

SAP Final Report
SAP Business Application part 2

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Customer Relationship Management (CRM) is used for storing information on current and prospective customers and information in the system can be accessed and entered by employees in different departments. CRM technology helps companies to manage customer data and it consists of software and analytical tools that integrate customer information from all sources and analyzes it. Unfortunately many CRM projects can overrun cost and time lines.

SAP CRM is one of SAP ERP modules and it has high quality front-office functionalities which complete industry-specific processes. With SAP CRM it is possible proactively and effectively plan, prospect, manage, collaborate, close, fulfil and analyse the sales cycle and process.

Business information is used for example to optimize processes and to react quickly in the markets. Data warehouse is a repository for organization's electronically stored data. Data warehouse architecture consists of three different layers which are conceptual layer, logical layer and physical layer. With Business Intelligence tools it is possible to manage and analyze and present data from different databases, applications and other repositories very efficiently. Many BI applications can for example be incompatible with each other, lack common standards, are difficult to use and consume a lot of IT resources.

SAP NetWeaver Business Intelligence (SAP NetWeaver BI) is a solution which offers a wide set of tools, planning and simulation capabilities and data warehousing functionality. All the relevant information from SAP applications and all external data can be integrated, transformed and consolidated with the tools provided.

BusinessObjects is a software that works as a repository for Business Information content and reports and it is suitable for broadcasting and publishing of reports. BusinessObjects offers for example possibility to create interactive visualizations and to connect to SAP NetWeaver BI by using mobile phone.

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Appendix 1: Process Overview of CRM, ECC and BW/BI Business Case

Appendix 2: MultiCube Data Flow

1 Introduction

SAP AG is the largest European software enterprise and the fourth largest in the world with its headquarters in Walldorf, Germany. SAP was founded in the year 1972 as Systems Applications and Products in Data Processing by five former IBM engineers and SAP offers more than 25 industry solution portfolios for large enterprises and more than 550 micro-vertical solutions for midsize companies and small businesses. (Wikipedia 2008a.)

SAP CRM, ECC and BW are the components to share need information.eg: exchanges data as defined as the common or exchangeable. As a example, the customer contract is created into the CRM system, the contract leads to the sales order in CRM, sales order immediately accessible in ECC, where's the operative part is run. When sales order is completed in the ECC and the delivery is created. The picking and post goods issue activities executed, finally the invoice can be created base to delivery, all of these activities in the CRM or ECC systems are related to reporting BW, the executor also can check during the business case execution. (Wikipedia 2008a.)

SAP ERP Central Component (ECC): is software with which the company can run the operative function of all the core business area, from material management, sales and distribution, production planning to human resource, even financial department. (Wikipedia 2008a.)

SAP Customer Relationship Management (CRM): helps companies acquire and retain customers, gain deep marketing and customer insight, and align organization on customer-focused strategies. (Wikipedia 2008a.)

SAP Business Warehouse (BW) or SAP Business Intelligence (BI): represents the integration, transformation, consolidation, cleanup and storage of data. It provides flexible reporting and analysis tools to support the business in evaluating and interpreting data, as well as facilitating its distribution. (Wikipedia 2008a.)

2 CRM (Customer Relationship Management)

Customer Relationship Management (CRM) means the overall process of building and maintaining profitable customer relationships by delivering first-rate customer value and satisfaction. It's not just a technology; it's a strategy that deals with every aspect of acquiring, keeping and crowing customers. (Armstrong & Kotler 2005, 16.)

CRM is used for storing information on current and prospective customers and Information in the system can be accessed and entered by employees in different departments such as sales, marketing, customer service, training, professional development, performance management, human resource development and compensation. (Wikipedia 2008b.)

The underlying principle behind this approach is to improve services provided directly to customers and to use the information in the system for target marketing and sales. While the term is generally used to refer to a software-based approach of handling customer relationships as many CRM software vendors stress a holistic approach to a successful CRM strategy. (Wikipedia 2008b.)

2.1 CRM Process

There are many different approaches to CRM processes. Different CRM software's also concentrate on specific aspects of CRM. One of the main approaches is operational CRM, which supports front office business processes like sales and marketing. Operational CRM uses different kinds of tools like call center, e-mail and web pages to have contact with the customer. Interactions with customer are stored into customer's contact history within the CRM software. (Wikipedia 2008b.)

Analyzing individual customer data is a great challenge for companies thus Customer data is collected for example from customer purchases, sales force contacts, Web site visits and market research studies. The main problem is that the information is usually scattered all over the organization as it may be located in different databases, plans and records of different functions and departments. CRM technology helps companies to manage customer data and consists of software and analytical tools that integrate customer information from all sources and analyzes it. (Armstrong & Kotler 2005, 128.)

2.2 CRM Benefits

CRM analysis helps companies to assess the value of individual customers, identify the best targets and to customize the company's products and interactions to each customer. This will lead to increased sales by better timing and better understanding of customer needs. CRM makes possible to cross-sell other products by highlighting and suggesting alternatives or enhancements. It is also possible to identify profitable customers. CRM makes possible effective targeted marketing communications, which are aimed specifically at customer needs. Consequently CRM helps to understand customers better and increases company's overall efficiency and reduces total costs of sales. Companies can provide higher quality customer service and develop deeper customer relationships. (Armstrong & Kotler 2005, 129; Business Link 2008.)

2.3 CRM Challenges

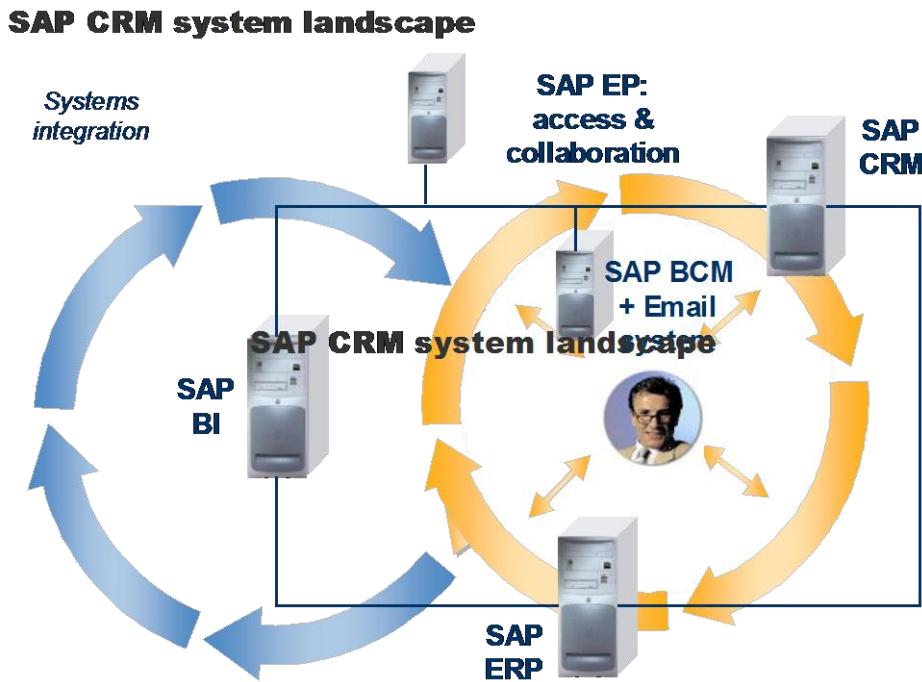
More than half of the CRM efforts fail to meet their objectives. One of the challenges with CRM is the investments which are needed to implement CRM solutions. Many CRM projects can overrun cost and timelines. It is also expensive to maintain customer data. CRM implementation projects should also involve people from different departments of the company, not just the IT team. That's how implementation is done from a wider point of view. Implementations should have also a clear objective how to achieve the goals of CRM. CRM implementation is also a cultural change for the company. That's why the implementations should be planned carefully and executed in phases. It's also important to understand that CRM is not just a software, it's also a business philosophy and strategy which is implemented by a software. (Armstrong & Kotler 2005, 129; CRM Next 2008.)

2.4 SAP CRM

SAP CRM is one of SAP ERP modules and it is used in more than 25 industries across the world and it has made the most of its associations with customers as organizations have capitalized on customers insight, improved line efficiency and effectiveness, streamline critical business processes across customer touch points and easily adapt to changing business and customer needs. By supporting customers facing business processes across multiple interaction channels SAP CRM enables organizations to focus on strategies for customer driven growth and to differentiate themselves in the market by providing a superior customer experience which makes it easier to use and understand. (SAP 2008a.)

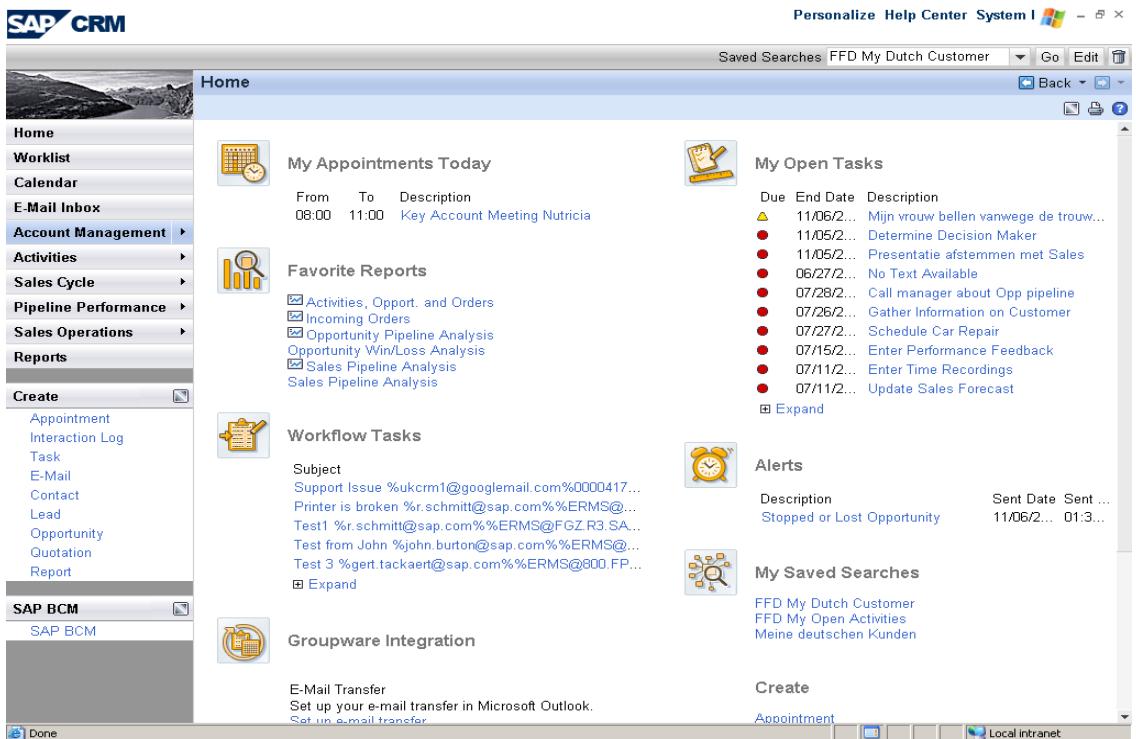
2.4.1 SAP CRM Architecture And Functions

SAP CRM is built on the SAP NetWeaver platform. SAP CRM's interface uses portal and Web technology of SAP NetWeaver services. It supports many technical interaction channels to communicate directly with customers and partners. The channels include: Internet, mobile devices and Interaction Center. SAP CRM is an open solution that offers integration for example with SAP ERP, SAP SCM and SAP BI (Picture 1). (SAP 2008a.)



