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Analyzing the Requirements of a Reporting Tool with Cognos BI 8

Företagsekonomi och turism
2009

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ABSTRAKT

Författare	Björn Hautamäki
Lärdomsprovets titel	Analyzing the Requirements for a Reporting Tool with Cognos BI 8
År	2009
Språk	Engelska
Sidantal	43 + 7 bilagor
Handledare	Kenneth Norrgård

Detta slutarbete är gjort åt Wärtsilä Corporation Information Management avdelningen. Huvudmålet var att utforska användningsfall och data till ett rapport verktyg for uppföljning av inköpsfakturor i SAP ERP system.

Den teoretiska delen baserar sej på boken: IBM Cognos 8 Business Intelligence, The official guide av Dan Volitich, 2008. Samt även en kort introduction till SAP

Den praktiska delen av slutarbetet är skriven i ”Description of the present situation” kapitlet. Resultatet för detta arbete är dokumenteting av användningsfall samt krav specification av data vilket tillhör användningsallen.

Ämnesord Business Intelligence, Cognos, SAP, Användningsfall, Data

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ABSTRACT

Author	Björn Hautamäki
Title	Analyzing the Requirements for a Reporting Tool with 8
Year	2009
Language	English
Pages	43 + 7 Appendices
Name of Supervisor	Kenneth Norrgård

This thesis was made for Wärtsilä Corporation Information management department. The main goal for this was to investigate data requirements and usecases for a possible reporting tool in Cognos that would report Purchase Invoices from SAP ERP system.

The theoretical study was based on IBM Cognos 8 Business Intelligence, The official guide, Dan Volitich 2008 about different aspects of Business Intelligence and also a quick introduction to SAP.

The "Description of the present situation" chapter represents the practical study for this thesis. The result wass an analyzing of use cases and the data requirements for set the use cases.

Keywords: Data Requirements, SAP, Business Intelligence, Use Cases, Cognos

Table of Contents

ABBREVIATIONS AND KEY CONCEPTS

IM	Information Management
WSSC	Wärtsilä Shared Service Centre
BI	Business Intelligence
CPM	Corporate Performance management
BPM	Business Performance management
ER-Scheme	Database entity relation scheme
SAP	Enterprise recourse planner application used globally in Wärtsilä
WESAP	Modified version of SAP to suite Wärtsilä business model
Maxflow	Modified version of Workflow configured for WESAP
Basware IP	Tool for processing of purchase invoices developed by Basware
SAP transaction	an application within SAP system
FICO Module	Finance and Control module in SAP
MM module	Materials Management module in SAP

1 Introduction

This thesis has been made for Wärtsilä Corporation, more specifically Wärtsilä Information Management, IM. Ms. Carina Nikko has been acting as my supervisor at Wärtsilä IM and also as my closest superior during my employment. Kenneth Norrgård has acted as my supervisor at Vaasa University of Applied Sciences (VAMK).

This thesis was made during the time period of 1.June 2008-1.December2009. During this time I was employed by Wärtsilä IM fulltime and later on an hourly basis since 31 August 2008 until 01 October2009

1.1 Research problem and objectives

The reason for this research is to provide Wärstilä Shared Service Center(WSSC) a report or tool for easy follow up of purchase invoices in the new SAP Workflow environment which Wärtsilä is rolling out globally. In order to provide this, it is necessary to

- Investigate functionalities and use cases
- Map the data in the SAP system database
- Document use cases for the functionalities for Wärtsilä business reporting program

It is important to note at this point that the objective in this thesis it is not to make the report/tool in question, only to provide the above data and information in order for Wärtsilä to make such a report if it is decided to do so internally by Wärtsilä.

There are several different transactions for follow up of invoices in SAP Workflow environment at the moment. Users that have previously been using IP (Basware Invoice Processing) tools for purchase invoice handling have requested to have a report or tool similar to the IP Monitor tool by Basware. IP Monitor is used as an analysis and reporting tool. IP Monitor has a diverse selection of search criteria for retrieving invoices and reports. Instead of having different SAP

transactions it would be less time consuming to have a purpose built tool or report with same functionalities as IP Monitor.

Not having this is a bottle neck for controllers during, for example, monthly closing procedures as well as end of the year closing procedures and also for vendor invoice administrators and other accountants in the account payable team when following up invoices in the SAP system on regular basis.

2 Wärtsilä Corporation

"We enhance the business of our customers by providing them with lifecycle power solutions. When creating better and environmentally compatible technologies, we focus on the marine and energy markets. We provide ship power solutions and flexible power plants with related services to our customers. Trough innovative products and services, we set out to be the most valued business partner of all our customers. This is achieved by the dedication of more than 17,000 professionals manning 160 locations in 70 countries around the world. Wärtsilä is listed on the Nordic Exchange in Helsinki, Finland." (Wartsila.com 2008)

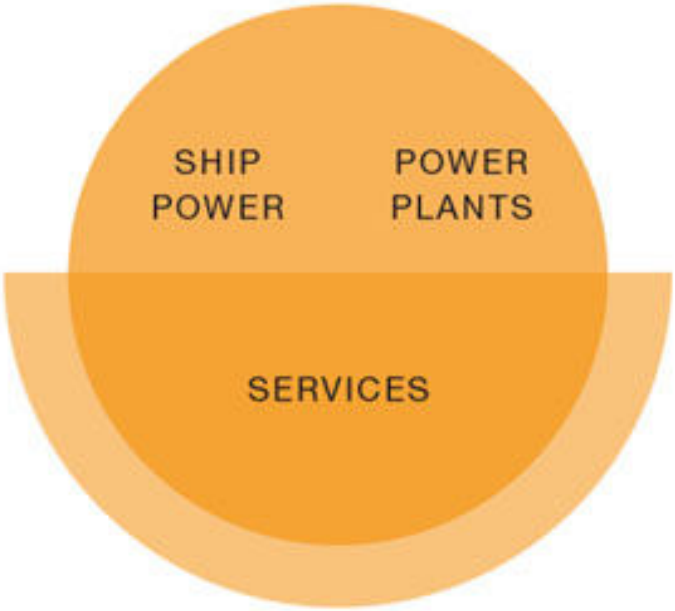

Figure 1 Wärtsilä Corporation Structure (wartsila.com 2008)

The policy of Wärtsilä is that I cannot use information other than the information published on www.wartsila.com or presentations for external use. Information from intranets can not be used. Also not any other documentation that has a lot of Wärtsilä specific information with out any approval or without omitting certain information.

2.1.1 Ship Power

"Wärtsilä is the leading provider of ship power solutions including engines, generating sets, reduction gears, propulsion equipment, automation and power distribution systems as well as sealing solutions for the marine industry. Our customer are the global or local leading companies within the merchant, offshore, cruise and ferry, navy and special vessel segments. We command a strong position in all main marine segments as a supplier of highly rated ship machinery and systems." (wartsila.com 2008)

2.1.2 Power Plants

"Wärtsilä is a leading supplier of flexible power plants for the decentralized power generation market. We offer solutions for baseload power generation, grid stability & peaking, industrial self-generation as well as for the oil and gas industry. Technology leadership, a strong and broad product portfolio, high efficiency and fuel flexibility, plus the ability to offer complete turnkey deliveries worldwide puts us in a unique position in the power plants markets."(wartsila.com 2008)

2.1.3 Service

"Wärtsilä supports its customers throughout the lifecycle of their installations by optimizing efficiency and performance. We provide the broadest portfolio and best services in the industry for both ship power and power plants. We offer expertise, proximity and responsiveness for all customers regardless of their equipment make in the most environmentally sound way." (wartsila.com 2008)

2.2 Wärtsilä IM

Wärtsilä IM – is short for Information Management which a unit within Wärtsilä Corporation that provides information management related services for the Wärtsilä Corporation globally.

Services that Wärtsilä IM provides are:

- Business Information
- Business Intelligence
- Processes
- Infrastructure
- Applications
- IM Programme and Project Management
- User Support
- Communication and Office Support Services
- Security Management

(Wärtsilä IM Presentation for external use, 2009)

3 Business Intelligence

The theoretical section of this thesis consists of different perspectives of business intelligence such as the IT perspective, and also an introduction to Cognos Business Intelligence 8.0 software main functionality and concepts. Also a short introduction to SAP and SAP workflow as the practical part will involve both software.

