

IBM Research Report

Improving SAP Projects with Model-Driven Technologies for Global Delivery

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Abstract

In order to support global delivery of goods and services, enterprises are moving to consolidate and harmonize their IT infrastructure around packaged applications, such as SAP. With a common infrastructure and harmonized business processes, an enterprise is globally integrated and can service its customers in a way that best leverages its global resources, at a reduced cost and with better visibility into its global operations. The worldwide market for implementing such transformations is very large and mature, yet continues to grow quickly. Service engagements in this domain are intrinsically complex due to the sheer number of available business processes, transaction and configuration options. Moreover, understanding the current “as-is” state of a business is difficult because of the number and variety of IT systems in use and the customizations done to these systems by clients. Defining the desired “to-be” state and deciding the required steps to evolve from “as-is” to “to-be” is time-consuming, and therefore expensive. In part, this is due to the widespread use of general productivity tools, such as MS Word, PowerPoint and Visio, which have very limited analysis capabilities, are not designed for the task at hand and do not promote asset and knowledge reuse.

This paper describes a comprehensive approach to SAP engagements based on model driven tools which enable efficient global delivery. The tools are collectively called IBM’s Next Generation Tools for SAP Deployment. The tools consist of the Solution Workbench, the Hierarchy Wizard and the Reusable Asset Library. The Solution Workbench can connect to one or more SAP systems and extract, analyze and compare existing implementations, in order to establish the “as-is” business processes. To assist with creating the “to-be” business processes, the Asset Library provides practitioners with access to a large base of approximately 14,000 assets which embodies the collected experience of IBM’s SAP practice and enables faster delivery with improved quality. The library provides semantic based classification, automatic migration of assets from legacy stores to standards based on Rational Asset Specification, RAS. The Hierarchy Wizard provides a graphical interface for viewing, manipulating and merging Organization Hierarchy configurations. It allows clients to visualize their business organization, to compare models from different systems, to directly manipulate the model to reflect the current business structure and finally to automatically configure SAP using the model. Finally, The solution workbench provides mechanisms for reusing client developed assets, like custom code and configuration, when building the “to-be” system.

1 Introduction

An Enterprise Resource Planning (ERP) system is a packaged application that provides common business functions and processes. The value proposition for adopting an ERP system is two fold: the packaged application embodies industry best practice processes, allowing an enterprise to leverage the experience of others; it is also less expensive and risky to license a packaged application rather than develop and maintain a custom application.

According to AMR Research [6], the total ERP market size is currently \$34.4B. From the point-of-view of business functions, the market is divided between general ERP systems (55%), Customer Relationship Management (CRM) (18%),

Human Capital Management (HCM) (14%), Supply Chain Management (SCM) (8%), and others (5%). From the point of view of ERP providers, SAP leads with 42 %, followed by Oracle (23%), The Sage Group (7%), Microsoft Dynamics (4%), and others. This paper focuses on SAP engagements, but the approach is applicable to any packaged application.

SAP provides a comprehensive set of pre-defined business processes, reports and integration connectors[3]. SAP's Solution Composer tool (ver. 2.11.14) lists about 620 processes in about 26 industries, which can be implemented using approximately 52,000 ERP transaction codes and 81,000 database tables (in SAP ver. 5.0¹). As a result, all SAP services engagements are intrinsically complex due to the sheer size of the system. In addition, SAP systems are highly configurable and allow the clients to run custom application code to meet requirements not addressed by the pre-defined business processes. Consequently, no two SAP deployments are ever the same, so consolidating and harmonizing systems is a non-trivial task, involving significant investments of time and money. Despite the cost, consolidating and harmonizing SAP systems within an enterprise enables the enterprise to become more globally integrated, reducing costs, improving visibility into global operations and enabling global delivery of goods and services.

In order to consolidate and harmonize SAP systems within an enterprise, the current "as-is" infrastructure landscape needs to be identified and understood. The desired "to-be" state of the infrastructure can then be defined along with a roadmap of how to get there. Understanding the current landscape is complicated by the fact that existing systems likely originated from different sources. In some cases, individual business units purchased and configured SAP systems to serve the needs of a particular division or the operations in a particular country. In other cases, enterprises have acquired SAP systems when they acquired other companies. The original designs for these systems and the people who configured them may no longer be available. Even if original design information is available, the systems may have evolved to such an extent that the original designs no longer reflect current operations.

Current practice for capturing the "as-is" state, defining the "to-be" state and designing the required steps to evolve from "as-is" to "to-be" are time-consuming because the states are recorded using simple productivity tools (e.g., PowerPoint, Word, and Visio) which have very limited analysis capabilities. The resulting designs are in human readable form, but can not be used to directly combine configuration from multiple systems or configure the "to-be" system.