Picture 1. The above picture shows the overall SAP CRM landscape.

SAP CRM has high quality front-office functionalities which complete industry-specific processes. It has a flexible delivery model which offers the right solution for specific situations. SAP CRM offers quick adaption and productivity with its Web-based interface which is easy to personalize (Picture 2). (Juha Jouppi 2008.)



Picture 2. The above picture shows a typical SAP CRM screen in its latest program version.

With SAP CRM it is possible proactively and effectively plan, prospect, manage, collaborate, close, fulfil and analyse the sales cycle and process, e.g. account and contact management, contract management, quotation and order management, sales analytics; telesales interaction centre, agents can process orders or gather pertinent information to better prioritise opportunities. E.g. Web Chat, Email Response, Voice-call back, and Call list; channel sales, more efficiently sell more products, gives the customers the same knowledge, tools and expert advices. E-selling capabilities in SAP CRM enable the complete sales process to run on the Internet: e.g. shopping basket management, web auction, collaborative selling, interactive selling and configuration. SAP CRM can also be synchronized with Microsoft Outlook calendar so that the user has always up-to-date information about the tasks. (Wikipedia 2008b.)

3 Business Information Management (BW/BI)

Companies make their strategic decisions based on business data. This information is used for example to optimize processes and to react quickly in the markets. Timely access to relevant information is a critical factor to achieve business success. Nowadays ERP-systems (Enterprise Resource Planning) play a major role in company's business processes. ERP enables sharing coordinated and integrated data through single applications across multiple business functions. ERP provides system integration and a unified and standardized way of

gathering, managing, processing and sharing consistent, real-time information and documenting events amongst all parties connected to the system. Companies may have even tens of terabytes of data which has to be sorted. That's why efficient and correct interpretation and integration of the business data plays a key role for the company's decision making. There are many kinds of applications in the markets which offer solutions to manage and analyze business data for example Linux, Microsoft Navigation, Oracle and SAP. (SAP 2008b)

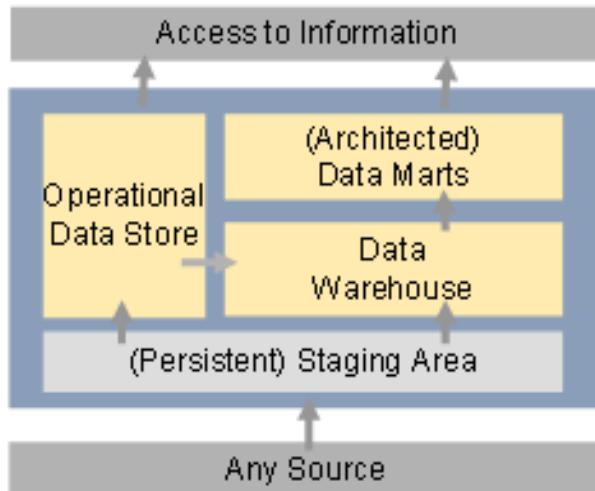
The information is usually stored in many different locations. Structured information is usually located in different databases, applications and other repositories. There is also a lot of unstructured information which resides for example in e-mails, hard disk files and Web sites which are important information sources for basically any company. A lot of data is also recombined and saved again, so that the quantity of information doubles all the time. It can be a very challenging task to integrate structured and unstructured data and to work with dispersed data. This issue is critical because nowadays there is also a number of new data collection technologies in companies, such as RFID (Radio Frequency Identification), which makes efficient access to relevant information even more challenging. That's why it may require vast amounts of resources from the company to handle this kind of data. (SAP 2008b.)

In the past years data warehouses have become one of the most important components of modern decision-support systems. Data warehouse is a repository for organization's electronically stored data. A broader definition of data warehousing also includes business intelligence tools that are applications designed to report, analyze and present data that is usually loaded from data warehouses. Consequently the main purpose of data warehouse is to facilitate reporting and analysis. (Wikipedia 2008d.)

3.1 Architecture

Data warehouse architecture consists of three different layers which are conceptual layer, logical layer and physical layer. The conceptual layer defines the vision, goals and strategy of the data warehouse which must be consistent with the company's vision, goals and strategy. The logical layer defines the scope of the system and solution and the required infrastructure. Application models and a detailed, logical data model are also created in the logical layer. The logical layer can be subdivided into three different layers which are data acquisition layer, data storage layer and data presentation layer. The data acquisition layer contains tools which extract data from operational sources, format data and load it into the data warehouse (Picture 3). The data storage layer has special indexing procedures and it minimizes the access times.

Data presentation layer consist of data marts which provide structures for end-user applications and presentation tools. The physical layer defines the technical implementation of the data warehouse infrastructure, the software and data communication. This layer also creates the physical data model, detailed process and application and program definitions. (Fiechter, Norbert & Rohlf 2005, 35-37.)



Picture 3. The above picture shows a simplified architecture of a data warehouse solution.

3.2 BW/BI Benefits

One of the main benefits of BW or BI is that it provides a common data model for all data of interest in spite of the data's source. It is possible to have single version of the truth" which is a comprehensive conclusion based on all pertinent inputs and the ability to link operational realities with company's strategic goals. Before loading data into the data warehouse, all inconsistencies are also solved which simplifies reporting and analysis greatly. The right information is also available at the right time. With efficient business information management it is possible to achieve fast return on investments. (Saila Huurinainen 2008; SAP 2008b.)

3.3 BW/BI Challenges

There are many different kind of applications in the markets which offer useful tools to manage business data. There can be for instance a business intelligence tool for cost controlling and a performance management utility for business leaders. Unfortunately many of these applications can be incompatible with each other, lack common standards, are difficult to use and consume a lot of IT resources. Upgrades can also be a major challenge when

updated components won't work with linked components correctly. There's also a risk that data models can get out of sync with business models. There may also be a disconnect between business and IT which can lead to misunderstandings and long development cycles. The use and quality of information can also be driven by departmental goals and skills of individual contributors. That's why the relevant inputs and links between operational realities and strategic goals may not be considered and the information isn't reliable anymore. (SAP 2008b.)

3.4 SAP Net Weaver BI (SAP BW)

SAP offers many solutions which make company's business information management more efficient. Components like SAP NetWeaver Business Intelligence (SAP NetWeaver BI), SAP Net Weaver Exchange Infrastructure, SAP Net Weaver Master Data Management and SAPNetWeaver Portal component's knowledge management functionality help companies to organize and integrate structured and unstructured data and give quality information which enhances company's decision making. (SAP2008b.)

As a core component of SAP NetWeaver, SAP BI provides data warehousing functionality, a business intelligence platform, and a suite of business intelligence tools that enable businesses to attain these goals. Relevant business information from productive SAP applications and all external data sources can be integrated, transformed, and consolidated in SAP as it provides flexible reporting and analysis tools to support the evaluating and interpreting of data, as well as facilitating its distribution. (Saila Huurinainen 2008.)

How a company can analysis or develop its business operations by using SAP business information system. Then it should prepare or configure its basic Information (SAP BW) information model. Which is based on the core building block of Info Objects which are used to describe business processes and information requirements, they provide basis for setting up complex information models in multiple languages, currencies, units of measure, hierarchy, etc. It allows exchange of data and metadata with other systems and tools in the case of SAP-specific interfaces like Staging BAPI and the OLAP BAPI and supports other industry standard interfaces allowing easy access to data and metadata maintained in SAP. The key elements in the Sap's BW information model are: Data Sources, Info Sources, ODS Objects, Info Cubes, Info Providers, MultiProviders. (SAP2008b.)

Data Sources

Data Sources are flat data structures containing data that logically belongs together. They are responsible for extracting and staging data from various source systems. (SAP2008b.)

Info Sources

Info Sources are the group of Info Objects that belong together from a business point of view. It contains the transactional data obtained from the transactions in online transactional processes (OLTP) and master data such as addresses of customers and organizations, which remain unchanged for longer time period. (SAP2008b.)

ODS objects

An ODS object is a dataset which is formed as a result of merging data from one or more info sources. In it information is stored in the form of flat, transparent database tables that are used for preparing reports and quality assurance purposes. (SAP2008b.)

Info Cubes

Info Cubes are multidimensional data storage containers for reporting and analysis of data. They consist of keys figures and characteristics of which latter is organized as dimensions facilitating users to analyze data from various business perspectives such as geographical area or types of sales channel. (SAP2008b.)

Info Providers

Info Providers refer to all the data objects that are present in the SAP BW systems. These include all the data targets viz. Info Cubes, ODS objects and master data tables along with Info sets, remote Info cubes and Multi Providers. (SAP2008b.)

Multi Providers

Multi Provider is a virtual information provider which is a combination of any two physical or virtual info providers. Multi Providers do not contain any data and are used to combine data from different info providers. Their main purpose is to make this data accessible for reports and analysis. (SAP2008b.)

Business Intelligence

Business Intelligence capabilities in SAP Net Weaver provide tools for defining and maintaining the data warehousing platform and tools for end-user interaction with BI data. The core capabilities of BI together are to measure it, to give access to its customer and to share the changed information. The changed information can be further integrated in three parts:

1. Enterprise performance management
2. Information Delivery
3. Information management (SAP2008b.)

3.4.1 Information Extraction

SAP BI allows end users usually business managers to easily obtain or view information even though it is stored on different enterprise systems. This is possible as BI technology allows users to integrate transform and consolidate information with the help of business intelligence platform suites.

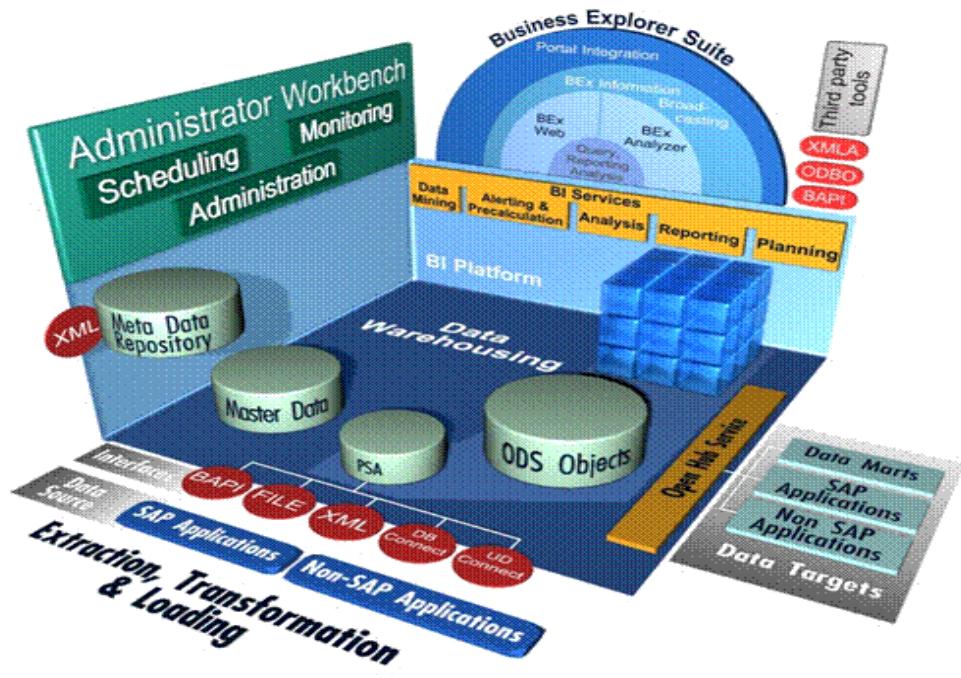
Businesses are able to make well-founded decisions and determine target-orientated activities on the basis of this analysis. One of the commonest methods of extracting data from the database is known as data mining, it is the analytical approach that looks for hidden data patterns in large databases and provides insights by analyzing past data to predict future trends and behaviors, for instance the collecting of information of the demographics of the members through the membership applications, products they've purchased or seminars attended through a registration database i.e. analyzing information an organization already has. (Saila Huurinainen 2008.)