3.1 Performance management with Cognos BI

Performance management, business performance management, corporate performance management, business intelligence, all these terms is a way to measure and manage performance in a working organisation.

IBM Cognos 8 Business Intelligence (BI) is a technology that supports performance management by providing better visibility in business performance. In order for Cognos 8 implementation to provide maximum benefit to your organization, the organization has to understand BI to change the way in which decisions are made. The more your organization is aligned with the performance management objectives and willing to change, the more significant the impact. (Volitich 2008, 3)

3.1.1 What is performance management?

Business Performance Management (BPM) is a set of processes that helps organizations optimize their business performance. It is a framework for organizing, automating, and analyzing the business methodologies, metrics, processes, and systems that drive business performance. BPM helps businesses efficiently use their financial, human, material, and other resources. Organizations may take components of the performance management spectrum and deliver solutions specific to the business area seeking better decision-making. Performance management then can be the next generation of BI. Corporate performance management (CPM) has been defined as “a set of processes that help organizations optimize their business performance. The Cognos 8 Solution

comprises three coordinated segments of performance management. (Volitich 2008, 6)

3.1.2 Measuring and monitoring

Businesses seek the answer to "How are we doing?" Most people find the answers to this question by going to a number of different sources or tools. They pick up the phone, send e-mails, review the last presentation, and check spreadsheets. Some companies have home-grown systems or tools that are focused on the executive level. The answers get pulled together from various sources and are often manually entered into tools and results and statistics are created accordingly. (Volitich 2008, 4)

3.2.3 Reporting and analysis

Decision makers want to find answers to the question "Why?" In most organizations, this means consulting a number of reports and analysis tools to pull together a picture of why they are on or off track. Analysis tools use a variety of systems and pool data to get the answers. It sometimes requires calling on an IT department to understand elements of the puzzle, when did this happen? Was it consistent across the board or limited to a couple of regions? Was it all products or just a few? Answers to these questions, and likely many others, are found via data analysis that is used to identify trends, high or low performance, and a deeper understanding through greater insight to the data. (Volitich 2008, 4)

3.2.4 Planning, budgeting, and forecasting

Plan for the future and identify a reliable means to gather that plan across your organization. The answer to "What should we be doing?" begins with planning where you want to go. It is the process of allocating resources to achieve goals with planning, budgeting, and forecasting and includes making course corrections when changes occur to reallocate resources. Companies often do not have such plans in place. In most companies, these answers come from thousands of individually created spreadsheets. (Volitich 2008, 5)

The questions How?, What?, and Why? can be mapped to the Cognos 8 software that enables and automates answers such as scorecards and dashboards for “How are we doing?” and reports and analyses for “Why”?. The challenge with BI in many organizations is that the tools have grown up regionally and functionally, creating a patchwork of different applications and tools. The result is that, from a business user perspective, the organization ends up with different interfaces, different time periods, and even gaps in information, creating a lack of confidence in the numbers. (Volitich 2008, 5)

One critical factor is the decisions made throughout the organization from top to bottom and across functions and divisions. All those decisions are based on the information on hand, and they depend on the accuracy, timeliness, and completeness of the information. You have to identify where your organization can make the greatest benefit, and begin to plan your initial phase of the business performance journey. (Volitich 2008, 5)

As companies dig through data looking for answers, it becomes clear that they need a means to gain insight from this information. But don’t be fooled—selecting some cool technology that will yield great graphs and highly formatted reports will not necessarily solve this problem. The tools are only part of the solution. Many companies make the mistake of thinking that the tools will solve data problems when the single largest challenge is not the tools, infrastructure, or data, but actually the people. Organizations need to ask themselves the following questions:

- Do we have the people and culture that truly understand our business and who are willing to make fact-based, not gut-based, decisions? Fact-based decisions do not always “feel good.”

- Do we have the process and methodology that will take what we have learned from our BI insight and apply it to new business decisions and processes?

- Will our culture enable, embrace, and execute change?

Answers to these questions require executive input, executive direction, and a commitment to the plan for execution. More important, if the answer to the questions is "No," then save your budget, time, and do not embark on a business intelligence journey. Should that be the choice made, the company should also know that the competition is likely figuring out how to gain a competitive advantage. The competition will do this through insights to their market, customers, and profits. (Volitich 2008, 5 - 6)

3.1.5. The IT perspective of business intelligence

"From an IT perspective, implementing and maintaining a host of different tools can be inefficient and expensive. It costs money, it takes time, it requires people, and it has significant inefficiencies. Resources or report objects cannot be shared, and you need a helpdesk for every tool or class of users. Businesses often seek assistance from IT to find the answer to these problems, to make the solution easy to use, to leverage applications which are easy to maintain, and most importantly, to solve the problems. Businesses seek the "big button" that they can press to get what they want. IT gets a new project, evaluates tools, writes up the request for proposal (RFP), sends it out to vendors, and then months later claims they have done what they were asked to do." (Volitich 2008, 6)

However, the business has not adopted the solution and finds that it is still using different spreadsheets. The project is deemed successful by IT, but a failure by the business because the manual processes are still in place and the business is spending huge amounts of time trying to solve the same problems that existed prior to IT's decision for a solution. This can be avoided.

Countless experts have made statements on the value of BI in the market and how "good data" is required to make BI successful. The IT department is tasked with participation in a BI solution because the huge amount of data that the company has collected need to be organized in a manner that can be presented to the business executives. IT has been responsible in most global and small/medium business markets for gathering the operational data. IT has built sophisticated systems that enable organizations to collect information from all parts of business,

and companies have evolved from legacy systems to enterprise resource planning (ERP) to help make use of data to increase knowledge and profitability. (Volitich 2008, 6)

Because IT has been in charge of the data collection, it has usually been viewed by business as the owners of the data. And because the resources that collect the data must be knowledgeable about the organization of that data, they have built and taken ownership of the systems that house the data. While the talent and resources necessary to manage data are significant, business units are created to specialize in data. (Volitich 2008, 6)

But how does one know that the data being collected can be used to improve performance for tomorrow, next quarter, next year, or five years from now? More importantly, have insights been made into "how" data is collected so that it can be transformed into usable information by typically non-technical business users? These questions can be challenging to answer because IT often does not understand why the business cannot understand the information they have provided. (Volitich 2008, 6)

Because business intelligence (BI) solutions bring use of "information" together with business performance, we need a bridge that will give IT comfort that the information they are gathering for the business is accurate and that will provide the business with the confidence that the "information" can be used easily to make important decisions. (Volitich 2008, 6)

To use this information, IT has to be able to provide "good data." IT must use strict data planning that provides, for example, a common definition of a customer and clean delivery of that definition as defined within the business. (Volitich 2008, 6)

The following is a business case used as an example in the IBM Cognos 8 Business Intelligence, The official guide by Dan Volitich.

Business Case example:

“At a client site, we were charged with the deployment of a data warehouse for sales and market forecasting. When we pulled the data from their point-of-sale (POS) system, the data contained multiple instances of customer names, misspelled customer names, and varying opinions about whose responsibility it was to clean them up. The client knew this problem existed in their data, but a manual process of correcting the problems in a spreadsheet versus in the data source masked the insight to their business that was really needed to make informed decisions about the product mix. The lesson in such a case is to make sure a solid plan is in place so that data can be easily maintained as necessary—this will benefit the organization as a whole, and you may become an IT hero along the way.” (Volitich 2008, 7)

“It is always important to work with your business to understand the benefit of your role in the BI journey. This is not an “IT versus Business User” undertaking. If you attack it that way, the project will fail. Do not take it personally if the business requires IT to change or add a field in the database or the DBA is asked to adjust the access rights to the data.” (Volitich 2008, 8)

“Educate yourselves and ask for help from a trusted source who has embarked on this journey before, even if you partner with them for a short time. We have a saying in our organization when getting new resources up to speed: “It is always easier the tenth time.” This does not mean that it takes 10 times to get it right; it means we have potentially found ways that are clearly not right before nailing the right one” (Volitich 2008, 8)