This paper describes a set of tools that address the challenges of consolidating and harmonizing SAP systems in three ways, collectively called IBM's Next Generation Tools for SAP Deployment. First, it provides model based tools to extract and analyze SAP configurations and code customizations from deployed systems (called Solution Workbench). Second, it provides the ability to select, combine and directly re-use configuration elements and custom code from existing SAP implementations (called Hierarchy Wizard). Finally, it provides an extensive library of process designs and other reusable assets to reduce the time and improve the quality of the "to-be" solution (called ReAL).

The rest of the paper is organized as follows. Section 2 describes an example of an SAP engagement. Sections 3, 4, and 5 explain how the challenges present in delivering a globally integrated solution are addressed by a set of novel ideas. Then, we present our initial experience with employing the implementation of these ideas in live engagements. The paper ends with a summary of the state of art in the field and conclusions.

2 Motivating Scenario

In order to better understand both the challenges of globally delivering SAP systems and the proposed solution, this section describes a typical SAP engagement. The client in the engagement is a multinational corporation, Acme, which has presence in 100 countries around the world. The company started as a small manufacturer of widgets based in the USA, and increased revenue and global presence through a combination of acquisitions of international companies and growth of its own operations. Acme also grew by extending its own operations to cover the entire widget value network, from design to manufacturing and distribution. Unfortunately, this rapid growth created a fragmented IT landscape of multiple SAP instances running overlapping processes and extensive customizations. In order to reduce the costs of maintaining such a complex IT infrastructure, Acme company decides to harmonize its SAP systems by consolidating all operations on a single server and adopting industry best practices. After an initial assessment, the company had decided to do a staged rollout. *Finance & Accounting* was identified as the first area for harmonization. Acme currently has 8 SAP systems used to do finance and accounting. Three of these support the main divisions in North America. The remaining 5 handle operations in England, mainland Europe, Asia, Japan and Latin America. The deployment plan is to identify the harmonized processes for this area, then to implement them and roll them out to North America first. Using the configuration data for North America as a template, the system will be rolled out to Europe, Asia, and South America over the next 2 years.

¹There are many factors which affect the actual number.

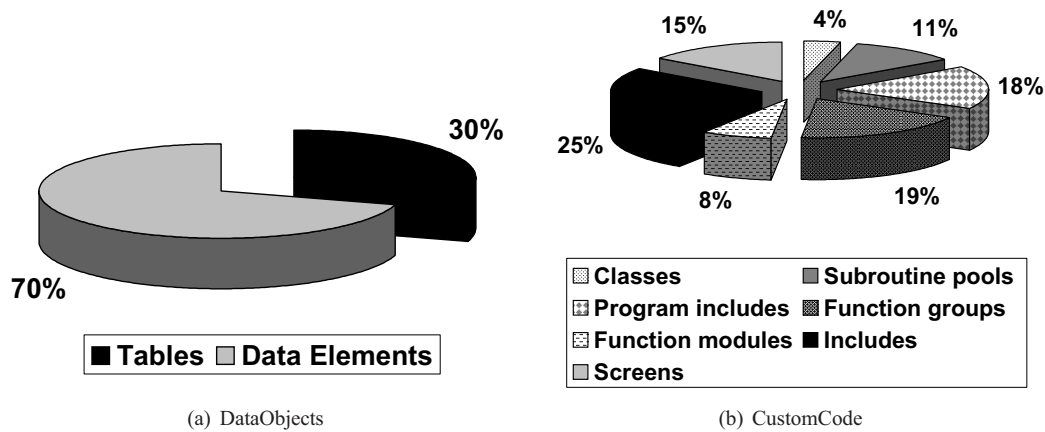


Figure 1. Reports generated by Solution Workbench for data and code customizations

In this example, the challenges of the harmonization process are two-fold: (1) the client company has a highly complex infrastructure which is rapidly changing, and (2) the service provider needs to build the best solution while keeping its costs low. To address these issues, section 3 focuses on discovering the client’s IT landscape. Following the discovery phase, Section 4 describes how the reusable asset library facilitates knowledge reuse. Finally, section 5 describes how to reuse customization and configuration to deliver a harmonized system.

3 Analyzing Current Landscape

In order to consolidate and harmonize an enterprise IT infrastructure, the overall structure or landscape of the existing IT infrastructure must be determined. In general, the first critical question to be answered is how many systems exist and what are their types. In particular, the existence of large ERP systems, like SAP, is generally well known because of the large infrastructure needed to support them, the business critical nature of the systems and the substantial license and maintenance fees. The next critical question is to determine how much effort is necessary to harmonize all existing systems and which business functions are supported by the SAP systems.