3.4.2 Integration with Other SAP NetWeaver Components

BEx Information Broadcasting allows users to publish pre-calculated documents or Online links containing Business Intelligence content to SAP Enterprise Portal (SAP EP). End users are able to integrate contents from SAP BW in SAP EP using the BEx Broadcaster, the BEx Web Application Designer, the BEx Query Designer, KM Content, the SAP Role Upload or the Portal Content Studio (Picture 4). The documents and metadata created in SAP BW (metadata documentation in particular) can be integrated using the repository manager in

Knowledge Management in SAP Enterprise Portal. The BW Metadata Repository Manager is used within BEx Information Broadcasting. (SAP 2008b.)

Users can send data from SAP and non-SAP sources to SAP BW using SAP Exchange Infrastructure (SAP XI) as data is placed in the delta queue where it is available for further integration and consolidation. Data transfer using SAP XI is (Simple Object Access Protocol) SOAP-based. (SAP 2008b.)



Picture 4. This picture shows how subareas and their functions are integrated into the SAP BW architecture

3.5 BusinessObjects

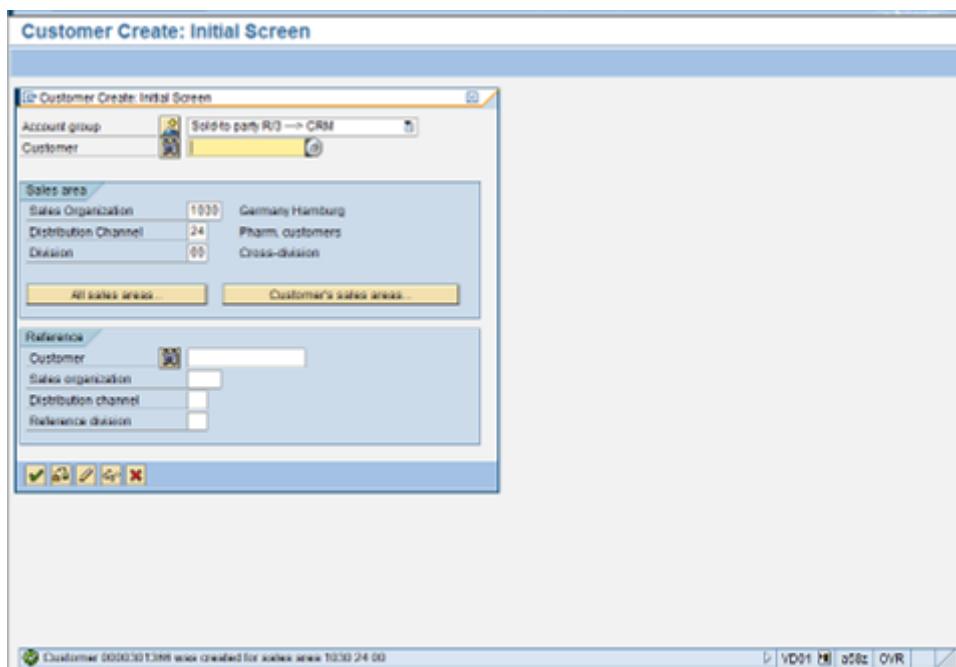
Company's business information can be viewed and analyzed in multiple ways. BusinessObjects platform is owned by SAP and it can be integrated with SAP NetWeaver. It works as a repository for Business Information content and reports and it is suitable for broadcasting and publishing of reports. BusinessObjects offers for example possibility to create interactive visualizations with Xcelsius environment. These kind of flash-based dashboards simplify business information and make it easier to analyze data. With Live Office it is possible to add and reformat business information reports and dashboards in Microsoft Office programs like PowerPoint, Word and Excel. BusinessObjects has also BI Widgets which can have access to up-to-date business information straight from the computer's

desktop. With BI Mobile it is possible to connect to SAP NetWeaver BI by using mobile phone. This solution shortens sales cycles and increases customer satisfaction. (Saila Huurinainen 2008.)

4 Exercise 3 CRM-ECC Business Case Documentation

This section of the report includes a documentation of a business case for the customer. In this case a lead-activity-opportunity-contract business chain is created. Finally SAP ECC customer delivery is created to CRM customer order. SAP ECC and SAP CRM can share the information used in this case. The information can also be accessed from SAP BW for analysis and reporting purposes for instance. In this case however, SAP BW functions are not in use. You can follow the whole from the process chart (Appendix 1).

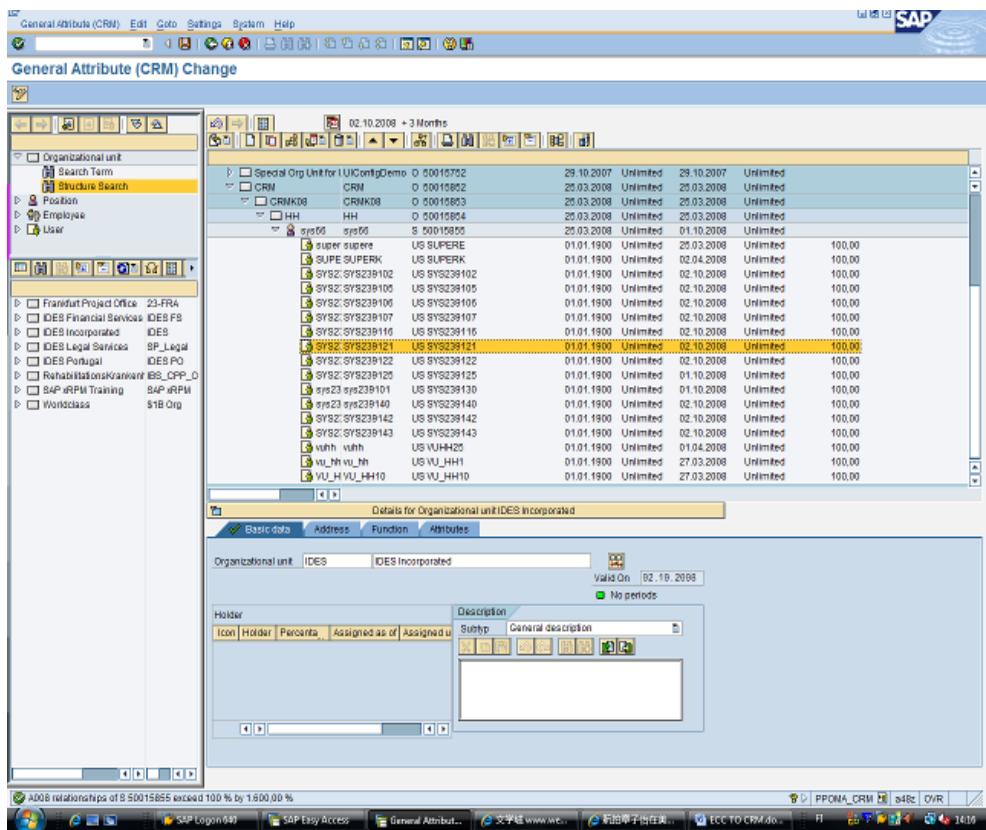
To be able to start the business case, the master data must be entered first into the system. First we create a customer in SAP ECC. Customer data is automatically available in SAP CRM. In this phase we setup the sales organization code, division channel and also add the customer data in SAP ECC (Picture 5).



Picture 5. Adding customer data in SAP ECC

Next we need to create a new material for the business case. The material data is stored in ECC such as the material details i.e. the list of materials sold in the company, the price per quantity, and discounts if any respective of volume or quantity, distribution channel, etc. The

plant or point of distribution is also defined in this area as it is important because the company may have several plants respective of how wide an area they cover i.e. a company can have a plant in Tampere for Tampere and close residents service delivery and in Helsinki for Helsinki residents and its metropolitan areas. The material data is also available in SAP CRM. At this point we can also create a new employee into SAP CRM (Picture 6). A lead is information about a customer which can be used in a business for things such as business possibilities; it is done mostly during company exhibitions, marketing survey or research surveys. In this case we enter information is for tracking the customer's activities for the management purpose.



Picture 6. Adding employee data in SAP CRM

Next a lead is created in SAP CRM (Picture 7). A lead is an information about a customer. In this case we enter information such as customer's contact person, responsible employee and origin and priority of the case.

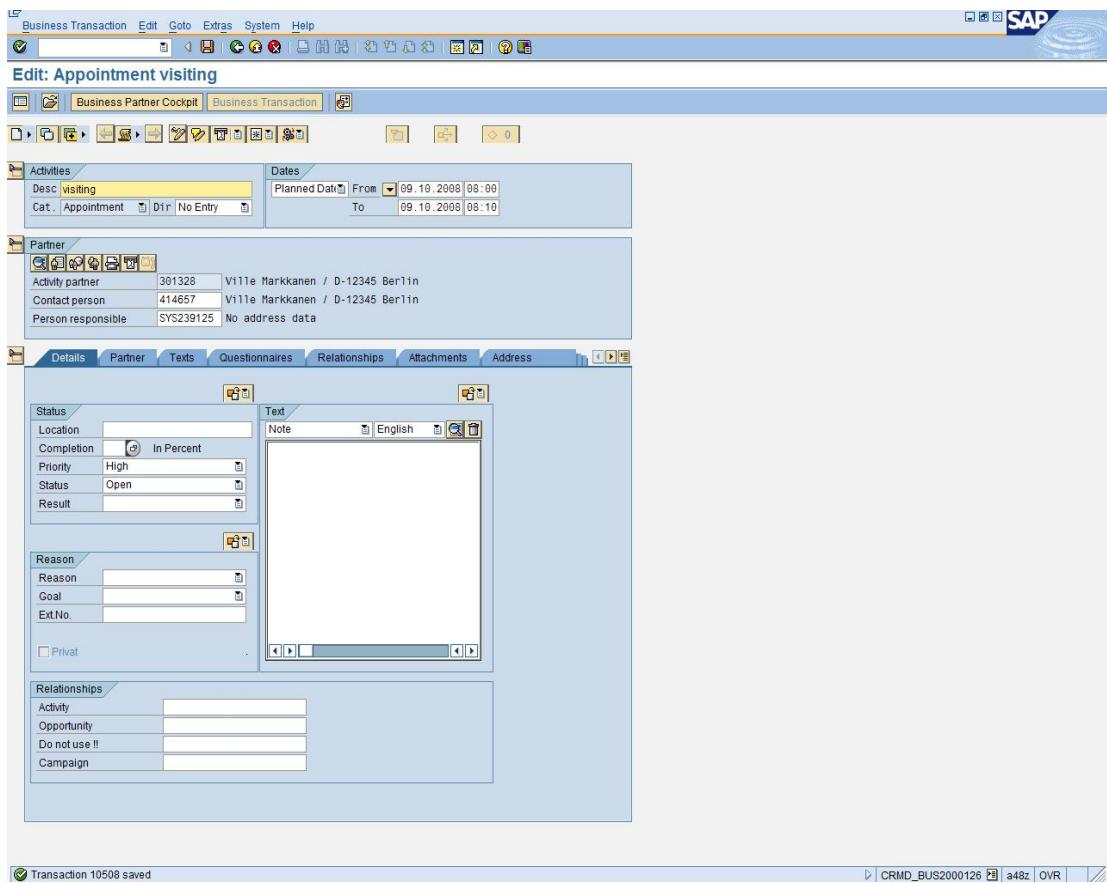
The screenshot shows the SAP Business Transaction interface for creating a lead. The title bar reads "Edit: Case Accident 463". The main area contains several tabs: Details, Partner, Texts, Relationships, Products, Evaluation, Actions, and Attachments. The "Details" tab is selected. The form fields include:

- General Information**: Description: Customer case FSLL 463; Sales prospect: 301328 V111e Markkanen / D-12345 Berlin; Contact person: 414657 V111e Markkanen / D-12345 Berlin; Employee responsible: SYS239125 No address data; Sales employee: SYS239125 No address data.
- Status**: Status: Open; Status Since: 09.10.2008; Reason: (empty).
- Dates**: Date Type: From Date Rule: Start Date: Lead; Expected End Date: Lead.
- Qualification**: Qualification Level: (empty); Qualification Level (Automatic): (empty).
- Classification**: Group: Internet Lead; Priority: High; Origin: Internet.
- Relationships**: Ind. Object: (empty).