3.1.3. The Business Intelligence perspective

“Have you ever balanced your checkbook after writing your monthly financial obligations and thought that you should adjust your budget so that you have more cushion from month to month? How do you adjust to a shortage in your checkbook? In essence, you adjust your monthly plan, knowing that if you do not, you will fall short on next month’s obligations. Businesses are the same.” (Volitich 2008, 8)

Businesses have to have a solid plan with visibility so they know where they are going and if they need to "adjust." Also, they need to have ability to see "why" the business might need to adjust. For example, a new product line might be exceeding sales expectations, now the organization may need to adjust its supply chain so that it can have adequate inventory to full fill orders. In doing so, managing cash becomes critical to such growth and so on. (Volitich 2008, 8)

"How does BI help with all of this? BI provides high-level checks and balances that allow a business to react to resolve problems or priority changes. Because IT controls the data and monitors the data integrity, they are often tasked with the selection and implementation of the data warehousing solution. Sometimes, IT departments build requirements without talking with the users and understanding their needs. For companies with healthy BI processes, BI becomes a bridge between IT and the business. Business users have visibility and insight into the technical details behind the business, and the IT engineers gain an understanding of the business drivers and issues. In addition, if users are given permission to create reports, IT's workload lessens and business users have access to what they need, when they need it." (Volitich 2008, 8)

A business intelligence solution is safe. All data extracted from a data source is organized and wrapped within a security package. The data in the data source cannot be touched, edited, or destroyed. Business users may have a lot of data to thrash through using Microsoft Excel, but where does that data come from? Usually, IT extracts the data from a database to a file format that Excel can understand. Before you know it, you might have multiple spreadsheets containing multiple versions of the same data. Who owns the correct data? In this case an automated process would be better for the user? What does the data mean? Using a business intelligence solution, you can analyze what is happening in your business.

You have heard that customer complaints are increasing. Using dashboards, you are able to see that the number of calls coming into the data centre is higher than normal. A Dashboard is a collection of different kinds of statistics which can give users and easy to understand and see an overview of different situations the

company is in at a certain moment. For example as you drill-through the dashboard, the results show that shipments have not been leaving the plant on time.

Upon further drill-through, you see that one of the largest machines in the plant has not produced your company's product for more than a week. A phone call to that department indicates that the machine is under repair. The business intelligence solution brings a level of validity to performance measurements and a basis upon which to make adjustments. This kind of statistics is hard to argue against and can give accurate numbers. They are what they are and business have to be able to adjust it self to make corrections. (Volitich 2008, 8 - 9)

4 Cognos Business reporting

4.2. Cognos User Roles

Typically, an organization's employees comprise executives, financial accounting staff, IT architects, IT developers, sales managers, part/product managers, and so on. Each employee has a specific role in a specific segment of the organization and the need to access data to support that role. Sometimes, he or she may need to view data from within and across organizational segments to make decisions, understand trends, or view performance statistics. Certain data is protected, such as financials, and only those with a need to know are granted access. (Volitich 2008, 25)

When implementing Cognos 8 application, you must keep users needs in mind. Does the user need to be able to interact with the data and modify it or is the ability to only view the data enough? Will the user review the same information month after month, or does the user need to create own reports during the month to keep track of the company's progress? Does the user need simply to view data or run reports? The answers to these questions determine how you will configure the Cognos 8 license roles in which you have invested. (Volitich 2008, 25)

These questions also help you to determine which Cognos 8 studio will be made available to the user. If a user reviews information monthly and does not need to create reports, you can assign the Recipient role, which allows the user to view reports created by another member of the organization. If the user needs to drill-through the data to create reports or scorecards, assign that user a role that provides access to one or more of Cognos 8 studios, such as Query Studio, Report Studio, or Metric Studio. (Volitich 2008, 25)

Cognos 8 user roles are grouped according to the amount of control the user should have over the application. The first grouping, *non-author roles*, allows users access to reports generated from Cognos 8 via various mechanisms such as e-mail, a portal, or direct access to a studio. The second grouping, author roles, allows users to create reports using one or more studios. Also, discussed within

author roles are the administration roles of the BI Professional and the BI Administrator. (Volitich 2008, 25 – 26)

4.3.1 Cognos Non author roles

Cognos 8 has three non-author roles that provide all users with the ability to view stored reports, and in the case of the consumer, to run reports. The three roles are the Remote Recipient, Recipient, and Consumer. (Volitich 2008, 26)

4.3.2 Remote Recipient

As a Remote Recipient, you can receive reports that have been generated by Cognos 8 and that have been released to you through various outlets (such as e-mail, wireless devices, or paper). Users can view reports without access to any Cognos software. (Volitich 2008, 26)

4.3.3 Recipient

As a Recipient, you have access to the Cognos Connection portal to select and view stored reports. Additionally, you can set the default language, time zone, and other personal preferences in Cognos Connection. You can view the same reports that Remote Recipients can, but you can view them directly on the portal. (Volitich 2008, 26)

4.3.4 Consumer

Consumers have access to the Cognos Connection portal to select and view stored reports in the same way that the Recipient does. As a Consumer, you can consume any content in Cognos Connection by running reports, responding to prompts, and scheduling reports. Additionally, you can consume report output inside the Microsoft Office environment with the IBM Cognos 8 Go! Office component. This allows you to access your business intelligence (BI) content directly from your Microsoft document. You can receive Event Studio notifications (such as status changes, updates about priority customers. Also it is possible to set

preferences and create folders in the Cognos Connection portal. (Volitich 2008, 27)

4.4.1 Cognos Connection and Cognos 8 Studios

All of the roles discussed in this chapter, with the exception of the Remote Recipient, give you access to Cognos Connection. The studios to which you have access depends on the role you have been assigned. Each role allows different access rights. Using Query Studio, Report Studio, Event Studio, Metric Studio, and Analysis Studio, you can create purpose built reports, detailed reports, and notifications based on data, and you can monitor and analyze your data. (Volitich 2008, 34)

4.4.2 Cognos Connection

Cognos Connection is the web portal by which users access Cognos 8 and the studios.Depending on the role that you have been assigned, you can use the Cognos Connection portal to retrieve, view, publish, manage, and organize your organization's reports, scorecards. The Administrator also uses the Cognos Connection portal to establish roles and user permissions and manage the Cognos Connection content. All Cognos Connection users can personalize how Cognos Connection displays for them. Users can modify personal preferences, such as the language and regional settings. They can also change the format (PDF, Excel, HTML) in which they receive content, such as queries, reports, and analyses. (Volitich 2008, 34 - 35)

4.4.3 Query Studio

Query Studio, is an easy to use authoring tool with which you can quickly create simple queries from the data stored in your database without having the skills of a professional report writer. With Querq Studio, you can view, filter, sort, and format the data; modify the query layout; and add charts. The content can be saved and shared with other people in your organization. (Volitich 2008, 35 -36)

4.4.4 Report Studio

With Report Studio, you can create and format reports easily using two authoring modes: the Professional authoring mode and the Express authoring mode. The difference between these modes lies in the functionality they provide in Report Studio. (Volitich 2008, 36)

4.4.5 Event Studio

"With Event Studio, you can establish a threshold or assign a specific event that sends a notification to the decision makers in your organization. You create agents that monitor your thresholds or event, and when the threshold is reached or event occurs, the agent sends the notification. Notifications can include an e-mail, adding information to the portal or running reports." (Volitich 2008, 37)

4.4.6 Metric Studio

With Metric Studio, you can monitor and analyze your organization's business metrics by creating a scorecarding environment. Metric Studio allows you to establish criteria and then monitor your organization to see how it is responding as the criteria changes. (Volitich 2008, 38)

4.4.7 Analysis Studio

Analysis Studio, enables business users to get fast answers to business questions so the organization can better understand product, customer, and organizational needs to react swiftly and stay ahead of the competition. Analysis Studio is best for exploring information in multiple dimensions and for deep comparative analysis. (Volitich 2008, 39)

4.4.8 Summary

In a summary, the performance management journey will require planning, corporate commitment, and technical perseverance. The most successful organizations that have deployed BI and then progressed to a strategic

performance management driven enterprise have initiated best practice deployment and clear measurement of their success.

Align business and technology objectives closely. Its good to remember that the whole organisation will benefit in a well-performing company. Insight to that performance is critical and will enable the company to make adjustments as necessary quicker, better, and faster than the competition. The internal (and external) clients depend on a proficient means to get the information they need to make sound, well-supported decisions.

