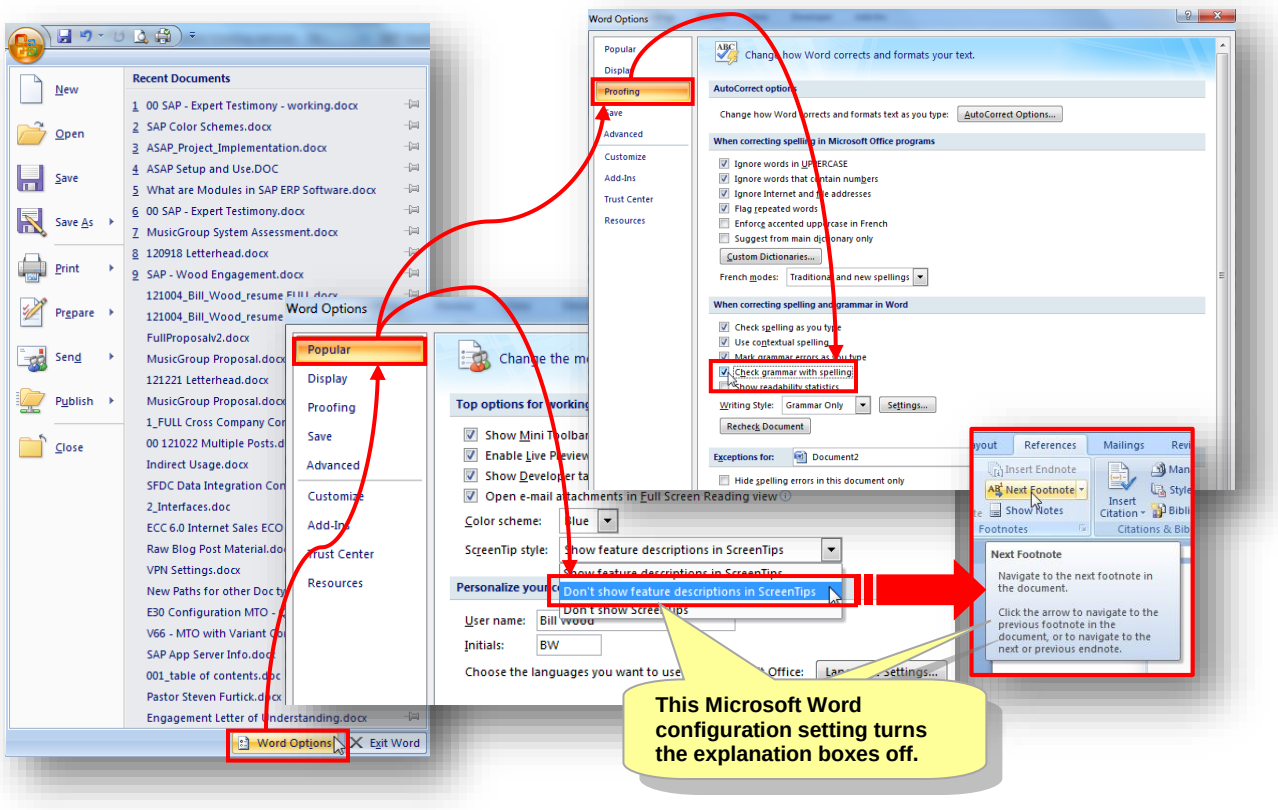
To accommodate customer specific requirements, and to ensure customer specific options are available, different combinations of pre-existing parameters allow for customer-specific settings. These settings use existing programs and rely on existing parameters to choose how the software programs behave.

An important consideration for configuration activities is that they do not stop. If a service provider is used, at the end of their consulting engagement and a live system, configuration continues. This is most often performed by the customer after the system is live.

If the SAP pre-written software application is still not able to handle a very specific business or country requirement, SAP provides what they call "user exits" and in newer versions of the software, there are "enhancement points." These are places in the standard programs where you "exit" the standard processing to influence, change, or add additional data to the processing stream. You then re-enter the standard SAP application code and finish the processing with your customer-specific changes. This type of change requires custom programming and is very different from normal configuration activities.

What Does Configuration Look Like?

While this is an oversimplification, the entry of parameters within various Microsoft products is very similar. SAP configuration is not significantly different from how a user might adjust their version of Microsoft Word, Outlook, etc., by selecting different parameters for user-specific, pre-written options. For example you can configure Microsoft Word to hide (or show) tool tips, [53] or carry out spelling and grammar checks, or various other user-specific settings to personalize Microsoft's software products to your requirements:



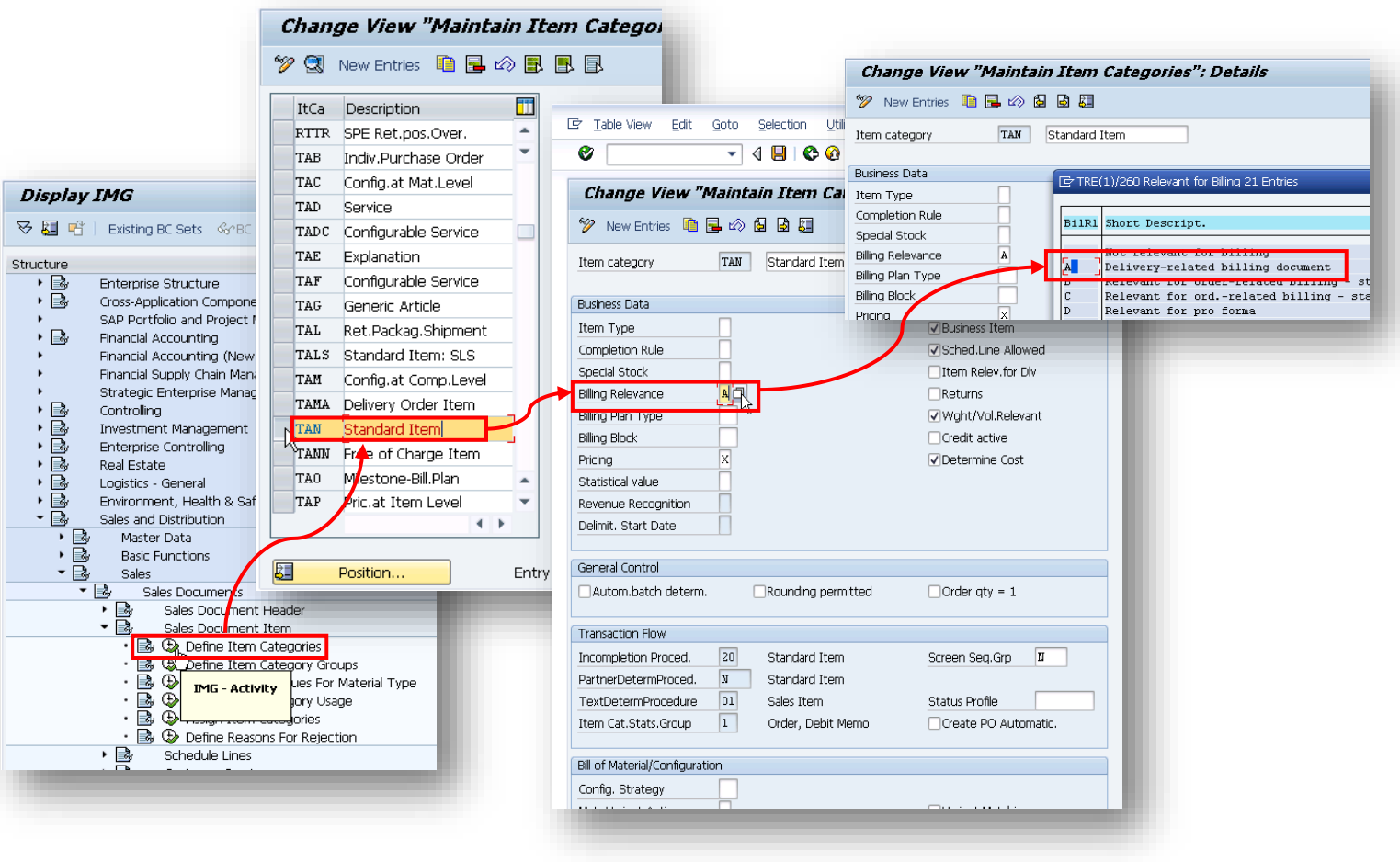
As parameters are entered or selections made the underlying programs that process them are not altered or changed into a new or different Microsoft Word program.

The same is true for SAP software. By entering parameter values, that the application was designed to process, does not alter or change the software so that it is somehow new or different. Without custom coding, the SAP parameters or data values entered, are already designed with the pre-written integration, to the corresponding modules within the system.

[53] These are small description boxes with text that "pop up" automatically when you hold the mouse cursor over one of the Microsoft Word buttons or tools.