At the bottom left, a message says "Transaction 463 saved". At the bottom right, there are navigation links: CRMD_BUS2000108, a48z, OVR, and a help icon.

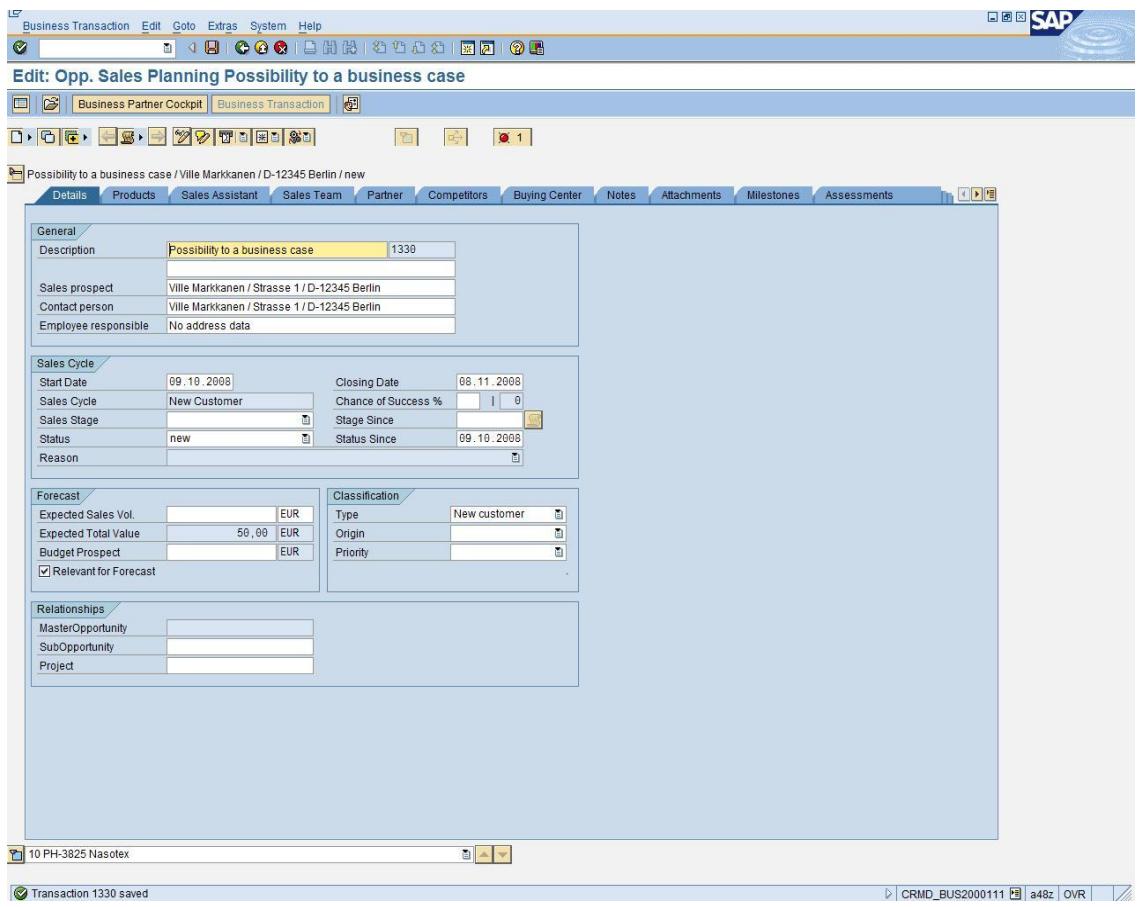
Picture 7. From this picture can be seen that a lead number 463 has been created.

In the next phase an activity is created. Activities are documents for recording information and planning actions at any time during the customer's relationship lifecycle for instance, telephone calls, customer calls, general preparation of tasks like reminders of appointments etc. In this case description of the activity, priority and activity partner are entered into SAP CRM (Picture 8). Also an organizational unit is selected.



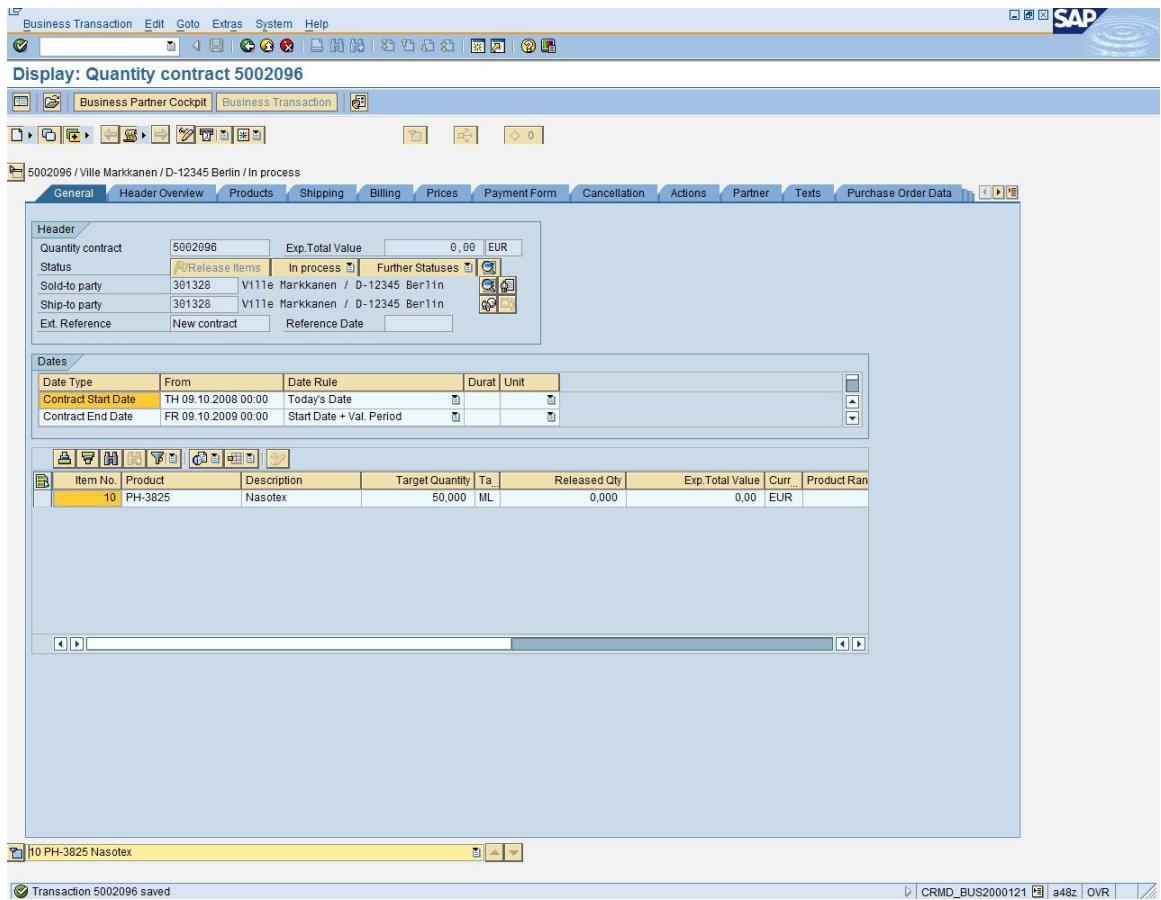
Picture 8. From this picture can be seen that an activity number 10508 has been successfully created.

Next an opportunity is created. An opportunity is hereby defined as a hub for the sales process, from which activities, contracts, offers and orders can result, as it represents a recognized possibility for a business transaction such as a sale of a product or service. In this case opportunity sales planning is selected. Also description of the opportunity, sales prospect, opportunity group and sales organization unit are entered into SAP CRM (Picture 9). Material data is also entered. In this case customer orders 50 units of material PH-3825.



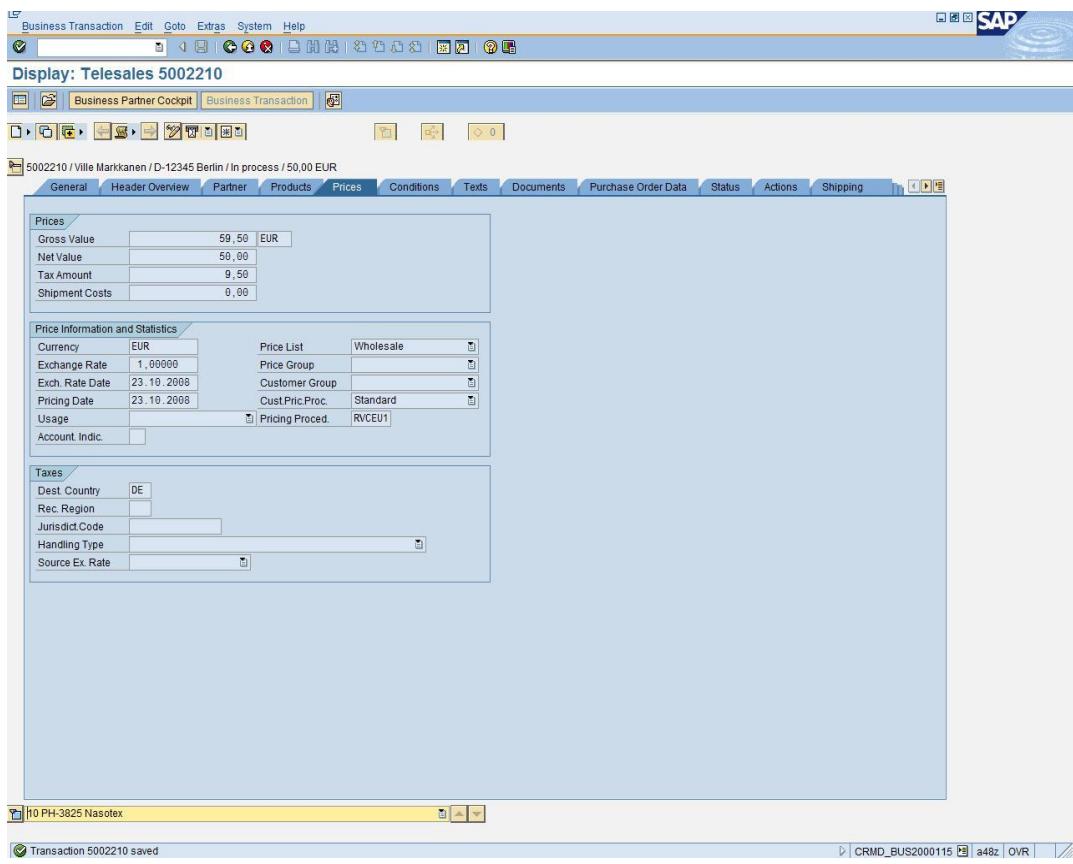
Picture 9. From this picture can be seen that an opportunity number 1330 has been successfully created.