5 SAP

SAP R/3 is the former name of the main enterprise resource planning software produced by SAP AG. It was renamed SAP ERP. It was later renamed Enterprise Central Component or ECC. It is an "enterprise resource planning" package, software used to organize effectively the resources (capital, human resources, machinery, etc..) of an organization. SAP R/3 is a client/server based application, utilizing a 3-tiered model. A presentation layer, or client, interfaces with the user. The application layer houses all the business-specific logic, and the database layer records and stores all the information about the system, including transactional and configuration data. SAP R/3 functionality is structured using its own proprietary language called ABAP (Advanced Business Application Programming).

ABAP, or ABAP/4 is a fourth generation language (4GL), geared towards the creation of simple, yet powerful programs. R/3 also offers a complete development environment where developers can either modify existing SAP code to modify existing functionality or develop their own functions, whether reports or complete transactional systems within the SAP framework.ABAP's main interaction with the database system is via Open SQL statements. These statements allow a developer to query, update, or delete information from the database. Advanced topics include GUI development and advanced integration with other systems. With the introduction of ABAP Objects, ABAP provides the opportunity to develop applications with object-oriented programming. (SAP Help Portal.2007)

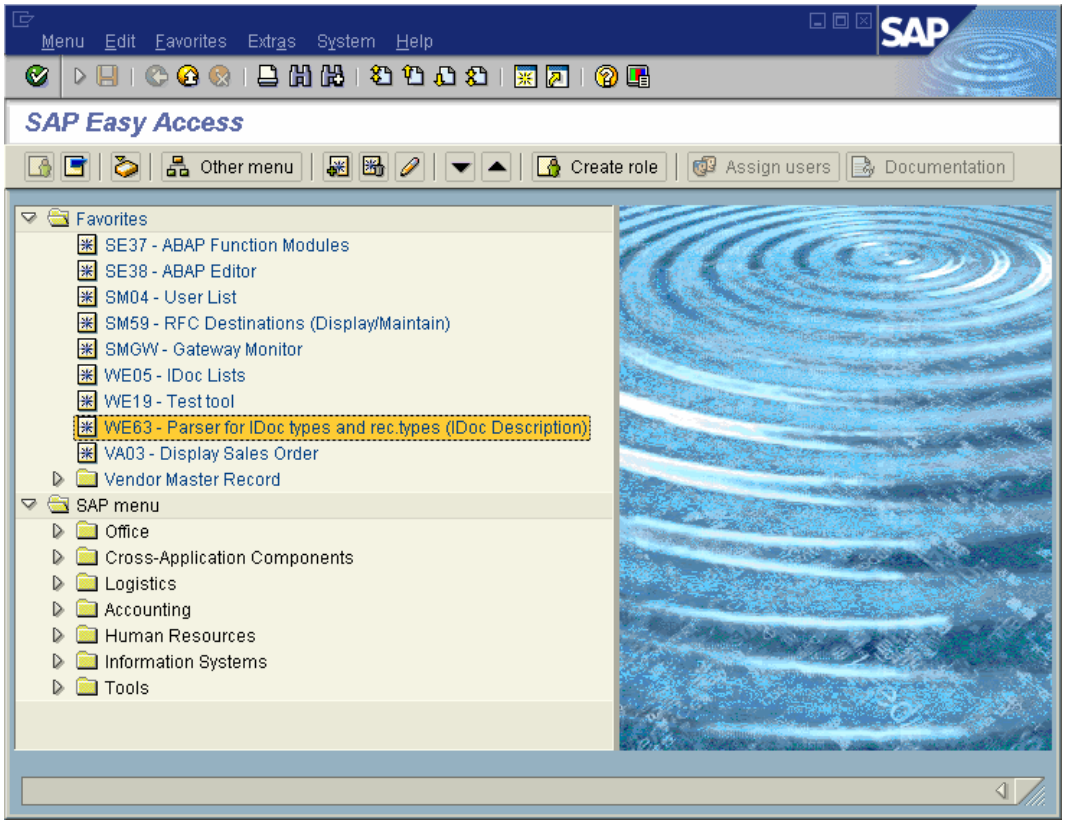

Figure 2 SAP R3 Main menu (http://developers.sun.com)

5.1. SAP Modules

In this small chapter I will give info about the SAP modules that this thesis mainly concerns. There are several more SAP modules, however not all have to be implemented for SAP to be useful in a company. Below are the most used modules listed, however there are more.

- SD module, Sales and distribution
- PS module, Project systems
- HR module, Human resources
- CO module, Control

(SAP Help Portal.2007)

5.1.1 FI module

Designed for automated management and external reporting of general ledger, accounts receivable, accounts payable and other sub-ledger accounts with a user defined chart of accounts. As entries are made relating to sales production and payments journal entries are automatically posted. This connection means that the "books" are designed to reflect the real situation. (SAP Help Portal.2007)

5.1.2 MM module

Sap MM module is short for Materials management. Materials management is used for procurement and inventory management. The module has two important master data - material and vendor. Broadly, the various levels that can be defined for a SAP MM implementation are: Client, Company Code, Plant, Storage Location and Purchase Organization. SAP MM is all about managing the materials i.e the resources of an organization. These resources include men, manpower and materials. The main functionality within MM includes purchasing, Inventory management. (SAP Help Portal.2007)

5.2. SAP workflow

SAP Workflow ensures "the right work is brought in the right sequence at the right time to the right people". It is a tool designed to facilitate and automate business processes that requires tasks to be performed by people. Ideal for casual or non-SAP users, since all the work items can be performed outside of SAP by simply responding to an email, SAP workflow can be linked to Microsoft Outlook or Lotus Notes. Each step of a business transaction can be easily monitored and processes are completed from the beginning to the end. Workflow allows process owners to keep an eye on deadlines, provides statistics on the length of time to complete work processes, determine the workload with regard to individual employees and save processing time. (Insight Consulting Partners.2001)

“The workflow definition is a set of rules that determine the path that the process takes” For example how an invoice document is processed from the initial creation until the document is completed for payment.

“The workflow instance, which is often simply refered to as the workflow, is a single workflow run. For example, the processing of a single purchase requisition for computers” The tasks are the steps in the process, which have to be performed by either people or automatically by the software. For example to check for the availability of the spare computers in a company.” (SAP Technical.2006)

“A work item is the task instance that is performed as a single workflow step for example, check that there are no spare computers available in the company” (SAP Technical.2006)

“Agents are the people who process the tasks(via the work items). “ (SAP Technical.2006)

Figure 3 below will illustrate a simple workflow process.

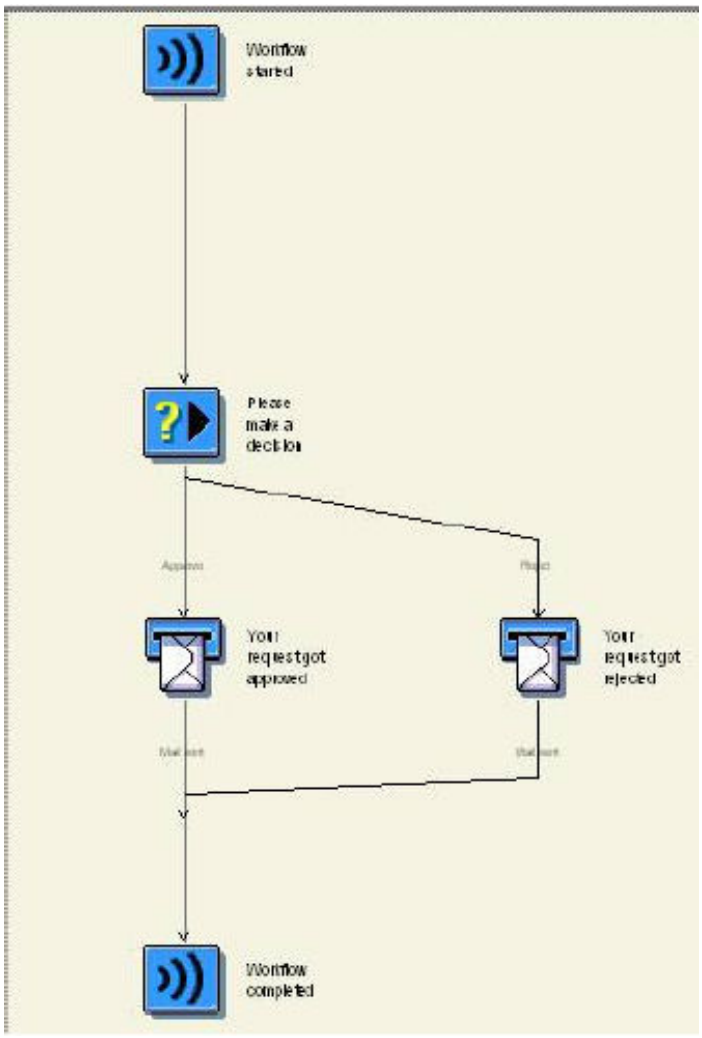

Figure 3 Sap technical.com.2008. www.scribd.com)

The above example is a simple workflow containing one decision, and approval or rejection. This workflow will in either case send end user an e-mail notification of the approval or rejection.