The main challenge in answering the latter question and determining the “as-is” state of an SAP system is being able to extract only the programs, data tables, and configurations that are important to the client from the large number of standard SAP entities. The core idea of the Solution Workbench is based on the insight that SAP systems come with predefined/configured entities, and clients enrich these entities by *adding* new business processes, business process steps, transactions, data rows, and programs. Thus, the customizations can be identified by comparing an existing SAP system (e.g., client 100) with an out-of-the-box system (e.g., client 000).

The Solution Workbench provides insights about the client “as-is” state at both the business and the IT levels, by enabling consultants to extract four types of customizations: (1) Business Process Hierarchies (BPH), (2) configurations (called Implementation Guide or IMG), (3) ABAP programs, and (4) data objects. In all cases, consultants can use the Solution Workbench to create a remote connection to any SAP system, extract the necessary data on their local machine, execute the compare operation, and visualize the results using standard Web browsers. Based on the results of the compare, the Solution Workbench can generate reports about the complexity of the system and provide a rough estimate on the complexity of harmonization process. Figure 1 illustrates the summary report generated for data and code customizations, respectively.

In addition to estimating the harmonization effort, consultants can also use the Solution Workbench to identify which business processes contain activities that are performed to accomplish a task. In the Finance & Accounting domain, such processes could include “Retail Pricing”, “Order Processing for Make to Order Goods”, and “Returns Handling”. These processes are generally well known in the business community, but the exact set of required and optional activities for each process varies widely, and are not explicitly represented in the systems to be analyzed. The Solution Workbench helps in identifying the business processes relevant for one client, by allowing consultants to define a basic BPH that contains a standard set of processes and steps for the client industry. The general structure of a BPH is: *Business Scenario* → *Business*

Scenario (Process)	North America		Europe		South America		Asia		Total
	Conf	Use	Conf	Use	Conf	Use	Conf	Use	
Account Management									
Account Planning in CRM	1				1				2
Complaints and Returns Analysis in CRM	1	1		1	1			1	5
Contract Processing in ERP			1			1	1		3
Customer Profitability Analysis	1	1		1	1			1	5
FI-AR: Handling Payment Deductions			1			1	1		3
Profitability Analysis in ERP	1	1		1	1			1	5
Order To Cash									
Assemble-to-Order Processing in ERP			1			1	1		3
Billing in ERP			1			1	1		3
Cash Management	1	1	1	1	1	1	1	1	8
Contract Processing in ERP			1			1	1		3

Table 1. Business Process Commonality Matrix

Process → *Business Process Step* → *Transaction*, where → indicates the parent-child relationship. The result of an IMG compare operation shows which *Transactions* are being executed as part of the daily enterprise operations. By combining these two sources of information, the Solution Workbench is able to select all business processes from a BPH which have at least one executed transaction and create a business process commonality matrix. Table 1 shows a section of the business process commonality matrix for Acme company, in the Finance & Accounting area. For each business process, the matrix shows whether they are configured or used in their corresponding geography. For example, the “Contract Processing in ERP” process is configured in the SAP systems from Europe and Asia, and it has usage statistics associated in the South America SAP system.

4 Solution Definition Using Assets

The basic value proposition of using a packaged application like SAP is that a company is taking advantage of standard business processes and standard implementations to improve its business operations while reducing the cost and risk of building and maintaining a custom solution. In large part, this is accomplished by simply using the functionality built into the system. But this is not the whole story. An SAP system is highly configurable and extensible. With enough time and money it is possible to get the system to implement virtually any business function.

The key to success is to not only leverage the functionality provided by the system but to also leverage the work done on prior successful projects. *Reuse* of knowledge, business process variations, industry specific best practices and other design considerations naturally happens when consultants move from one project to the next. With personal reuse, the project team is as good and experienced as the members of the team. But they do not leverage the experience of the organization. A large services organization, like IBM’s Global Business Services, may have done hundreds of similar projects, while each team member may have only been involved in a few. Harvesting the results of an SAP implementation and making the knowledge available as re-usable assets is key to the growth and evolution of the organization’s corporate memory and knowledge.

To facilitate reuse on a wider scale, the Reusable Asset Library (ReAL) provides a central clearing house for finding relevant assets for a project and for harvesting and cleansing assets at the end of a project. The library provides faceted search, user ratings and other techniques to help consultants quickly find relevant assets.