Next a contract is created into SAP CRM. In this case a quantity contract is created. A contract is a framework agreement that allows the customer to purchase products under pre-agreed conditions such as price reduction. A quotation is instead a legally binding acceptance to deliver certain products within a given time frame and at a given price. Next customer number, sales organization and external reference text will be entered. Also the product and ordered quantity are entered into system (Picture 10). Usually customer contract can also be updated to SAP BW.

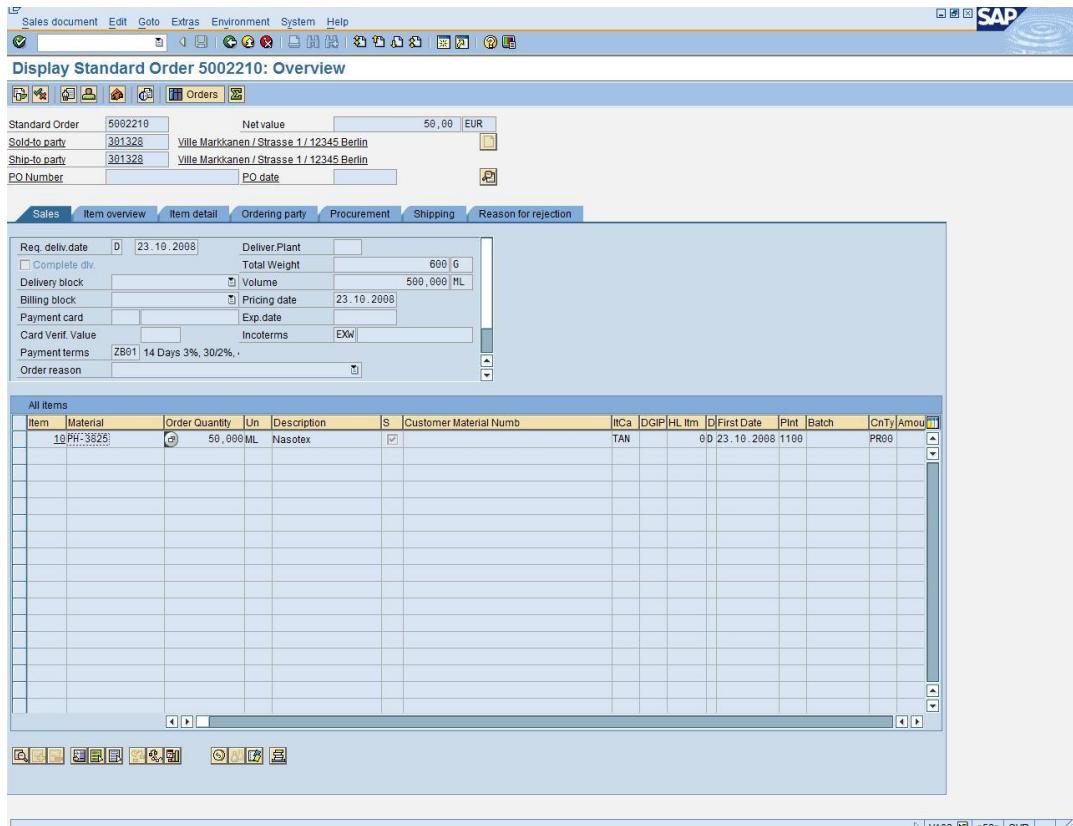


Picture 10. From this picture can be seen that a contract number 5002096 has been successfully created.

In the next phase a sales order is created. In this case sales order type telesales is used. Also the customer number, sales organization, ordered product and quantity are entered into system (Picture 11). An order is a customer's demand to a business to deliver a certain amount of product(s) or carry out a service at a particular point in time. The corresponding contract is found automatically from the system. Usually sales order can also be updated to SAP BW. Next the sales order can be checked in SAP ECC to ensure that all the data is correctly saved (Picture 12).

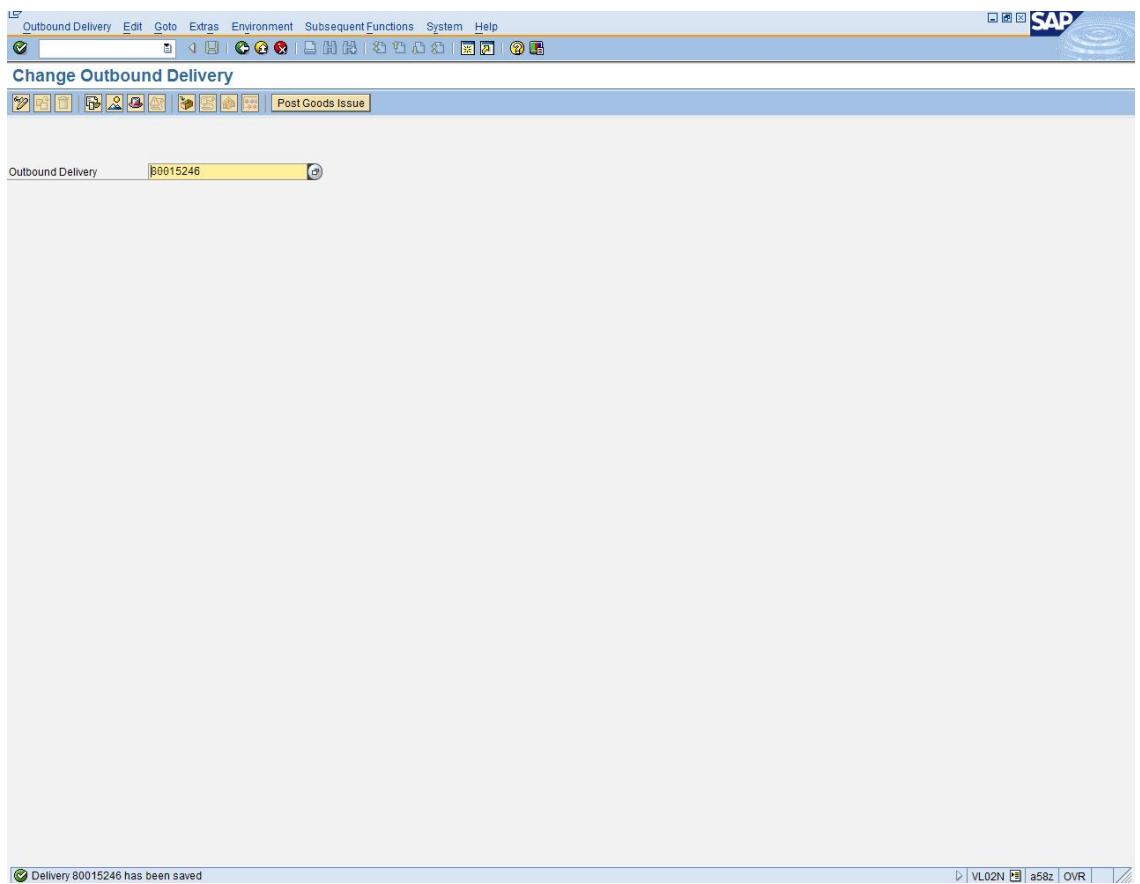


Picture 11. From this picture can be seen that a sales order number 5002210 has been successfully created.



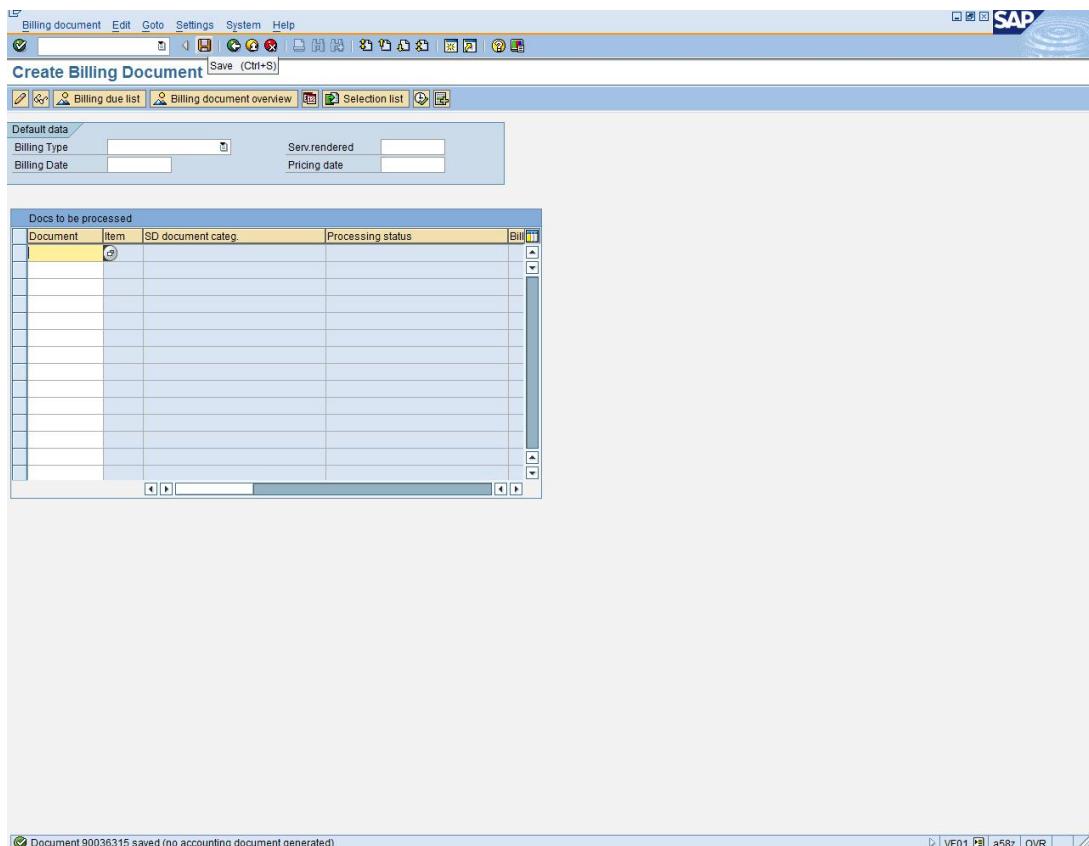
Picture 12. From this picture can be seen that all the saved data is shown correctly in SAP ECC

Next the ordered products are ready to be picked up from the warehouse. The sales order number and storage location are entered into SAP ECC. Now the information is updated in BW, the delivery process is done and completed (Picture 13). This can be confirmed by obtaining a delivery number. Now the delivery is ready for invoicing and the information is updated in BW. At this point in time the button post goods issue is pressed after doing the picking, so that the system can check the picked goods from ECC against what we have in the warehouse. If the system indicated that we don't have enough goods/material for deliverance then we have to re-check our stock situation by pressing transaction code MB1C.