Although the advantages gained by using workflow are not of financial nature, the time saved by optimizing processes could easily be translated into money. - The quality of your processes will be assured by sending relevant information directly to the user. Managers don't have the time to search for information.

6 Description of the present situation

6.1 Introduction

The present situation in Wärtsilä purchase invoice handling process is that most of Wärtsilä countries have started to use SAP workflow in processing of purchase invoices in Wärtsilä. Only in OY Wärtsilä Finland AB is Basware (IP) solution in use. Companies that have previously been using IP and have now moved over to use SAP environment have stated that a similar tool or report to the IP monitor application is needed. The Monitor tool has been very useful in the following up of invoices in the IP system. IP Monitor has a very diverse search function which is mostly used. IP monitor enables you to search by almost all invoice data as search criteria. IP monitor shows also a flow log specific to each invoice, whit this user can se if other users have received the invoice during the approval process and also see comments. IP monitor has been praised for its easy to understand user interface also by users.

In the SAP Workflow environment you can also search by most invoice data, however there is at the moment no single transaction that can search by all data. This has to be done with many different transactions which is considered a bottle neck in closing periods and also in daily work for Vendor Invoice Administrators and other accountants at WCCS.

6.2 IP

Invoice Processing (IP) system consists of a group of tools developed by Basware. These are

- IP Fast Scan Client, for scanning paper invoices
- IP Master, for booking costs
- IP Client, for Approving invoices in approval flow
- Monitor, *IP* Monitor is used as an analysis and reporting tool. Monitor has a diverse selection of search criteria for retrieving invoices and reports.

The IP solution has been in use in, Wärtsilä Corporation, Wärtsilä Deutschland and in Switzerland, and is still in use in Wärtsilä Finland partly. It is to be noted that IP monitor does not allow users to make any kind of changes to invoices, it is only used for viewing and following up.

“IP was slow, but it was easy to handle compared with SAP MaxFlow.” (Klemens Kaufmann WCH Business Controll, 2008)

6.3 IP monitor tool/report functionality

IP monitor users and previous users around Wärtsilä have been interviewed by me to find out what functionalities IP monitor users mostly use. This was done in order for specifying the functionalities to the future tool for the Maxflow environment. In the interview I wanted to know

- the main usage if IP monitor
- Specific reports during different time periods
- Queries
- Statistics

6.3.1 Results

The main functionality that was pointed out during interviews with different Wärtsilä businesses was invoice search by Invoice basic data. Invoce basic data consists mostly information about the following data:

- Vendor Number
- Invoice Number
- Dates(Invoice date, entry date), Date ranges
- Cost objects (Cost center, WBS element, Order, SAP Purchase order number)
- Invoice Sum total
- Voucher Number

Data for statistic purpose to be able to se the “big picture”

- Amount of invoices in system

- Amount of invoices/Company/Business Unit/User
- Unapproved invoices
- Order related/not order related invoices

Invoice log

- Creator
- Approver
- Time, for how log invoice has been processed/user

7 Data requirements

The reporting tool that Wärtsilä Corporation uses is Cognos Business intelligence. To be able to construct the report a specification of the data requirements had to be made for the Cognos business reporting. All the data needed for the report is in the SAP internal databases of the different SAP modules, FICO module and MM module. To locate the data I have used the FICO module and MM module database ER-scheme. Together with the schemes I have searched trough the the databases with the SAP Data browser (SAP transaction SE16) and mapped the table names and fields with the required data. Some additional data tables outside of the MM and FICO module were also used such as master data tables for example vendor information.

Within the data requirements specification all fields in the report has to be mapped. As described in Use Case one the search criteria have to be mapped to SAP table and table field. Also whether they are attributes or measurements. An attribute is a value of a property such as a vendor number “1234” and a measurement is a property that is measured such as time. Also important is to specify is if the reporting fiels includes a calculation or other business logic. A good example of this is the “Due Date” field. Due date is created by the calculation Invoice date + Payment term. For the full details of the data requirements map in appendix 3 to 7

7.1 Use Cases

Within Wärtsilä, business reporting requirements should be described with use cases. What is a use case? Use case describes a business process or procedure, which is used by its business actors (people or systems) to achieve their goals. The use case will describe a process that provides value to the business actor, and it describes what the process does.

In Business Reporting projects the main target of using use cases is not to follow in detail the official use case definitions or focus on the correctness of documentation. More important is to identify that there are different use cases

related to certain information need and focus the discussion more on real business needs behind the reports.

Use case should represent one specific information need. Often one report is one use case, but not always. Sometimes there are several different use cases for the same report, if the report is used for satisfying different needs of different user groups. Typically for each use case there is only one user group. If there are several user groups, it might mean that there are several use cases. However sometimes it is valid to deal them as part of a same use case. There is no one correct answer when to create a separate use case. Use cases will be used as a base for test cases in user validation tests, so they should be used to validate whether the deliverable (report, cube etc.) full fills the business needs or not.

7.2 Use Cases, Case Wärtsilä

For this investigation I have created five different use cases that will cover the functionalities for this report. The first two use cases are very similar as they both cover the most important aspect of this report, the invoice search by basic data and cost objects or Purchase order number. More details on these are in the next heading. Use cases three and four are more for a statistical purpose. Use Case three is to get a view of the status of the invoice, for example are the invoices in parked status or posted and completed for payment. Use case four is to get a view of the total amount of invoices per Wärtsilä company or Business unit, as some of the Wärtsilä companies are also devided into smaller units. This is also covered. The final use case is to get a log of who has started the workflow and participated in the approval process. And what actions have been taken and how long all steps in he approval flow have taken. Ability to view inserted comments on work items. These is an estimated total of 500 users that would be using this report, the amount will most likely increase as the company grows.

7.3 Use Cases, 1

Use case one is very similar to use case two. These two use cases are the majority of this report as they both cover the retrieval of invoices that match specific search

criteria. Use Case one is the retrieval of FI invoices. In SAP there can be two main invoice types. Invoices with SAP Purchase Order (PO) number and invoices without Purchase order number. Invoices without PO number are the FI invoices. These FI invoices are located in the SAP finance and control module (FI/CO).

The purpose of use case one is the search of FI invoices with different search criteria. The main search criteria are invoice basic data such as:

- Customer or vendor number,
- Invoice date
- Due date
- Invoice sum total
- SAP document number
- Status

Also important are invoice line items, such as

- G/L Account (general ledger)
- WBS element
- SAP Project number
- Cost center
- Order number

The actors in these use cases are mainly Vendor Invoice Administrators, company controllers and business controllers and assistant controllers and other accountants. The frequency of the use case is estimated to be on hourly basis. (Appendix 1)

7.3.1 Data requirements Use Case 1

In the SAP FI module databases the invoice basic data is in a Header table (BKPF) within the FI module ER-scheme. The Line Item data is connected to Line Items table (BSEG or VBSGS) with the SAP FI document number.

Depending on which status the document has is the SAP workflow approval flow where the line items are located in another table within the FI module. In SAP workflow an invoice document can be in “Parked” status or “Posted”. Parked means that the document in still in the approval flow and can be modified. When a document is considered to be correct it will be completed and document status will be changed to “Posted”. Posted documents are ready for payment and cannot be deleted as such, only nullified by credit note. In this use case there are only two calculation fields. The first is Document status with two options. Parked or Posted. This has a significant impact on the data requirements as the line items are located in different tables as described earlier.