One of the key elements of ReAL is the librarian functions. Unlike an open repository that simply hosts assets, the library is a managed collection. The librarians actively solicit and harvest assets from successful projects, with an eye to ensuring that the library has a breadth of content, with some focus on the areas that are of prime interest to the consultants. To better understand the importance of the librarian function, ReAL can be compared with a local public library that accepts donations of books. People donate to get tax deductions. But the library does not allow people to walk in and just start putting the donated books on the shelves. Instead, they sort the books, reject inappropriate and damaged books and in general maintain the quality and relevance of the collection to their users. Without a librarian, many corporate databases and repositories become dumping grounds. People are incented or required to submit “assets”, but no attention is paid to quality and the resulting collection quickly becomes unusable. In ReAL, the harvested assets are vetted for quality and cleansed of client

information. The assets are then cataloged and categorized to make finding them easier. The result is a collection of high quality assets that reduces the time needed to find relevant, high quality content, and thereby improves asset reuse.

Once the current landscape has been surveyed, and the scope of the harmonization project determined, the design for the to-be business processes need to be designed. Rather than starting from scratch, a good designer will start by modifying and combining elements from similar designs done in the past. In the project preparation stage, the business consultants will look for relevant process descriptions that describe how each process has been implemented and customized for prior clients. These process description documents (PDDs) provide information on the industry specific best practices and common process variants. They provide access to the collective knowledge of the consulting practice and allow less experienced consultants access to relevant, in context expertise. It is also known that these variants can be implemented in SAP and have been successfully deployed. Starting with one of these process variants reduces the design effort, but more importantly reduces the risk of failures and improves the quality of the resulting system. It helps to avoid design errors at design time, which is much more efficient than waiting to discover them at realization time. The value of the design is realized, even if there are no implementation assets available.

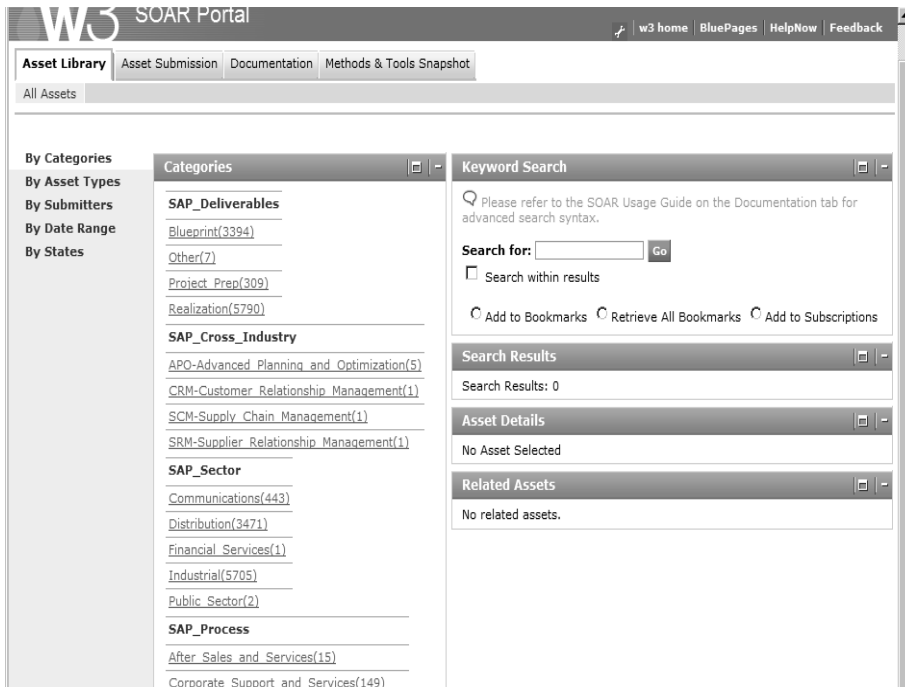


Figure 2. Reusable Asset Library

To get an idea of how someone selects assets, Figure 2 shows how a consultant has used the faceted search to navigate to the correct industry (manufacturing), the correct business area (finance) and asset type (PDD). At that point, several assets are available. The consultant can then narrow the search by doing a keyword search. Once a reasonable number of assets are in the result set, the consultant can view the assets and select any appropriate content. If nothing is appropriate, the consultant can relax the search. For example, by moving from the manufacturing industry to the industrial sector, the consultant will see process variants that are sector specific, but not industry specific.

The selected set of assets are used to illustrate the well know process variants and present options and recommendations to the client.

Which variants to select and recommend depends on the client situation and the judgment of the consultant. However, starting from a good set of assets reduces the effort needed to create the alternatives and improves the quality of the final result. These documents include not only the process variant definitions, but also the key performance indicators, the set of gaps, typical organizational impacts and detailed process flows.

When the to-be process designs are complete, and the relevant KPIs, organizational impacts and other detailed has been determine the blueprinting phase will be closed and the project moves into the realization phase. In that phase, the project will want to leverage the configuration and customizations that were identified when surveying the clients landscape. The next section describes how to leverage these client specific assets in building the harmonized system.