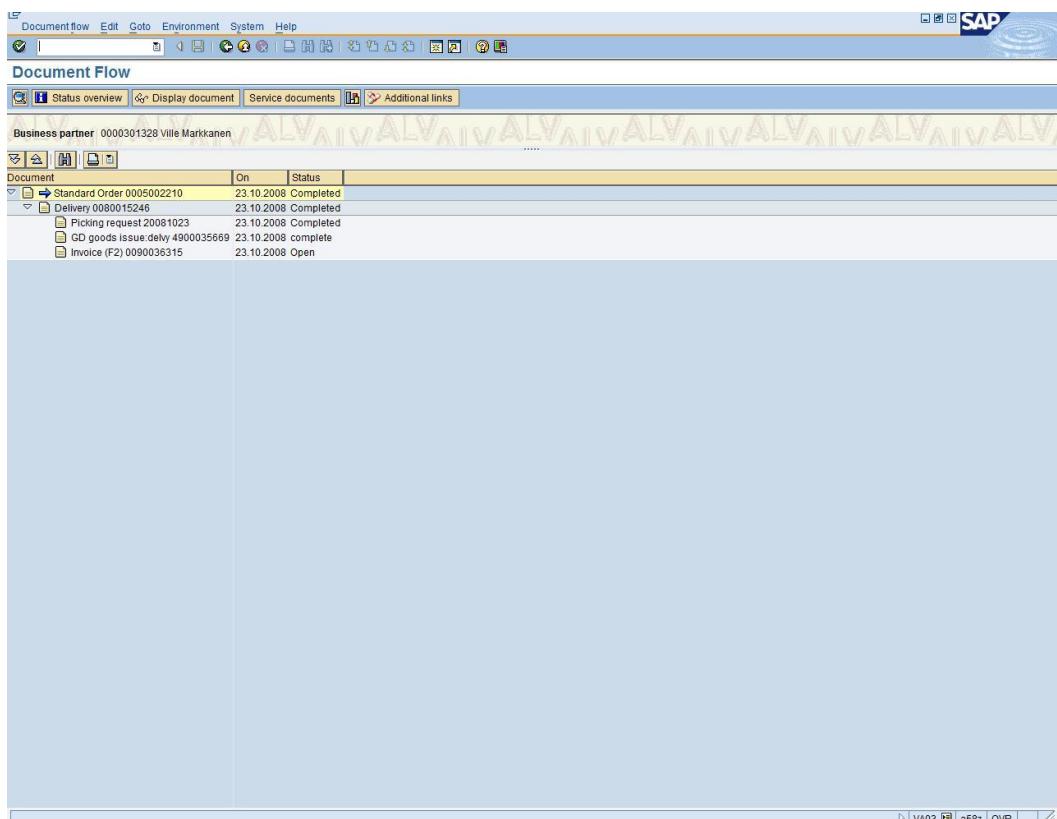


Picture 13. From this picture can be seen that a delivery number 80015246 has been successfully created.

Next an invoice is created into SAP ECC. The invoice process is created by a transaction code VF01 and the system checks the situation in the master data and if everything is ok, we obtain an invoice number and the data is updated in BW respectively(Picture 14). All the created documents can be seen from the document flow in SAP ECC (Picture 15). From the document flow can also be seen in which phase the processing of the case is.

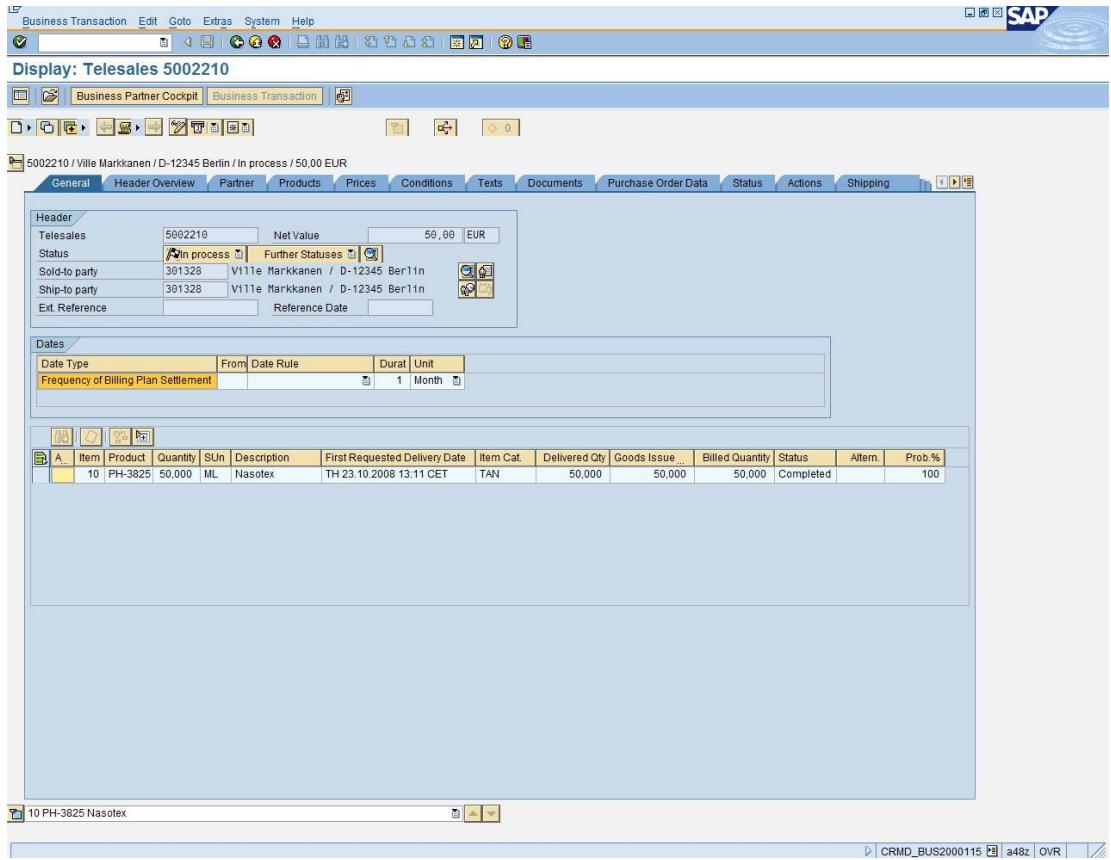


Picture 14. From this picture can be seen that an invoice number 90036315 has been successfully created.



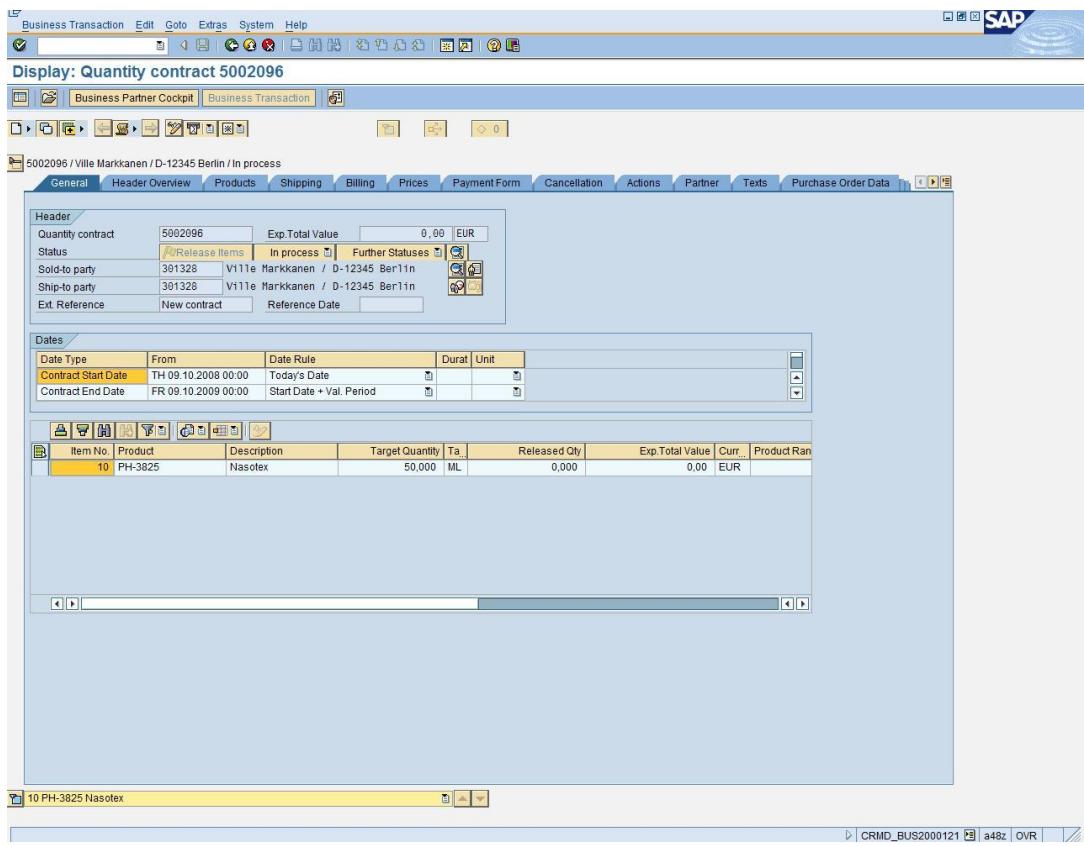
Picture 15. From the document flow can be seen that all the phases have been completed successfully. The last phase is waiting for customer's payment.

The procedures made to sales order in SAP ECC can be also checked from SAP CRM (Picture 16).



Picture 16. From this picture can be seen that all the data is shown correctly in SAP CRM.

Also the present status of the contract can be checked from SAP CRM (Picture 17). At this point in time it's important to note that when checking the contract situation in CRM, if the Release Qty figure is higher than the Target Qty figure then you should know that the whole contract is used or goods have been delivered. Information considering the delivery and the invoice can also be updated to SAP BW.



Picture 17. This picture shows the status of the contract when the case is successfully completed.