The other calculation is the due date which is calculated by adding payment term to document date. For example, invoice date is 1.1.2009 and the vendor has a payment term of 30 days. Then 1.1 + 30 days will be the due date. It would also be preferable to have a counter in the reporting tool (Cognos) to count the amount of hits for the specific search. The user number is estimated to be about 500 users. This is however difficult to predict in an global and still growing company. For details see Appendix 3 and 4

7.4 Use Cases, 2

The second use case is for retrieving MM invoices with given search criteria. The MM invoices are located in the SAP MM module. MM is shot for Materials Management. The MM invoice documents has a SAP Purchase Order number. (PO). The purpose of this Use Case is to be able to search for invoices with invoice basic data such as:

- customer or vendor number,
- Invoice date
- Due date
- Invoice sum total
- SAP PO Number

Also Purchase Order line items can be used for the search:

- PO Number
- Item details

The actors in this use cases are mainly Vendor invoice administrators, company controllers and business controllers and assistant controllers. The user number is the same as for other use cases which was estimated to about 500 persons. (Details Appendix 2)

7.4.1 Data requirements Use Case 2

In the SAP MM module databases the invoice "Basic Data" is in a Header table (RBKP) within the MM module ER-scheme. The purchase order line item data is in SAP table RSEG In MM module all information is in the same table and not in different depending on document status as in the FI module. Document status are similar to the FI module, either "Parked" or "Posted". For details see appendix 6 and 7.

7.5 Use Case, 3

Use cases three and four are for statistical purpose to get an overview of the invoice situation during for example monthly closings and other closing periods. Use Case three is more specific to get a view of the status of the invoice. i.e. are the invoices in parked status or posted and completed for payment?

Being able to view this will give a view of how many invoices are overdue or left unprocessed after quarter closing, month ends and year ends. It would also be preferable to have a counter in the reporting tool (Cognos) to count the number of hits for the specific search.

The actors in this use case are mainly Vendor invoice administrators, company controllers and business controllers and assistant controllers, the user number is the same as for other use cases which was estimated to about 500 persons. For details see appendix 1 and2.

7.5.1 Data requirements Use Case 3

The data requirements for use case three is the same as for use case one and two. Since this use case is a use case of retrieval of invoices that match certain search criteria, there are no specific data requirements demand. The most important data fields are:

- Invoice status, to determine in which status invoice is in approval flow.
- Due date. To determine id invoices are overdue
- Company code. To be able to search per Wärtsilä Company

This search has to be able function in both MM and FI module. It would also be preferable to have a counter in the reporting tool (Cognos) to count amount the of hits for the specific search. For details see appendix 3,4 and 6

7.6 Use Case, 4

Use case four is more specific to get a view of the total amount of invoices per Wärtsilä Company and also even broken down to a business unit level for companies that uses business units.

The actors in this use case are mainly Vendor invoice administrators, company controllers and business controllers and assistant controllers, the user amount is the same as for other use cases which was estimated to about 500 persons.For more details see appendix 1 and 2.

7.6.1 Data requirements Use Case 4

Use case four is also about the retrieval of invoices with specific search criteria. The data requirements are covered in use cases one and two as the search options includes company code selection which would be needed to be able to retrieve documents per company code. It would be preferable to have a counter in the reporting tool (Cognos) to count the amount of hits for the specific search in order to get a view of the invoice situation.

7.7 Use Case 5

Use Case five is to get a log of who has started the workflow and participated in the different steps that occure in he approval process of a specific invoice. Also to be able to view what actions have been taken and how long all steps in he approval flow have taken and also to learn how long the whole process has taken in total. During the approval process there is a possibility for users to insert comments to the work item. There should be an ability to view these as well.

The actors in this use case are mainly Vendor invoice administrators, company controllers and business controllers and assistant controllers. It would also be preferable to have a counter in the reporting tool (Cognos) to count the number of hits for the specific search. In the SAP workflow itself there is no built in log other than a technical log which unfortunatelly is not very useful for end users but more for the system support. However, this would still be considered as something useful in invoice processing in general. For more details see appendix 1 and 2.

7.7.1 Data requirements Use Case 5

As mentioned earlier there is no built in log for invoice documents, other than a technical log which unfortunately is not very useful for end users but more for the system support. This makes it difficult to collect the data requitements for this use case. However the data requirements which I have managed to collect so far are based upon the Workflow technical log.

The data requirements for use case five are taken from SAP table SWWWIHEAD, which is a SAP workflow table for work items. Work items are used in the SAP Workflow to execute the individual steps of a workflow as mentioned in section 3.2 of this thesis. “Work items are subdivided into work item types. Every work item type characterizes a specific type of execution of the work item and controls the internal editing processes. The type of a work item decides on the permitted status and status transitions.

In SAP workflow every document has a so called top level work item and below it are all the individual work items for the document, therefore, by knowing the document number and top level work item we can list all the work items related to specified documents. There are custom Workflow tables such as /GRZ/MFL_FRGKPF from where document number and top level work items can be found that are related to SWWWIHEAD table which contains document work items. Unfortunatelly, this will still not be enough data for a log.

Example illustration:

Document Nr

- Top level Work Item
    - Work Item
    - Work Item
    - Work Item

For more detail see appendix 5.

8 Summary

To summarize this thesis I can conclude that “Use Cases” are a good way to explain functionalities in a computer system or an application. The end users of an application dos not necessarily want to read or view any technical documentation with a lot of terms, they are more interested in the end result. Hence, use cases can be used to describe in a non technical way how the end result is achieved when the end user is integrating with the application. Weather it is a question about an complex application or a report use cases offer a good way to apply and describe functionalities.

However, even if one would want to describe functionalities in a very down to earth and non technical way, there is a need for more technical documentation for the developers of applications and other responsible persons. In this thesis the data requirements specification will serve as the technical part, which is explained in the main text and also attached to the appendix.

In this thesis the goal was to investigate use cases for a report tool and also data requirements which I was able to accomplish and I hope that if the report is implemented the documentation that this work has resulted in will be valuable.

8.1 Business Intelligence

BPM short for Business Performance Management is a set of processes that helps organizations optimize their business performance. It is a framework for organizing, automating, and analyzing the business methodologies, metrics, processes, and systems that drive business performance. CPM, short for Corporate Performance Management has been defined as “a set of processes that help organizations optimize their business performance.

Implementing the performance management is a huge journey that will require planning and a lot of corporate commitment. The most successful organizations that have deployed Business Intelligence software and then progressed to a strategic performance management driven enterprise have initiated best practice deployment and clear measurement of their success.

Its good to remember that the whole organisation will benefit in well-performing of the company. Insight to that performance is critical and will enable the company to make adjustments as necessary more quickly, better, and faster than the competition. The internal and external clients depend on proficient means of getting the information they need in order to make well supported decisions.

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Appendices

Appendix 1

Use case id	***To be filled by ... team***
Use case name	*FI Invoice search*
User groups (actors)	*Vendor invoice administrators, Company controllers, Business controllers and Assistant controllers and other key personnell in business in countries using WE-SAP*
Purpose (business description)	*Beeing able to search invoices with versatile search criterias is considered useful to be able to follow up on one or many specific invoices* *Search criterias:* *- Basic data* *- Cost objects* *- Agent/User*
Usage type	Drilldown possibility to view detailed data of selected FI invoice(document)
Usage frequency	*- Hourly*
Number of users	*300-500(still open)*
Data refresh frequency	*- Online*
Authorisation	*.As little restrictions as possibly*
Key processes	*KP.9 Logistics*

Appendix 2

Use case id	***To be filled by ....team***
Use case name	*MM Invoice search*
User groups (actors)	*Vendor invoice administrators, Company controllers, Business controllers, Assistant controllers in countries using WE-SAP*
Purpose (business description)	*Being able to search invoices with versatile search criterias is considered useful in order to be able to follow up on one or many specific invoices* *Search criterias* *Basic data* *PO Nr* *User or Agent*
Usage type	Drilldown possibility to view detailed data of selected MM invoice (document)
Usage frequency	*-Hourly*
Number of users	*300-500 (Still open)*
Data refresh frequency	*-Daily, online*
Authorisation	*As little restrictions as possible*
Key processes	*KP.9 Logistics*