5 Reusing Configurations and Customizations

An increasing number of service providers acknowledge that the key idea in building a solution is re-using as much of the existing assets. In the case of SAP engagements, possible assets are IBM best practices, SAP standard assets, deliverables from past engagements, customizations from the client SAP systems.

The previous section described in detail how the consultants can search the ReAL repository and identify valuable assets. The next logical step is to build the new infrastructure by leveraging as much as possible any of the existing client investments.

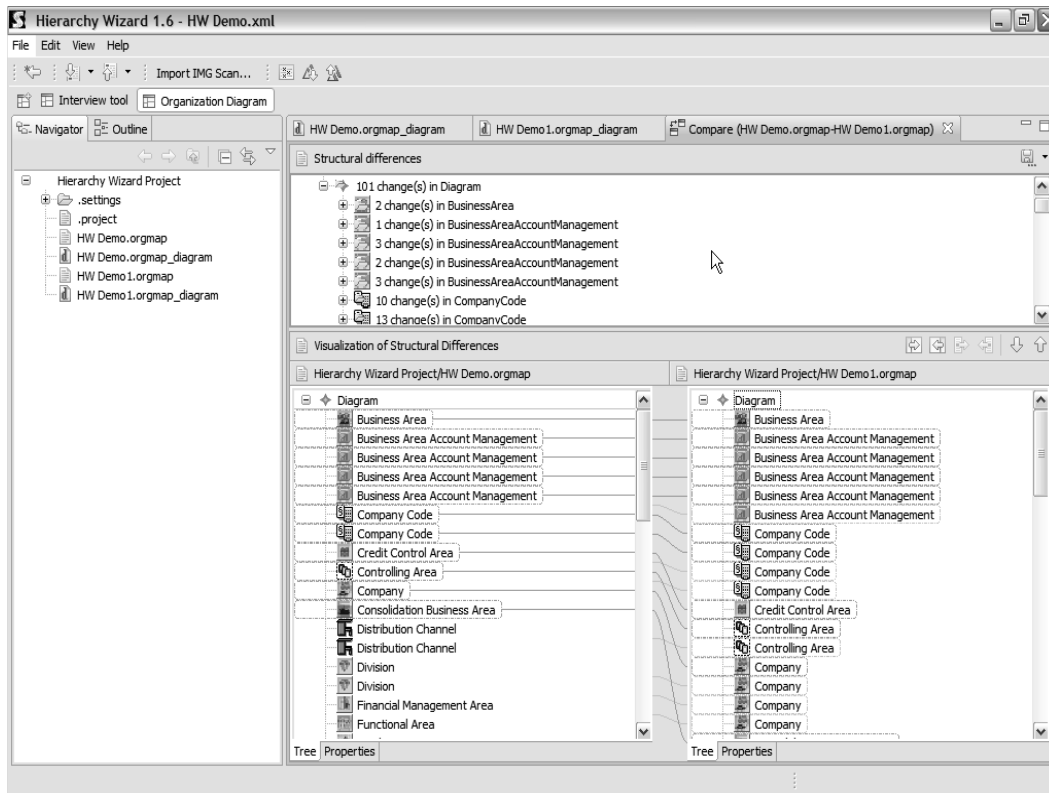


Figure 3. Hierarchy Wizard

Figure 3 show the Hierarchy Wizard tool for this purpose. In this view, the Hierarchy Wizard shows a side by side comparison of the two systems. The top pane shows that there are a total of 101 differences, with a breakdown of the differences by business object type. The lower pane shows the differences in detail and allows the differences to be reconciled and merged.

In the case of Acme company, the challenges are identifying which Finance & Accounting business process were modified through either configuration tables or custom code, and moving those customizations onto the new system.

- ▣ SAP Reference IMG (3217055, 5359963)
 - ▣ Activation Switch for SAP R/3 Enterprise Extension Set (2, 2)
 - ▣ General Settings (6825, 8507)
 - ▣ Set Countries (175, 175)
 - ▣ Define countries in R/3 Systems (77, 77)
 - ▣ V_T005 (77, 77)
 - ▣ Define Countries in mySAP.com Systems (CRM, EBP, APO, BW, SEM,...) (77, 77)
 - ▣ Set country-specific checks (5, 5)
 - ▣ Insert regions (6, 6)
 - ▣ Define country codes (5, 5)
 - ▣ Country Codes - Telephone: Define Exceptions (0, 0)
 - ▣ Country codes - telex: define exceptions (0, 0)
 - ▣ Define Mobile Telephone Attributes (5, 5)
 - ▣ Customize Geocoding (13, 13)
 - ▣ Currencies (42, 5)
 - ▣ Check units of measurement (37, 2316)