5 Exercise 4 BW Documentation

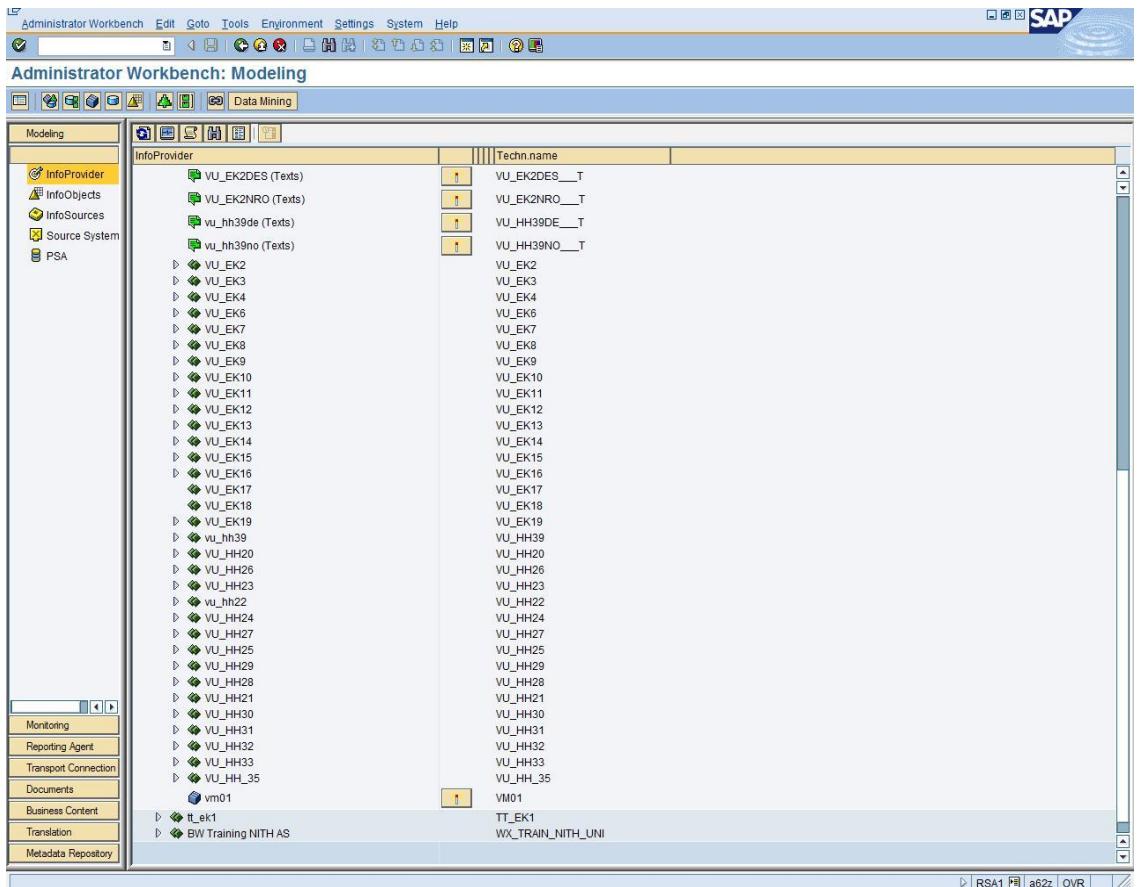
The aim of this exercise is to import foreign data into SAP BW and make it to display the imported data. SAP BW or Business Intelligence is a data warehouse solution for SAP, it allows users to analyze data from operative SAP applications as well as all other business applications and external data sources such as databases, online services and the internet. It includes the administrator workbench which is the tool for controlling, monitoring and maintaining all of the processes connected with the staging and processing in the Business information warehouse. The necessary actions like creating an InfoCube and transfer rules are made to complete this exercise. In this case a CSV file containing a purchasing report is uploaded into system and its data is analyzed. (Gupta, Haltenhof, Wagler & Yiyang 2006, 4.)

Finally a report is created by using Business Explorer (BEx). BEx provides flexible reporting and analysis tools for strategic analyses, operational reporting, and decision-making support within a business. These tools include query, reporting, and analysis functions. As an employee with access authorization you can evaluate past or current data on various levels of detail, and

from different perspectives, not only on the Web but also in MS Excel. (Gupta, Haltenhof, Wagler & Yiyang 2006, 32.)

To be able to import data to SAP BW an InfoArea has to be created by using SAP BW's Administrator Workbench . An InfoArea is an element which is used for grouping meta-objects in SAP BW. In this case all the created parts of the process are named as "vm01".

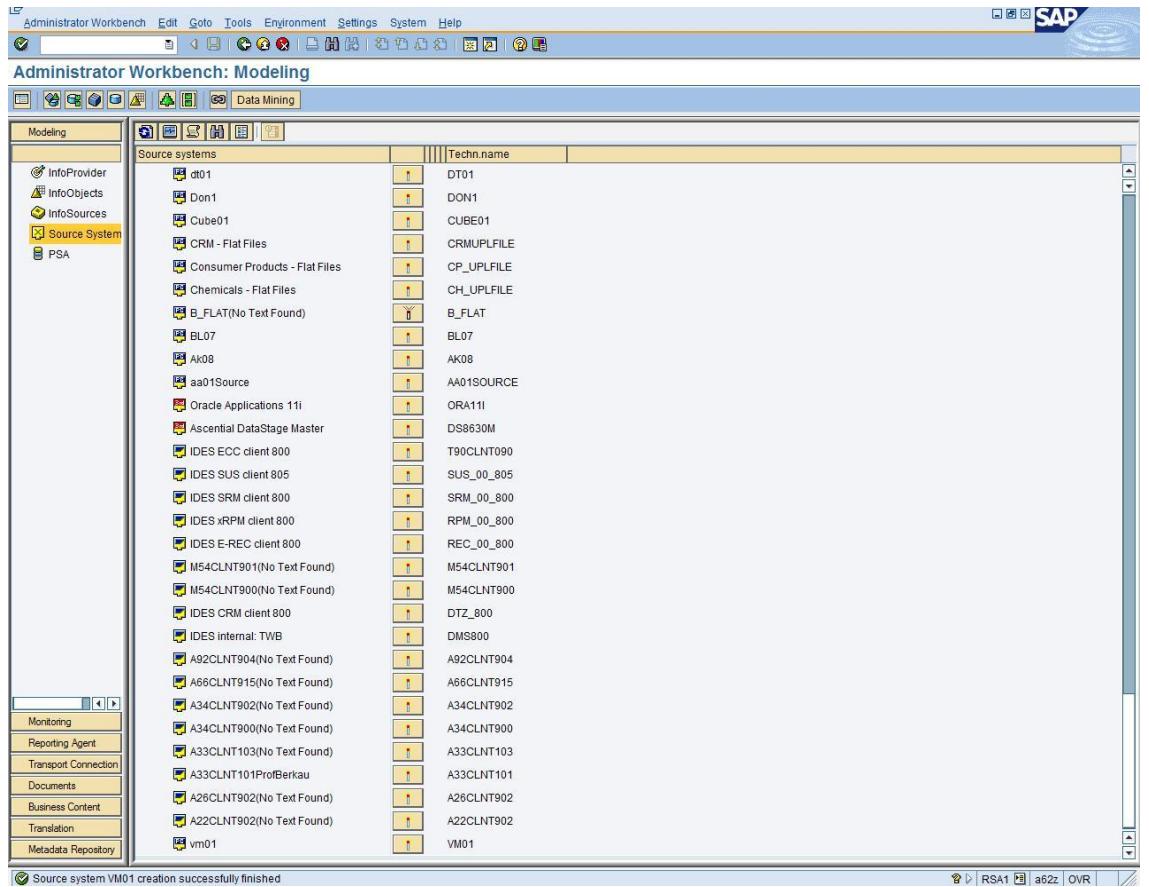
Next an InfoCube is created (Picture 18). An InfoCube can be described as a type of InfoProvider, where the data is stored. An InfoProvider is an object which is used to create queries in BEx. All InfoProviders are assigned to InfoArea. InfoCube consists of InfoObjects and its data can be analyzed by queries.



Picture 18. From this picture can be seen that an InfoCube vm01 has been successfully created.

In the next phase InfoObjects which are uploaded as characteristics, time characteristics and key figures into the InfoCube are selected. The following key figures and characteristics are created: vm01des (item description), vm01num (item number), vm01qua (item quantity) and

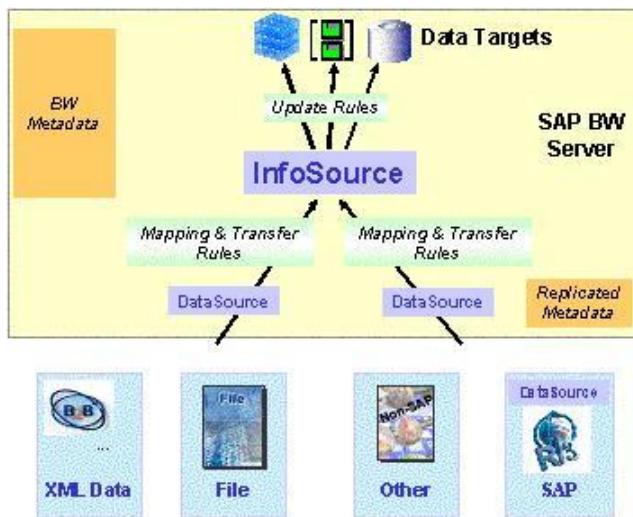
Calendar day. Next a Source System and an InfoSource are created (Pictures 19 & 20). InfoSource prepares consolidated data for updating to the data targets (Picture 21).



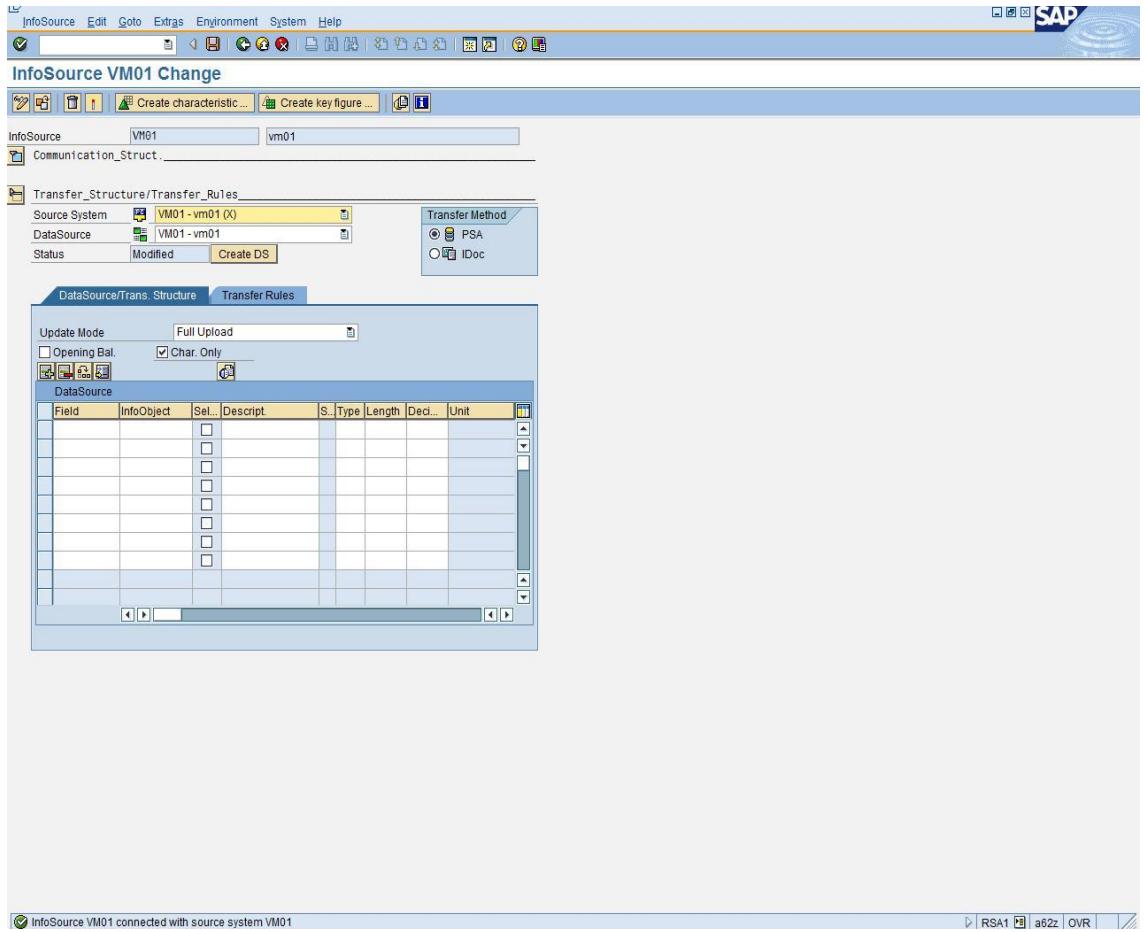
The screenshot shows the SAP Administrator Workbench interface. The left sidebar has a tree view with 'Modeling' selected, showing 'InfoProvider', 'InfoObjects', 'InfoSources', 'Source System' (which is highlighted in orange), and 'PSA'. The main area is titled 'Administrator Workbench: Modeling' and contains a table titled 'Source systems'. The table lists various source systems with their names and codes. A message at the bottom says 'Source system VM01 creation successfully finished'.