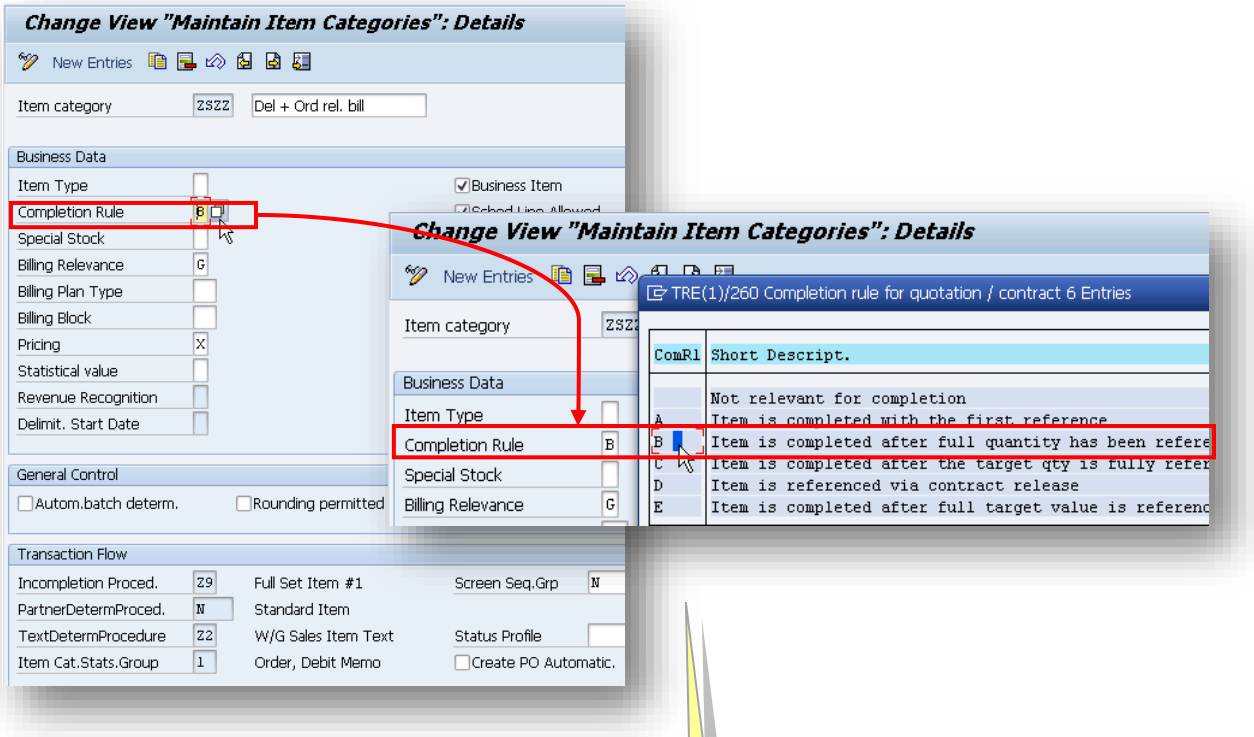
SAP configuration parameters and settings are stored in underlying database tables; they do not alter or change the software. These are *pre-delivered options, already contained in pre-written software*, with example or "template" parameters, are already entered in underlying database tables to copy from as necessary. The entry of parameter values or customer-specific settings (i.e. configuration) in the SAP software does not alter the pre-written programs.

The following illustration shows an SAP pre-delivered Standard Order item (called an Item Category). The item example below shows settings which control how an item is processed at order entry time.

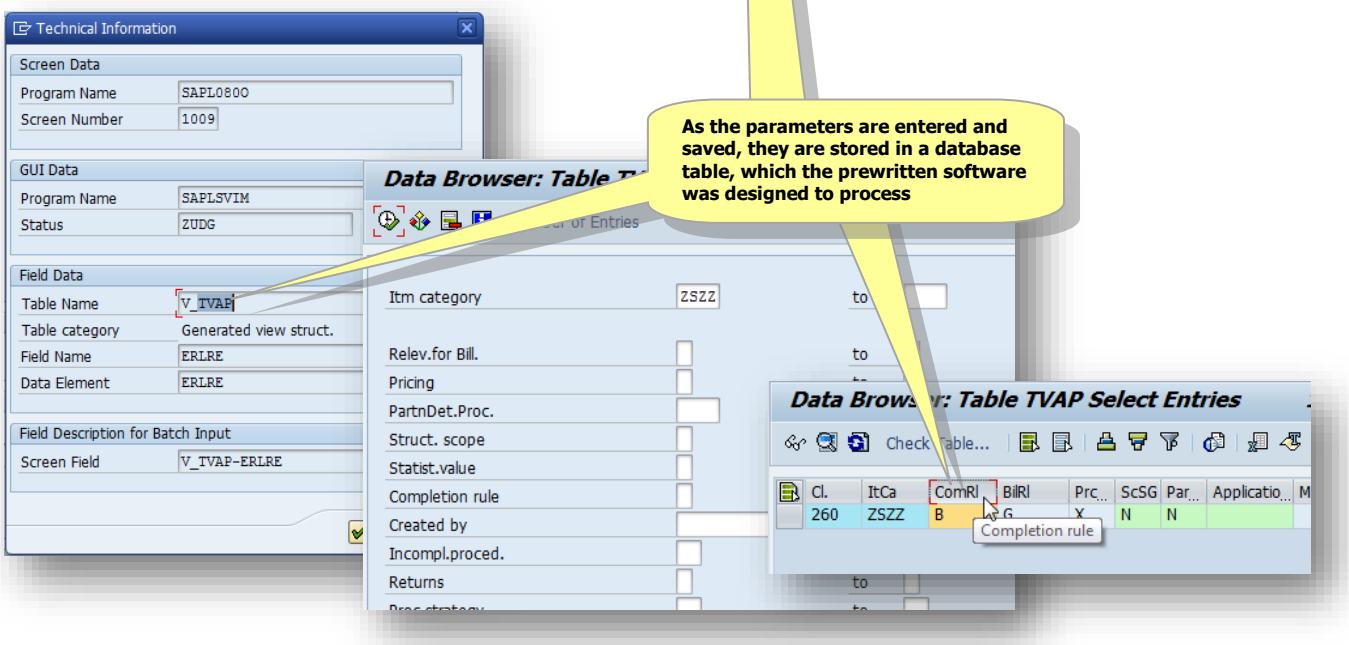


To adapt the item processing to a customer's specific requirements you select an existing and pre-defined item type, copy it, and then select different parameters to fit the requirement.

Custom Item (copied from a template item and entry of different parameters):



This example shows the "configuration" of a sales item that has a (processing) completion rule that states that the item becomes "closed" (or completed) only after the entire quantity has been processed. These values are then stored in an underlying database table which holds the customer specific values. When an order is processed with this item category (additional settings control how it is automatically determined), the pre-programmed software carries out the assigned functions.