IMG Table: V_T005						
Filter: <input type="checkbox"/> Common records <input checked="" type="checkbox"/> New records <input checked="" type="checkbox"/> Changed records						
Title: V_T005						
Table V_T005 data						
City	Veh.	Altern.country key	Name	Long name	Nationality	F. Address Routine
AD	AND	043	Andorra	Andorran	Andorran	
AE	UAE	647	Utd.Arab Emir.	United Arab Emirates	Unit.Arab Emir. From the United Arab Emirates	
AF	AFG	660	Afghanistan	Afghan	Afghan	
AG	ANT	459	Antigua/Barbuda	Antiguan	Antiguan	
AI	ANG	446	Anguilla	Anguillian	Anguillian	
AL	AL	070	Albania	Albanian	Albanian	
AM	ARM	077	Armenia	Armenian	Armenian	
AN	NL	478	Dutch Antilles	Dutch Antilles	Dutch	
AO	AGO	330	Angola	Angolan	Angolan	
AR	AT	890	Antarctica	Antarctica	From	

IMG Table: V_T005						
Filter: <input type="checkbox"/> Common records <input checked="" type="checkbox"/> New records <input checked="" type="checkbox"/> Changed						
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City	Veh.	Altern.country key	Name	Long name	Nationality	F. Address Routine
AD	AND	043	Andorra	Andorran	Andorran	
AE	UAE	647	Utd.Arab Emir.	United Arab Emirates	Unit.Arab Emir. From the United Arab Emirates	
AF	AFG	660	Afghanistan	Afghan	Afghan	
AG	ANT	459	Antigua/Barbuda	Antiguan	Antiguan	
AI	ANG	446	Anguilla	Anguillian	Anguillian	
AL	AL	070	Albania	Albanian	Albanian	
AM	ARM	077	Armenia	Armenian	Armenian	
AN	NL	478	Dutch Antilles	Dutch Antilles	Dutch	
AO	AGO	330	Angola	Angolan	Angolan	
AR	AT	890	Antarctica	Antarctica	From	

Figure 4. Detailed comparison between two configuration tables

Moving configuration tables. It is extremely difficult and time consuming to manually select each row in a configuration table and move it to the target system, given the large number of configuration tables and their sizes. Figure 4 shows the comparison between the configuration tables of two SAP systems, where the two systems have 3.2 million and 5.3 million different records respectively.

In general, configuration tables are updated by interacting with the SAP system, not by modifying directly the underlying tables. The Solution Workbench automates this process by enabling consultants to inspect configuration tables that were modified by the client, extract the configuration values that should be moved, automatically generate special executable files (Business Configuration Sets (BCSet)) containing those values by dragging and dropping them onto BPH business processes, and upload all changes to the target SAP system by uploading the BPH (uploading the BPH ensures that all BCSETS are executed and the configuration tables are updated with the new values). Figure 5 illustrates the simplicity of the BCSet creation

process through dragging and dropping from an IMG compare result onto a BPH.