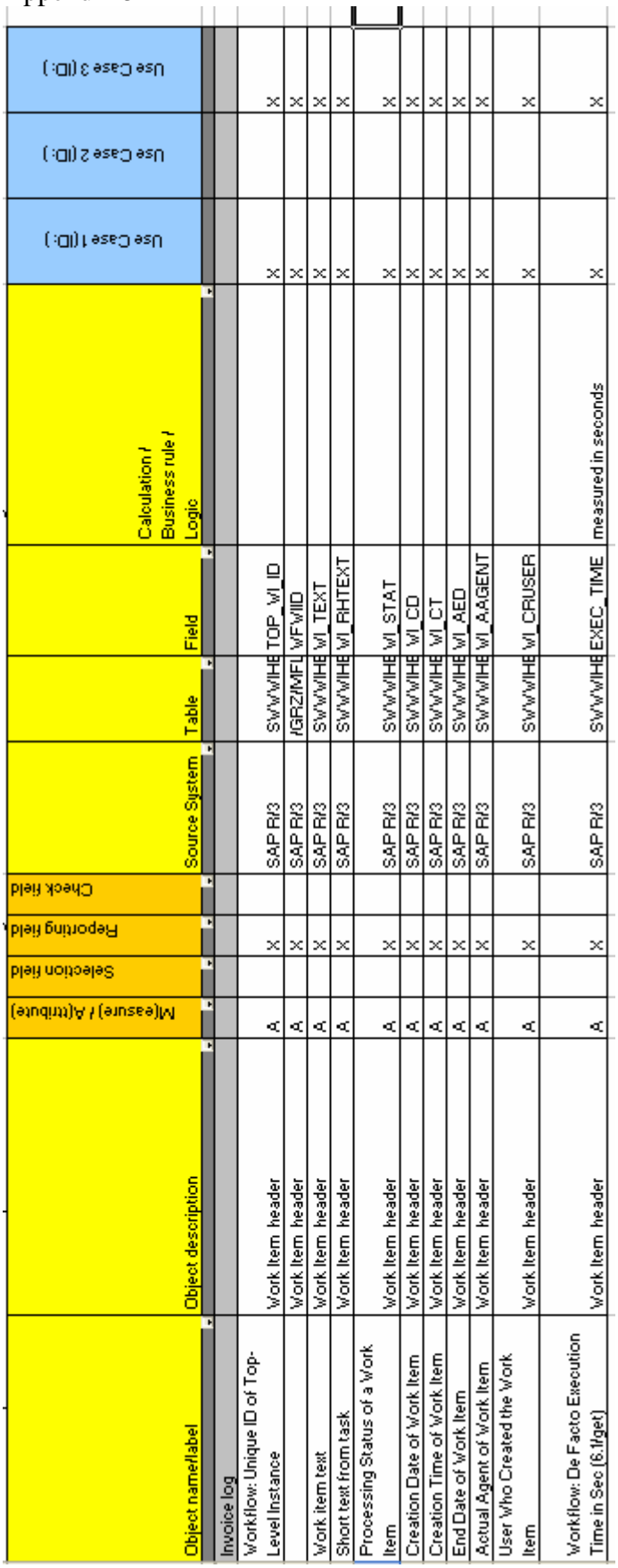
Appendix 3

Report field names and descriptions		Field usage				Data source and logic				
Object name/label	Object description	M(easure) / A(ttribute)	Selection field	Reporting field	Check field	Source System	Table	Field	Calculation / Business rule / Logic	Use Case 1 (ID:)	Use Case 2 (ID:)	Use Case 3 (ID:)	
Document status	Header data	A	X	X		SAP R/3	BKPF	BSTAT	V= parked, "" Normal. If V selected then use YBSEGS for line items Else BSEG	X			BSEG, docum
Companycode	Header data	A	X	X		SAP R/3	BKPF	BUKRS		X			
Accounting document number	Header data	A	X	X		SAP R/3	BKPF	BELNR		X			
Fiscal year	Header data	A	X	X		SAP R/3	BKPF	GJAHR		X			
Document type	Header data	A	X	X		SAP R/3	BKPF	BLART		X			
Document date in document	Header data	A	X	X		SAP R/3	BKPF	BLDAT		X			
Posting date in the document	Header data	A	X	X		SAP R/3	BKPF	BUDAT		X			
Translation date	Header data	A	X	X		SAP R/3	BKPF	WWERT		X			
Reference document number	Header data	A	X	X		SAP R/3	BKPF	XBLNR		X			
Document header text	Header data	A		X		SAP R/3	BKPF	BKTXT		X			
Currency key	Header data	A	X	X		SAP R/3	BKPF	WAERS		X			
Exchange rate	Header data	A		X		SAP R/3	BKPF	KURSF		X			
Account Number of Vendor or Creditor	Header data	A	X	X		SAP/R3	LFA1#/GRZM/MFL_FRGKPF	LIFNR		X			
Archive link	Archive Link	A		X		SAP/R3	/GRZ/MFL_FRGKPF	ARCID	Archive link to easy archive	X			Payme
Vendor group		A		X		SAP/R3	LFA1			X			
Vendor Name	Header data	A		X		SAP/R3	LFA1	Name1		X			
Due date	header data	M	X	X		SAP+			Docdate Doc date + payment term	X			Payme
Bank account	Header data	A		X		SAP/R3	LFB1	ZTERM	Payment term varies from company code to companycode	X			
	Header data	A		X		SAP/R3	LFBK	BANKN		X			
Line Item Data				X		SAP/R3				X			