The selected parameters become records in an underlying table (in this case, data table "TVAP"). The SAP software is pre-written to understand how to process these customer values stored in the database tables.

Automobile Analogy

An analogy may be helpful to understand configuration.

A car may have "programmable" seat settings that can be set and saved to each customer's preferences. There is a radio, possibly a CD player, maybe even some type of wireless (Bluetooth) phone connection. There are air conditioning and heating controls, and in some vehicles, they are separate for the passenger and the driver.

Each of the vehicle settings represents an option that is not unlike configuration. As a customer who purchases the vehicle you may make your seat memory settings so that when you get in the vehicle "remembers" you and automatically adjusts. You may choose radio stations and set the station "parameters" into the radio. You may decide to pair or connect your phone wirelessly to your car hookup. All of these items are customer specific parameters you determine and set up as a customer. None of these changes the car, or any component of the car, it merely accesses what the manufacturer already designed and incorporated as possibilities to be set to each customer's specific preferences or requirements.

To change or alter the vehicle into something new or different would require alterations to the original. For example, you might decide you want a remote starter put in your new car, or an upgraded stereo system from an outside installer. Maybe you want performance parts requiring engine work, or different tires, wheels, or paint that the dealer and manufacturer do not provide. This would be altering the car to make it new or different. You would not be using the Original Equipment Manufacturer (OEM) items but "aftermarket" items. It was not an available option when you purchased the vehicle so you had to go elsewhere to have it performed. In a similar fashion, when a customer needs new or different functionality than what is available in the SAP software they must rely on custom programming (or other software packages) to accomplish this.

Altering the original vehicle, like altering the SAP software through custom programming, might be considered "fabrication." Accessing and then using pre-defined options in the form of entering parameters does not change or alter the software so without custom programming of the pre-written software it is not new or different.

Opinion on Implementation

In response to the question:

(3) What does the term "implementation" mean in reference to ERP software?

Based upon the foregoing, and upon my experience and expertise, it is my opinion that an SAP implementation is a process that determines how the SAP software will be used. The process involves numerous meetings, discussions, and reviews of business methods to determine customer requirements. Through the gathering of these requirements, a "future state" blueprint is developed and the parameters are entered through configuration to facilitate the business processes that meet those customer requirements. Once a customer is ready, the system is deployed for wider use.

ISSUE FOUR

Is “implementation” distinct from “installation”?

Installation vs. Implementation

At its most basic the installation process makes the software available for use and the implementation process determines how the software will be used after it is installed.

Although the process of installing SAP software is more complex and takes longer than installing Microsoft Office, for example, the processes are similar.

The implementation process for SAP software is lengthier and involves efforts that are very different from the installation process. Some of the requirements include:

- understanding the business environment,
- understanding and planning for the business changes,
- facilitating a specialized solution to meet the customer's requirements,
- ensuring that the data is properly transformed from the old systems,
- testing to ensure the solutions will meet the requirements, and
- developing the requirements for any custom programming in its various forms.

Although this high-level bullet point list is not complete, all but the first two items require an installed system before the customer's solution can be implemented.

Skill Differences Between Installation and Implementation

The installation tends to be more technical in nature, requiring a fair amount of computer hardware and network infrastructure knowledge. Technical consultants do installation. Implementation requires less in the way of technical computer skills and more business function skills (accounting, inventory management, order processing, etc.). Functional consultants provide implementation services. Functional consultants provide professional services, which involve requirements gathering, deliberation, judgment, and decision-making. The functional consulting skills tend to require expert knowledge and customer specific service delivery.

The Basis person (or system administrator) performs the initial software installation. The functional consultant enters the parameters into the installed software as part of an overall process of implementation. That implementation process includes customer specific service delivery for the facilitation or fulfillment of those requirements through the application of expert knowledge. The parameter entry portion of an SAP implementation is referred to as configuration, and as outlined throughout, it represents an integrated portion of the customer specific design as part of the overall implementation effort.

Opinion on Installation vs. Implementation

In response to the following question:

(4) Is "implementation" distinct from "installation" (and how)?

Based on the foregoing, and upon my experience and expertise, it is my opinion that implementation is a process that determines how the software will be used. Implementation is different from installation, which is placing it on computer hardware from which it will be executed. The difference is illustrated by the fact that SAP has different manuals for installation and implementation. In addition, the tasks are performed by different personnel, requiring different skills and experience.

Blueprinting is part of implementation and is essentially a consulting process to create an overall solution design. Blueprinting occurs independent of the installation process. The Blueprint leads to configuration, which is the process of implementing pre-written software options to customize the experience of using the software without writing new software code. In my opinion, the implementation process with attendant functions of blueprinting and configuration are not installation within the industry.

ISSUE FIVE

What does the term “fabricate” mean in the ERP consulting industry, and do consultants “fabricate” software when they perform blueprinting and configuration services?

SAP Software Fabrication

There is no widely accepted industry definition for the term "fabrication" as it relates to SAP software or service delivery. However, *if fabrication means to alter or change the SAP software so that it is somehow new or different*, this can be evaluated within widely accepted industry practices.