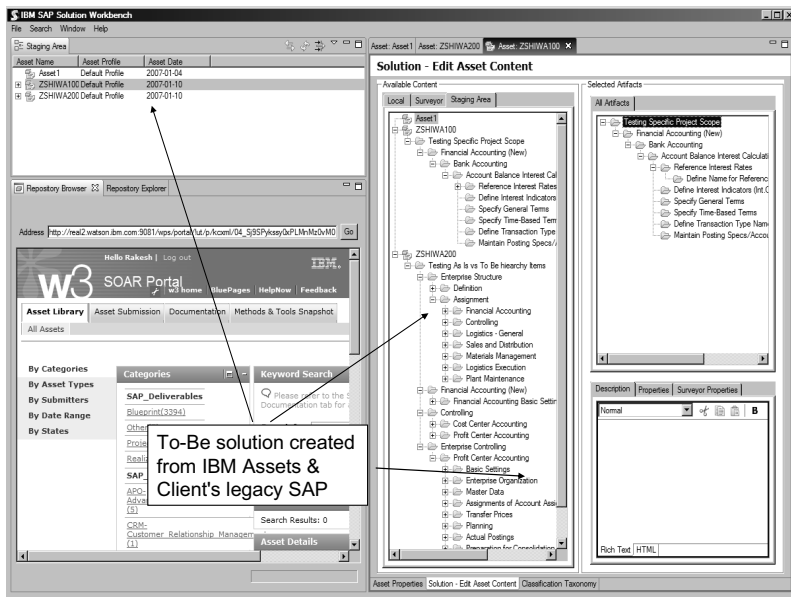


Figure 5. Content can be dragged and dropped onto the solution BPH

Moving custom code. Most clients customize an off-the-shelf SAP system before using it to run their business. Examples of customizations include changing the screens flowing while executing a business operation such as “create purchase order”, modifying the standard SAP reports, or updating the business processes to reflect the client best-practices. All customizations are done by writing ABAP programs that communicate with the SAP system through interfaces. Given that clients have tens of thousands of custom programs running on an SAP system, one of the challenges is selecting the programs to be moved to the new system. The Solution Workbench uses advanced programming language techniques to parse the ABAP code, analyze it, and determine what are the dependencies between programs. Figure 6 shows a snapshot of a dependency graph, where each node is a program and the links between programs represent several types of dependencies; a link $P_1 \rightarrow P_2$ means that (1) P_1 defines an object that calls another object defined in P_2 , (2) P_1 includes a reference to P_2 , or (3) P_1 imports P_2 . Given this dependency graph, the Solution Workbench takes any initial set of programs and automatically apply a recursive algorithm that computes the set of all programs to be moved. This ensures that the newly computed set can be moved to the new SAP system and there will not be any compilation errors of unresolved references.

6 Discussion

We now discuss how the approach works in practice and its potential for packaged applications.

6.1 Solution in Practice

During the last two years, consultants have been successfully using the tools within SAP engagements. This section describes the benefits obtained from using them.

Engagement 1. A global company, with sales offices and manufacturing plants throughout the world wanted to harmonized its financial processes. The company's US were running two SAP systems, with processes split between them. The goal of the engagement was to consolidate all processes into one system. The engagement timeline was very aggressive, with the go-live date set only 6 months away from the beginning of the engagement. First, consultants used the tools to extract all configuration tables and obtain an estimate of how much effort will be required. The team was split into two subteams. One subteam was using the compare functionality to extract all the configuration table and custom code changes by SAP areas, and the other subteam started reviewing the changes together with the client team. In this way, they were able to expedite the review process. Once the decision was taken for each change, consultants used the BCSet creation functionality to upload the changes into the new system.

Engagement 2. A global company with operations around the world, has grown through acquisition and had 6 separate SAP systems that were handling aspects of financial planning and accounting. The company wanted to standardize its operations, but was unsure which processes were configured on each system, how much customization was done and which processes were actually being run on each system. The question of which processes were configured and run on each system was addressed by building the commonality matrix. Consultants started with an industry specific business process hierarchy (BPH), and scanned each of the SAP systems to extract configuration and usage data. They then filtered the BPH using the two scans from each system. The result was 12 filtered BPHs, each of which showing usage or configuration for each system. Combining the results gave the complete commonality matrix, indicating which processes were common, and therefore good candidates for harmonization. The custom code and custom data objects were then scanned and analyzed. The results gave a measure of the degree of customization for each system, and could be used to estimate the effort required to harmonize the systems.

6.2 Solution Potential

As mentioned in the introduction, there are multiple vendors of ERP system of which SAP is the most dominant. In ERP systems, business processes is used to define the scope of the IT transformation and then the application middleware

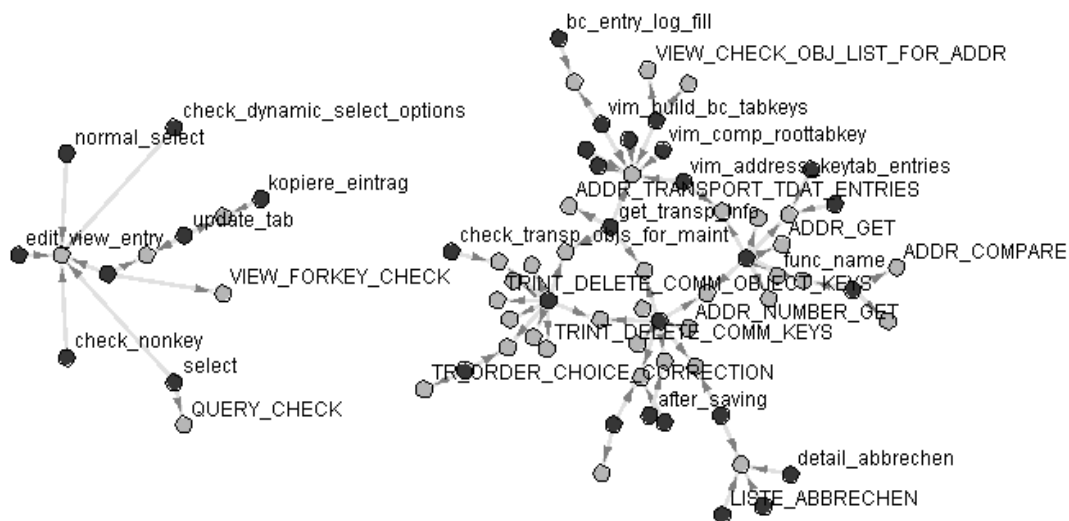


Figure 6. Dependency relationships between ABAP programs

is used to implement it. At the time of writing, SAP has the most extensive business process content and it recommends its NetWeaver platform for implementation. Oracle has a mixed collection of ERP tools from its home-grown and acquired assets including Oracle Financial, PeopleSoft and JD Edwards. It is integrating them under Oracle Fusion Applications umbrella at the business process level and as Oracle Fusion Middleware for implementation services like data integration, collaboration, identity management, messaging and application server.