Appendix 4

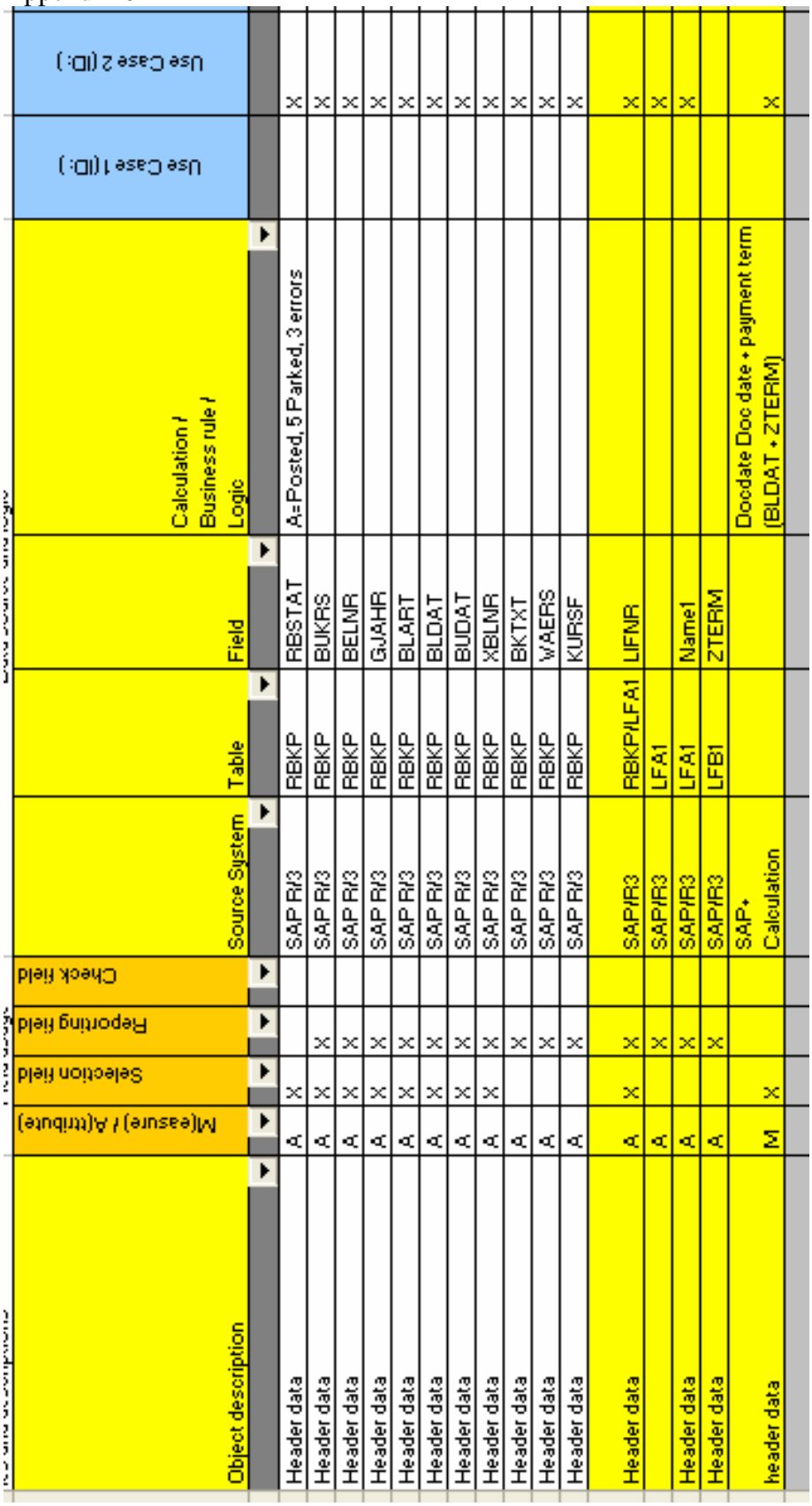
1			M	X	X	X					X
2			A								
3	Report field names and descriptions		Field usage				Data source and logic				
4	Object name/label	Object description	M(easure) / A(ttribute)	Selection field	Reporting field	Check field	Source System	Table	Field	Calculation / Business rule / Logic	Use Case 1 (ID:)
5											
26	Line Item Data				X		SAP/R3				X
27	Fixed asset / Asset main number	Line items	A		X		SAP R/3	BSEG/VBS	ANL1N		X
28	Account number of vendor or creditor	Line items	A		X		SAP R/3	BSEG/VBS	LIFNR		X
29	Amount in local currency	Line items	A	X	X		SAP R/3	BSEG/VBS	DMBTR		X
30	Amount in document currency	Line items	A	X	X		SAP R/3	BSEG/VBS	WRBTR		X
31	Tax on sales/purchases code	Line items	A	X	X		SAP R/3	BSEG/VBS	MWSKZ		X
32	Business area	Line items	A	X	X		SAP R/3	BSEG/VBS	GSBER		X
33	Value date	Line items	A		X		SAP R/3	BSEG/VBS	VALUT		X
34	Cost center	Line items	A	X	X		SAP R/3	BSEG/VBS	KOSTL		X
35	Order number	Line items	A	X	X		SAP R/3	BSEG/VBS	AUFNR		X
36	Personnel Number	Line items	A	X	X		SAP R/3	BSEG/VBS	PERNR		X
37	Quantity	Line items	A		X		SAP R/3	BSEG/VBS	MENGE		X
38	Unit of entry	Line items	A		X		SAP R/3	BSEG/VBS	ERFME		X
39	Profit center	Line items	A	X	X		SAP R/3	BSEG/VBS	PRCTR		X
40	Work breakdown structure eleme	Line items	A	X	X		SAP R/3	BSEG/VBS	PROJK		X
41	Activity type	Line items	A	X	X		SAP R/3	BSEG/VBS	LSTAR		X
42	Profitability segment number (CC	Line items	A		X		SAP R/3	BSEG/VBS	PAOBJNR		X
43	Payment Reference	Line items	A		X		SAP R/3	BSEG/VBS	KIDNO		X
44	Terms of payment key	Line items	A		X		SAP R/3	BSEG/VBS	ZTERM		X
45	General ledger	Line items	A		X		SAP R/3	BSEG/VBS	SAKNR		X
46											

Appendix 5



Object name/label	Object description	M(easure) / A(ttribute)	Selection field	Reporting field	Check field	Source System	Table	Field	Calculation / Business rule / Logic	Use Case 1 (ID:)	Use Case 2 (ID:)	Use Case 3 (ID:)
Invoice log												
Workflow: Unique ID of Top-Level Instance	Work Item header	A		X		SAP R/3	SWWWIHE	TOP_WI_ID		X		X
	Work Item header	A		X		SAP R/3	/GRZ/MFL	WFWID		X		X
Work item text	Work Item header	A		X		SAP R/3	SWWWIHE	WI_TEXT		X		X
Short text from task	Work Item header	A		X		SAP R/3	SWWWIHE	WI_RHTEXT		X		X
Processing Status of a Work Item	Work Item header	A		X		SAP R/3	SWWWIHE	WI_STAT		X		X
Creation Date of Work Item	Work Item header	A		X		SAP R/3	SWWWIHE	WI_CD		X		X
Creation Time of Work Item	Work Item header	A		X		SAP R/3	SWWWIHE	WI_CT		X		X
End Date of Work Item	Work Item header	A		X		SAP R/3	SWWWIHE	WI_AED		X		X
Actual Agent of Work Item	Work Item header	A		X		SAP R/3	SWWWIHE	WI_AAGENT		X		X
User Who Created the Work Item	Work Item header	A		X		SAP R/3	SWWWIHE	WI_CRUSER		X		X
Workflow: De Facto Execution Time in Sec (6.Hget)	Work Item header	A		X		SAP R/3	SWWWIHE	EXEC_TIME	measured in seconds	X		X

Appendix 6



Object description	M(easure) / A(ttribute)	Selection field	Reporting field	Check field	Source System	Table	Field	Calculation / Business rule / Logic	Use Case 1 (ID:)	Use Case 2 (ID:)
Header data	A	X			SAP R/3	RBKP	RBSTAT	A=Posted, 5 Parked, 3 errors		X
Header data	A	X	X		SAP R/3	RBKP	BUKRS			X
Header data	A	X	X		SAP R/3	RBKP	BELNR			X
Header data	A	X	X		SAP R/3	RBKP	GJAHR			X
Header data	A	X	X		SAP R/3	RBKP	BLART			X
Header data	A	X	X		SAP R/3	RBKP	BLDAT			X
Header data	A	X	X		SAP R/3	RBKP	BUDAT			X
Header data	A	X	X		SAP R/3	RBKP	XBLNR			X
Header data	A		X		SAP R/3	RBKP	BKTXT			X
Header data	A		X		SAP R/3	RBKP	WAERS			X
Header data	A		X		SAP R/3	RBKP	KURSF			X
Header data	A	X	X		SAP/R3	RBKP/LFA1	LIFNR		X	
	A		X		SAP/R3	LFA1			X	
Header data	A		X		SAP/R3	LFA1	Name1		X	
Header data	A		X		SAP/R3	LFB1	ZTERM			
header data	M	X			SAP+ Calculation			Docdate Doc date + payment term (BLDAT + ZTERM)	X	

Appendix 7

Object description	M(easure) / A(ttribute)	Selection field	Reporting field	Check field	Source System	Table	Field	Calculation / Business rule / Logic	Use Case 1 (ID:)	Use Case 2 (ID:)
PO Line item data	A	X	X		SAP R/3	RSEG	EBELN			X
PO line item data	A		X		SAP R/3	RSEG	EBELP			X
PO Line item data	A		X		SAP R/3	RSEG	ZEKKN			X
PO line item data	A		X		SAP R/3	RSEG	MATNR			X
PO line item data	A		X		SAP R/3	RSEG	BWKEY			X
PO line item data	A		X		SAP R/3	RSEG	BUKRS			X
PO line item data	A		X		SAP R/3	RSEG	WERKS			X
PO line item data	A		X		SAP R/3	RSEG	WRBTR			X
PO line item data	A		X		SAP R/3	RSEG	SHKZG			X
PO line item data	A		X		SAP R/3	RSEG	MWSKZ			X
PO line item data	A		X		SAP R/3	RSEG	TXJCD			X
PO line item data	A		X		SAP R/3	RSEG	MENGE			X
PO line item data	A		X		SAP R/3	RSEG	BSTME			X
PO line item data	A		X		SAP R/3	RSEG	BPMNG			X
PO line item data	A		X		SAP R/3	RSEG	BPRME			X
PO line item data	A		X		SAP R/3	RSEG	LBKUM			X
PO line item data	A		X		SAP R/3	RSEG	VRKUM			X