As discussed above, the process of blueprinting and configuration does not alter or change the SAP software. Blueprinting is essentially a consulting process leading to a framework for transitioning from the existing systems to the "To-Be" systems for running the business using SAP. Configuration is the process of setting options (i.e., parameters) that are built into the SAP software as it exists "out of the box." The software itself is not altered or changed. In addition, blueprinting and configuration do not in any way assemble modules. The modules are collections of programs, representing a set of related business functions, accessed by processing codes called transactions, which are already integrated in the SAP software "out of the box."

Altering or Changing the SAP Software so it is New or Different

Sometimes an SAP customer wants the software to perform functions that are not built into the software. This requires custom programming. SAP provides custom programming options for altering or changing the software (generally referred to as "Enhancements"), to make it new or different in three (3) primary ways:

- User Exits
- Enhancement Points
- Customer Modifications

All three (3) of these options involve custom programming and custom code writing in SAP's proprietary programming language of ABAP, and in some cases custom programming in Java. These types of activities are performed by technical consultants. Technical consultants are generally programmers who develop ABAP, Java, or other types of software coding.

This technical effort is different and distinct from the activities performed by "functional consultants." Functional consultants generally perform the pre-written software configuration, or provide training, expert knowledge, and advisory services to a customer who performs the configuration. Configuration does not alter or change SAP software.

RICEF(W) Custom Programming to Meet Customer Requirements

As part of the Blueprint Phase, the functional consultants identify gaps or customer requirements that are specialized so that the pre-written software needs to be changed or altered to meet the requirement. This inventory of gaps generally becomes a list of

requirements often referenced by the acronym RICEF(W). In some cases, the letters may be arranged differently but it is commonly understood to stand for:

- **R**eports
- **I**nterfaces
- **C**onversions
- **E**nhancements
- **F**orms
- **W**orkflow

The acronym is easy to remember but does not follow the sequence of activities within an implementation. I have altered the sequence below to follow the normal project sequence as they commonly occur (most projects develop reports toward the end of the implementation process, even after the system is live in some cases).

Conversions

Data conversions from an existing system into the SAP software follows an industry standard practice referred to as "ETL" or **E**xtract, **T**ransform, and **L**oad. The data **E**xtraction is generally performed using custom extract programs which then directly interface to the SAP software, or go through some type of specially designed software for handling data transformation. In either case, after the data is extracted, numerous **T**ransformation steps are performed on the data; it is then ready to **L**oad into the SAP software.

The conversion logic, which **T**ransforms the **E**xtract system data, is developed by the functional consultants during the configuration and implementation process. During the design and setup (or entry of parameters) functional consultants develop detailed data models with dependencies, exceptions, data value changes, value determination rules for new data which does not exist, transformation of existing data into a format which SAP supports, or *completely altering existing data* to support completely new data models. Sometimes this is done manually in spreadsheets, through middleware, through SAP pre-delivered data conversion tools, and sometimes through custom programming. The data that starts from one system is often significantly altered, supplemented, summarized, or otherwise changed by the time it enters the SAP software.

Enhancements

An Enhancement consists of custom programming within the SAP software and generally falls into the three areas:

- User Exits
- Enhancement Points
- Customer Modifications

User Exits in SAP, in a generic sense, are places in the SAP pre-written software that "exit" the normal program processing flow. This allows customers to custom program their own specific requirements and then return back to continue processing in the pre-written software code.

Enhancement Points are newer than user exits and consist of predefined locations in the pre-written software that allow for direct introduction of new coding requirements. They are very similar to the User Exit option but are instead placed at various locations in the direct code-processing stream. There are also substantially more Enhancement Points allowing for more detailed customer-specific processing control.

Customer Modifications are performed when there is a very specific customer requirement, which requires a change to the core SAP pre-written software. This type of change involves software adjustments that cannot be performed in the normal User Exit or Enhancement Point locations.

All custom coding which affects SAP processes (whether a User Exit, Enhancement Point, or Customer Modification) go through a special "registration" process where every change is tracked by SAP and they provide special "control codes" which are placed into the customer's changed system before the SAP software will accept the changes. These types of changes can occur as part of the overall implementation, or they can be carried out by the customer, as new requirements arise after the implementation is complete, and service providers have left.

Enhancements are generally defined by the functional consultants during the course of the blueprint (if they are discovered at that time) or during configuration of the system when a particular customer requirement needs additional processing requirements.

Interfaces

Like data conversions, the Interfaces can be custom programmed or use middleware. Unlike Enhancements however, these interfaces tend to involve automated data transfer requirements between SAP software and other software systems.

There are some interfaces between different types of SAP software for which SAP has pre-developed and delivered working interfaces. In these cases, the effort involves any custom requirements that might need to be passed from one piece of SAP software to the other.

As part of the blueprint process, the systems that will remain and the portion of the business functions they retain are defined by the functional consultants. Some companies keep entire existing systems intact, they replace part of the functionality, or they may use entirely different pre-written software applications as part of their implementation project.

Forms

Forms are generally "output" documents. They are much like your phone bill, electric bill, or other types of printed correspondence. However, in SAP the idea of "Forms" can also include electronic documents that are dynamically generated to meet a customer's specific requirements. In the banking world, an online account statement for a credit card could be a type of "Form." Other types of online content can also be a "form" in SAP. Unless the pre-delivered templates provided by SAP are accepted as they are, the form development involves custom coding to satisfy customer specific layouts.