Although the work presented was in the context of SAP, it is relevant to ERP space in general consisting of packaged middleware and custom-based development. Specifically, methods for “as-is” and “to-be” analysis of IT landscape and how to prepare assets and consume them in the context of the activity a user of assets is involved in, is relevant regardless of the ERP system being used. One possible future direction could be to explore the presented methods in other ERP products.

7 Related Work

Enterprise Resource Planning (ERP) systems are off-the-shelf software packages which often represent the single biggest project that an organization has ever launched or has to support. The adoption of packaged applications for ERP is a mature concept. Consider, as example, that SAP was founded in 1972 and R/3, the SAP method for representing functions in an organization using modules and client-serve architecture, was launch in 1992[8]. However, according to a recently published survey, the interest of industry (other than vendors directly implementing packaged solution) and academia research to ERP solutions has took off only in the last years [4]. In his article, Young Moon analyzes 311 ERP-related works published in various journals between January 2000 and May 2006 and proposes six major themes of research: (1) implementation, (2)using ERP, (3)extension, (4)value, (5)trends, and (6)education.

This paper should be classified under the theme implementation, which not surprisingly, is the one attracting the most research interest. This because creating an effective and efficient EPR is very tedious and require business and IT knowledge combined. Most of the research done in this area have focused on either identifying critical success factors [5] or reporting lessons learned by case studies [9, 10] which are not directly related to this work.

On the other hand, a related area of research is the one addressing assets reuse in ERP. In [7], authors presents a reuse-based requirements elicitation method for Microsoft’s Dynamics NAV while [2] discusses a formal model to quantify reuse of business requirements in different SAP projects. However, both contribution focus on business requirements which, as discussed in Section 1 are only a part of assets considered in this research. Not only, different from previous approaches, the solution discussed in this paper does not introduce assets reuse as separate but rather integrated with other tasks done as part of any SAP project. but rather integrated with other tasks done as part of any SAP project.

More recently, the ever increasing competitive pressure on reducing costs on IT investments lead organizations to rely to offshore resources when developing ERP projects. However, while the use of offshore resources has been broadly studied in software development, the right use of those in complex SAP projects is still to be determinate. The problem is not only to identify the right balance between offshore and onshore resources, but also to identify the right level of participation of offshore resources to the overall process, as in packaged application most of the work is tailored to specific business requirements. In this area, a book [1] recently published by Capgemini digs the various aspects of the problem. However, creating SAP projects with global resources is not related to this work as we address a different notion of global delivery: the need to enable the enterprise to become more globally integrated.

8 Conclusions and Future Work

This paper described a set of tools that addressed the challenges of consolidating and harmonizing SAP systems in three ways. First, it provides model-based tools to extract, analyze and compare SAP configurations and code customizations from deployed systems. Second, it provides an extensive library of process designs and other reusable assets to reduce the time and improve the quality of the “to-be” solution. Finally, it provides the ability to select, combine and directly re-use configuration elements and custom code from existing SAP implementations. These techniques have been applied on active engagements and found to be quite effective.

However, the described methods constitute only the first phase which improves the access and processing of client data and service provider’s assets so that they can be easily shared across global delivery teams. In the second phase, one can now focus on how to improve the collaboration, coordination and integration of information SAP, client and service provider’s value-added information among global teams. The current practice for consultants is to work in isolation with document templates as defined according to an established methodology (e.g. Ascendant from SAP), but for which content is manually

created or pulled from multiple sources on a per project basis. For collaboration and information access, one can use Web 2.0 technologies to provide access to information which is contextualized to the scope of the task, their role and project objectives. For coordination, one can develop a uniform, extensible, data model for SAP project related content and implement it on Jazz², a scalable, team collaboration platform. For integration of information, one can use text mining techniques to understand data content and learn relationships from different sources.

The combination of the two phases would provide a comprehensive, model-based approach and corresponding tools to address the challenges of global delivery in SAP projects. The proposed phased approach is also suitable for getting early adopters and fine-tuning the approach based on field usage.

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²<http://www.ibm.com/software/rational/jazz/>. Last accessed on 14 Nov 2008.