Workflows

Workflows involve the automated notifications of work-steps. This involves sets of rules or conditions to determine how a business-processing stream is handled. These are data processing automation steps, which can occur inside or outside of the SAP software. For example if you are a department manager and someone in your area enters a requisition for a new printer or computer you may get an automated e-mail notice (which could be another type of Form) providing the details of the requisition and with hyperlinks or buttons allowing you to approve, reject, or request more information. In turn, the appropriate steps would be carried out in the SAP software and another workflow or notification could be sent to the user who entered the requisition notifying them of the results.

These automated data processing steps are defined during the blueprint process, or may occur as a further requirement during configuration. For example as the parameters are being entered in the system (configuration), under the new design, with the new data models, it may be discovered that additional automation steps are needed.

Reports

Reporting efforts in SAP are generally broken out into two types--, there are "online" reports and "batch" reports. The online report is a real-time report generated directly from the SAP software. This type of report is usually needed when you have a key, real-time business requirement such as fulfilling a customer service request while the customer is on the phone or on site. The batch report generally has a (one) 1 day delay because the day's business transaction processes are extracted out to a separate reporting system.

The various summaries, requirements, data transformations, calculations, and results for the reports are defined during the blueprint process but, as with the other areas, as new requirements are discovered during the course of configuration additional options or reports may be defined.

Opinion on Fabrication

The following question was presented for analysis:

> (5) What does the term "fabricate" mean in the ERP consulting industry, and do consultants "fabricate" software when they perform blueprinting and configuration services?

Based on the foregoing, and upon my experience and expertise, it is my opinion that the term "fabrication" has no widely accepted definition in the ERP context. If it means to "alter or change" the software, then the term refers to custom programming. RICEF(W), as discussed above, generally involves custom programming. This is distinct from blueprinting and configuration, which do not "alter or change" the SAP software into something new or different.

In particular, blueprinting and configuration of SAP software do not involve assembling software modules. As discussed previously, the software modules are already "assembled" in the software when SAP licenses it.

Therefore it is my opinion that performing blueprinting, configuration activities, and other project implementation activities (to the extent they do not involve custom programming), do not constitute fabrication. However, custom programming may involve fabrication.

Respectfully submitted,

this the 30th day of January, 2013,

Bill Wood – President
R3Now Consulting, LLC.

Appendix A

The SAP Retail Sale to Best Buy (Products)

Several SAP software products were purchased from SAP Retail by Best Buy. Those purchases and contract dates are listed below:

8/27/07	Payroll Processing, Merchandising for Retail & Wholesale Distribution, POS Data Management for Retail & Wholesale Distribution, Service Management for Retail & Wholesale Distribution, Transactionware for General Merchandise for Retail, GR&C - Virsa Compliance Calibrator, Netweaver B1 Accelerator, Test Data Migration Server (TDMS), Forecasting & Replenishment for Retail & Wholesale Distribution, Marketing for Retail & Wholesale Distribution, Sales Management for Retail & Wholesale Distribution, GR&C - Virsa Access Enforcer, GR&C Process Control, Extended Sourcing for Retail & Wholesale Distribution,
8/27/07	SAP Central Process Scheduling by Redwood
5/20/08	SAP Productivity Pak by RWD & SAP Productivity Pak Help Launchpad by RWD
6/27/08	SAP Payroll Processing, SAP Merchandising for Retail & Wholesale Distribution, SAP POS Data Management for Retail & Wholesale Distribution, SAP Service Management for Retail & Wholesale Distribution, SAP Governance Risk & Compliance - Virsa Compliance Calibrator, SAP Netweaver B1 Accelerator, SAP Test Data Migration Server (TDMS), Virsa Access Enforcer for SAP, SAP Exchange Infrastructure (XI - Base Engine)

A brief explanation of the products and their purposes are provided below. Most of these products are part of the ERP Retail Solution.

ERP Component for ERP Package

- The ERP component is the main software package and "back office" foundation for the SAP application suite.

External Sourcing, SAP Forecasting and Replenishment

- Sourcing, forecasting, and replenishment of store stocks.

Sales & Service Management

- Web channel Sales and Service management, including both B2B (Business to Business) and B2C (Business to Customer) access.

Payroll

- Employee payroll processing.

Redwood Central Process Job Scheduler

- Automated batch (program) job scheduling.

SAP GRC (Governance, Risk and Compliance)

- GRC helps to reduce risk and compliance violations.

Virsa

- Virsa enhances system security and authorization.

Adobe Forms

- Adobe "engine" for processing PDF (Portable Document Format) forms

SAP Merchandising for Retail & Wholesale, SAP POS for Retail, SAP POS Data Management f. R&W and Transactionware for General Merchandise

- Store level operations management to ensure products and store activities are managed.
- These software options form solutions for store-level management to handle in-store and back-office functions such as reporting, time and attendance-tracking, file maintenance, cash management, label and sign printing, and store-level inventory control.
- Cash register sales data from individual store locations to be transmitted to back-office systems on a regular basis throughout the business day.
- Electronic funds transfer, returns processing, and points or loyalty programs.

Netweaver BI Accelerator

- In memory database and analytics processor (a predecessor to SAP's current "HANA" in memory offering).

SAP XI

- SAP Exchange Infrastructure which is a "middleware" interface application to connect different types of data and systems together (generally SAP software to non-SAP software systems).

SAP Test Data Migration Server

- Testing platform for carrying out, monitoring and managing tests on various types of systems (SAP and non-SAP) including on handheld devices.

RWD Productivity Pak and Help Launchpad

- Automated solution for developing training, support, and help materials.

Appendix B

Document Review

Date	Name	Description
8/27/2007	SAP Software License Agreement	License agreement including Terms and Conditions
8/27/2007	Appendix 1 to SAP Retail License Agreement (of 8/27/2007)	Software licensing agreement for various SAP ERP related products
8/27/2007	Appendix 2 to SAP Retail License Agreement (of 8/27/2007)	Software licensing agreement for Redwood Scheduling Software
5/30/2008	Appendix 3 to SAP Retail License Agreement (of 8/27/2007)	Software licensing agreement for SAP Productivity Pak / RWD software
6/27/2008	Appendix 4 to SAP Retail License Agreement (of 8/27/2007)	Software licensing for named user access and usage metrics
8/27/2007	SAP Professional Services Agreement with Best Buy	Primarily logistics arrangements around consulting delivery
	Auditor's Position	Minnesota Tax Auditor's position on taxability of Best Buy purchases
11/5/2007	Change Order 1 to Statement of Work (of 8/27/2007)	Professional Services agreement for various consultants
12/5/2007	Change Order 2 to Statement of Work (of 8/27/2007)	Professional Services agreement for various consultants
1/10/2008	Change Order 3 to Statement of Work (of 8/27/2007)	Professional Services agreement for various consultants
	Minnesota Department of Revenue Interrogatories on Installation	Reviewed answers 5, 6, 7, 9, and 12
	SAP Resource Planning 5/26/08 - 2/9/09	Staffing, schedules, and area of responsibility for consultants by project phase
	Resource Utilization 4/21/08 - 11/21/08	Detailed on site staffing, remote, vacation schedule, etc.

Exhibit 1

2007 SAP Installation Guide available to Best Buy during the period of their SAP related services.

PUBLIC

Installation Guide

SAP ERP 2005 SR2 ABAP+Java on Windows: MS SQL Server

Including:

ERP Central Component
ERP Biller Direct (BD)
ERP Business Packages (Portal Content)
ERP Learning Solution Content Player (LSOCP)
ERP Extended E-Selling Components (XECO)
ERP Self Services (XSS)
SAP NetWeaver Application Server ABAP (AS ABAP)
SAP NetWeaver Application Server Java (AS Java)
SAP NetWeaver Business Intelligence Java Components (BI)
SAP NetWeaver Development Infrastructure (DI)
SAP NetWeaver EP Core (EPC)
SAP NetWeaver Enterprise Portal (EP)
SAP NetWeaver Mobile Infrastructure (MI)
SAP NetWeaver Process Integration (PI)
Application Sharing Server (Optional Standalone Unit)

Target Audience

- System Administrators
- Technical Consultants

Document version: 1.10 – 04/20/2007

SAP AG
Dietmar-Hopp-Allee 16
69190 Walldorf
Germany
T +49/18 05/34 34 34
F +49/18 05/34 34 20
www.sap.com

This document was created using stylesheet 2006-12-31 (V5.1) and XSLT processor SAXON 6.5.2 from Michael Kay (http://saxon.sf.net/), XSLT version 1.

Disclaimer

Some components of this product are based on Java™. Any code change in these components may cause unpredictable and severe malfunctions and is therefore expressively prohibited, as is any decompilation of these components.
Any Java™ Source Code delivered with this product is only to be used by SAP's Support Services and may not be modified or altered in any way.

Legal Software Terms

Terms for Included Open Source Software

This SAP software contains also the third party open source software products listed below. Please note that for these third party products the following special terms and conditions shall apply.

1. **This software was developed using ANTLR.**
2. **SAP License Agreement for STLport**
   SAP License Agreement for STLPort between

SAP Aktiengesellschaft
Systems, Applications, Products in Data Processing
Dietmar-Hopp-Allee 16
69190 Walldorf, Germany
(hereinafter: SAP)
and
you
(hereinafter: Customer)

a) Subject Matter of the Agreement

A) SAP grants Customer a non-exclusive, non-transferrable, royalty-free license to use the STLport.org C++ library (STLport) and its documentation without fee.

B) By downloading, using, or copying STLport or any portion thereof Customer agrees to abide by the intellectual property laws, and to all of the terms and conditions of this Agreement.

C) The Customer may distribute binaries compiled with STLport (whether original or modified) without any royalties or restrictions.

D) Customer shall maintain the following copyright and permissions notices on STLport sources and its documentation unchanged:
Copyright 2001 SAP AG

E) The Customer may distribute original or modified STLport sources, provided that:
- The conditions indicated in the above permissions notice are met;
- The following copyright notices are retained when present, and conditions provided in accompanying permission notices are met:
  Coypright 1994 Hewlett-Packard Company
  Copyright 1996,97 Silicon Graphics Computer Systems Inc.
  Copyright 1997 Moscow Center for SPARC Technology.
  Copyright 1999,2000 Boris Fomitchev
  Copyright 2001 SAP AG

Permission to use, copy, modify, distribute and sell this software and its documentation for any purposes is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Hewlett-Packard Company makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

Permission to use, copy, modify, distribute and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Silicon Graphics makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.
Permission to use, copy, modify, distribute and sell this software and its documentation for any purposes is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Moscow Center for SPARC makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.
Boris Fomitchev makes no representations about the suitability of this software for any purpose. This material is provided "as is", with absolutely no warranty expressed or implied. Any use is at your own risk. Permission to use or copy this software for any purpose is hereby granted without fee, provided the above notices are retained on all copies. Permission to modify the code and to distribute modified code is granted, provided the above notices are retained, and a notice that the code was modified is included with the above copyright notice.
Permission to use, copy, modify, distribute and sell this software and its documentation for any purposes is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. SAP makes no representations about the suitability of this software for any purpose. It is provided with a limited warranty and liability as set forth in the License Agreement distributed with this copy. SAP offers this liability and warranty obligations only towards its customers and only referring to its modifications.

b) Support and Maintenance
SAP does not provide software maintenance for the STLport. Software maintenance of the STLport therefore shall be not included.

All other services shall be charged according to the rates for services quoted in the SAP List of Prices and Conditions and shall be subject to a separate contract.

c) Exclusion of warranty
As the STLport is transferred to the Customer on a loan basis and free of charge, SAP cannot guarantee that the STLport is error-free, without material defects or suitable for a specific application under third-party rights. Technical data, sales brochures, advertising text and quality descriptions produced by SAP do not indicate any assurance of particular attributes.

d) Limited Liability

A) Irrespective of the legal reasons, SAP shall only be liable for damage, including unauthorized operation, if this (i) can be compensated under the Product Liability Act or (ii) if caused due to gross negligence or intent by SAP or (iii) if based on the failure of a guaranteed attribute.

B) If SAP is liable for gross negligence or intent caused by employees who are neither agents or managerial employees of SAP, the total liability for such damage and a maximum limit on the scope of any such damage shall depend on the extent to which its occurrence ought to have anticipated by SAP when concluding the contract, due to the circumstances known to it at that point in time representing a typical transfer of the software.

C) In the case of Art. 4.2 above, SAP shall not be liable for indirect damage, consequential damage caused by a defect or lost profit.

D) SAP and the Customer agree that the typical foreseeable extent of damage shall under no circumstances exceed EUR 5,000.

E) The Customer shall take adequate measures for the protection of data and programs, in particular by making backup copies at the minimum intervals recommended by SAP. SAP shall not be liable for the loss of data and its recovery, notwithstanding the other limitations of the present Art. 4 if this loss could have been avoided by observing this obligation.

F) The exclusion or the limitation of claims in accordance with the present Art. 4 includes claims against employees or agents of SAP.

3. **Adobe Document Services**

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and / or other countries. For information on Third Party software delivered with Adobe document services and Adobe LiveCycle Designer, see **SAP Note** 854621.

4. **Apache License, Version 2.0**

a) Definitions:

- "License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.
- "Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.
- "Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.
- "You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.
- "Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.
- "Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.
- "Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).
- "Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For

the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

- "Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."
- "Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

b) Grant of Copyright License
Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

c) Grant of Patent License
Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

d) Redistribution
You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

A) You must give any other recipients of the Work or Derivative Works a copy of this License; and

B) You must cause any modified files to carry prominent notices stating that You changed the files; and

C) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

D) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution

of the Work otherwise complies with the conditions stated in this License.

e) Submission of Contributions
Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

f) Trademarks
This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

g) Disclaimer of Warranty
Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

h) Limitation of Liability
In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

i) Accepting Warranty or Additional Liability
While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

Documentation in the SAP Service Marketplace

You can find this document at the following address:
https://service.sap.com/instguides

Typographic Conventions

Example	Description
< >	Angle brackets indicate that you replace these words or characters with appropriate entries to make entries in the system, for example, "Enter your <User Name>".
	Arrows separating the parts of a navigation path, for example, menu options
Example	Emphasized words or expressions
Example	Words or characters that you enter in the system exactly as they appear in the documentation
Example	Textual cross-references to an internet address, for example, http://www.sap.com
/example	Quicklinks added to the internet address of a homepage to enable quick access to specific content on the Web
123456	Hyperlink to an SAP Note, for example, SAP Note 123456
Example	■ Words or characters quoted from the screen. These include field labels, screen titles, pushbutton labels, menu names, and menu options. ■ Cross-references to other documentation or published works
Example	■ Output on the screen following a user action, for example, messages ■ Source code or syntax quoted directly from a program ■ File and directory names and their paths, names of variables and parameters, and names of installation, upgrade, and database tools
EXAMPLE	Technical names of system objects. These include report names, program names, transaction codes, database table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE
EXAMPLE	Keys on the keyboard

Document History

 Caution

Before you start the implementation, make sure you have the latest version of this document. You can find the latest version on SAP Service Marketplace http://service.sap.com/instguides.

The following table provides an overview on the most important document changes:

Version	Date	Description
1.10	4/20/2007	Updated Version It is now possible to run usage types "Business Packages for ERP" (BP ERP) and "Self Services" (XSS) directly on usage type EP Core (EPC). You do no longer have to install an SAP system with usage type EP as a prerequisite for BP ERP and XSS.

Table of Contents