Source systems	Techn.name
dt01	DT01
Don1	DON1
Cube01	CUBE01
CRM - Flat Files	CRMUPLFILE
Consumer Products - Flat Files	CP_UPLFILE
Chemicals - Flat Files	CH_UPLFILE
B_FLAT(No Text Found)	B_FLAT
BL07	BL07
Ak08	AK08
aa01Source	AA01SOURCE
Oracle Applications 11i	ORA11I
Ascential DataStage Master	DS8630M
IDES ECC client 800	T90CLNT090
IDES SUS client 805	SUS_00_805
IDES SRM client 800	SRM_00_800
IDES xRPM client 800	RPM_00_800
IDES E-REC client 800	REC_00_800
M54CLNT901(No Text Found)	M54CLNT901
M54CLNT900(No Text Found)	M54CLNT900
IDES CRM client 800	DTZ_800
IDES internal: TWB	DMS800
A92CLNT904(No Text Found)	A92CLNT904
A66CLNT915(No Text Found)	A66CLNT915
A34CLNT902(No Text Found)	A34CLNT902
A34CLNT900(No Text Found)	A34CLNT900
A33CLNT103(No Text Found)	A33CLNT103
A33CLNT101ProfBerkau	A33CLNT101
A26CLNT902(No Text Found)	A26CLNT902
A22CLNT902(No Text Found)	A22CLNT902
vm01	VM01

Picture 19. From this picture can be seen that a Source System vm01 has been successfully created.

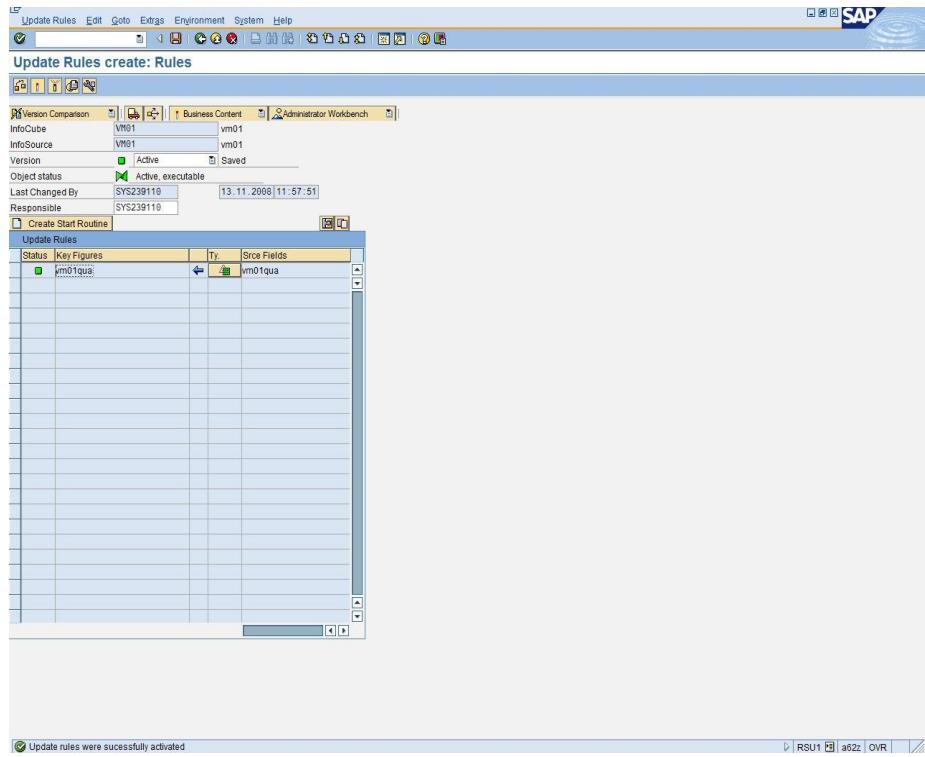


Picture 20. From this picture can be seen that an InfoSource has been connected with Source System.

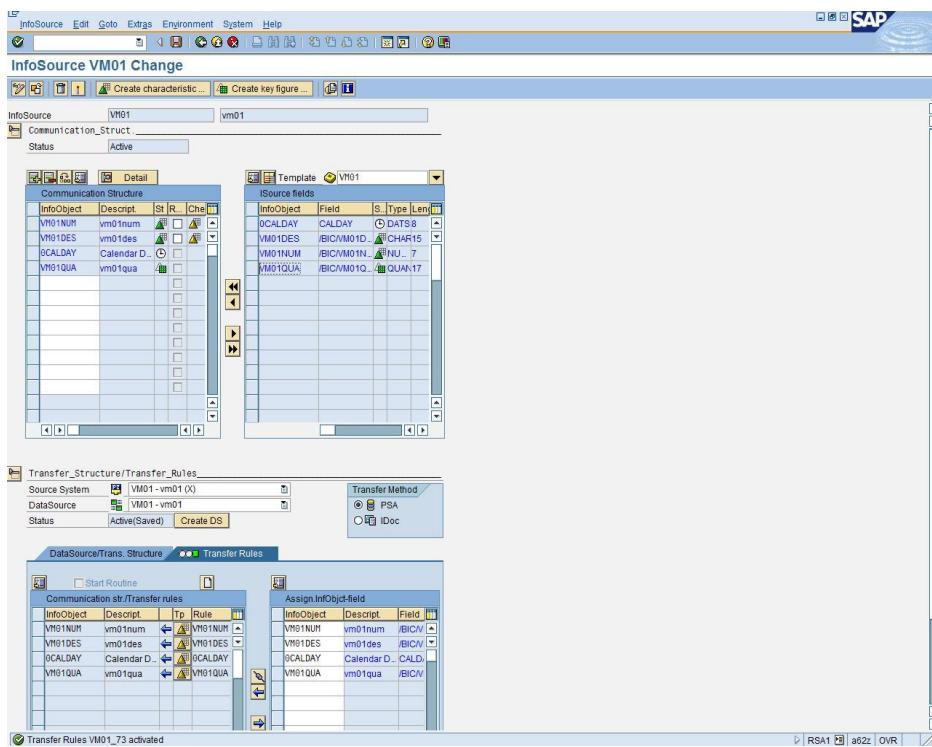


Picture 21. This picture shows the process of updating data to data targets in SAP BW.

Next update and transfer rules are edited and activated (Pictures 22 & 23). In the next phase an InfoPackage is created. InfoPackage helps to determine the conditions how the data is requested from a source system to SAP BW.

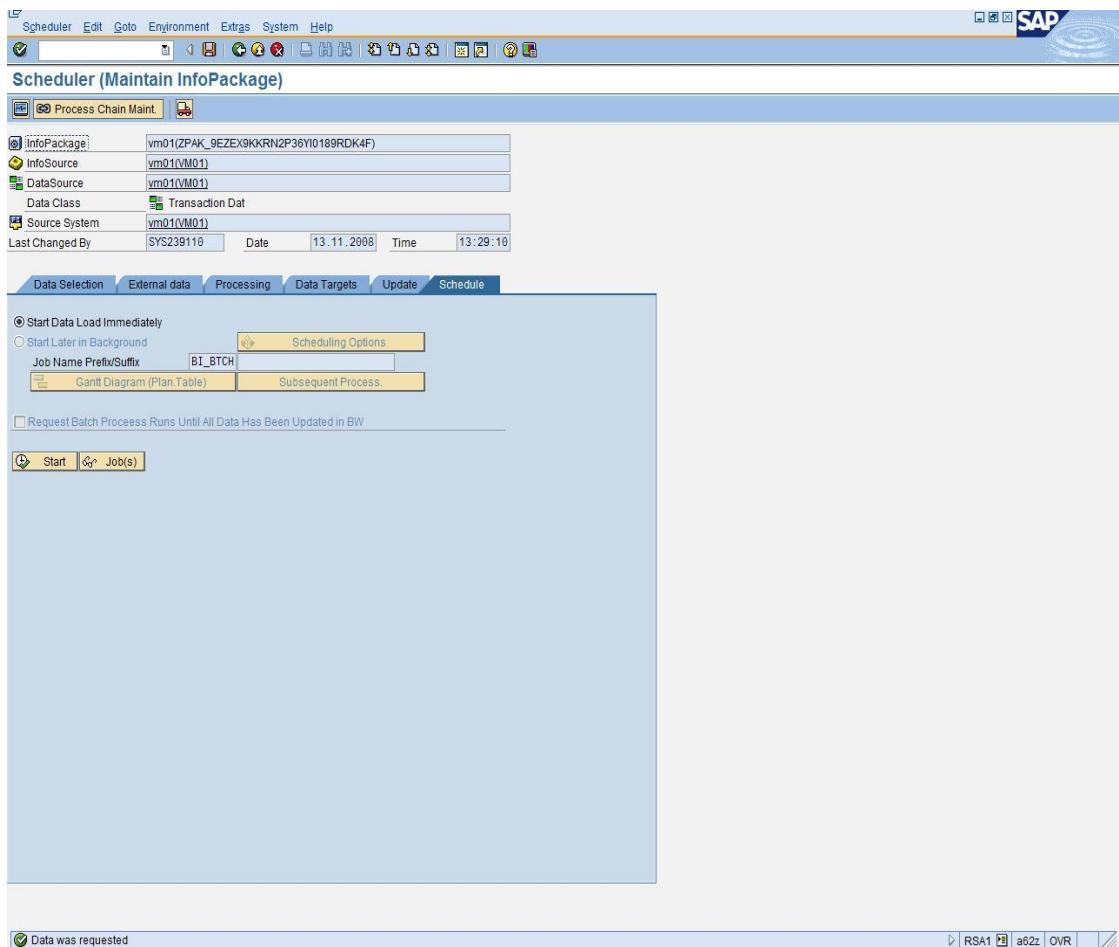


Picture 22. From this picture can be seen that the update rules have been successfully activated.



Picture 23. From this picture can be seen that the transfer rules have been successfully activated.

Next a .CSV file called "sap_bw_YT4" is uploaded to SAP BW (Picture 24). All the wished data fields are selected and the uploaded data in the InfoCube will be displayed (Picture 25).



Picture 24. From this picture can be seen that the data has been successfully uploaded into SAP BW.

VM01DES	vm01num	0CALDAY	VM01QUA
SAHA	5550143	11.01.2006	12.000
MITTA	2156694	20.01.2006	16.000
MUTTERI	1234567	18.01.2006	150.000
NAULA	7518996	05.10.2006	500.000
RUUVI	7654321	19.01.2006	1.500.000

Picture 25. From this picture can be seen that the data in the InfoCube is displayed correctly.

Next the Business Explorer (BEx) Analyzer is opened and a new query is made to InfoCube created earlier. BEx is a component of SAP BW and it provides reporting and analysis tools. Next a wished structure of the query is created using BEx's query designer. Then the query is saved and ran. The result of the query appears as an Excel sheet (Picture 26).

The screenshot shows a Microsoft Excel spreadsheet titled 'vm01_query1'. The data is organized into several sections. At the top, there are rows for 'Calendar Day' and 'Quantity' with corresponding columns for dates (11.1.2006, 18.1.2006, 19.1.2006, 20.1.2006, 5.10.2006) and an 'Overall Result' column. Below these, there are sections for 'MITTA', 'MUTTERI', 'NAULA', 'RUUVI', 'SAHA', and 'Overall Result'. Each section contains a 'Result' row with values such as '150 PC' or '500 PC'. The Business Explorer toolbar is visible at the bottom right of the Excel window.

Picture 26. This picture shows the result of a successful query as an Excel sheet.

6 Exercise 4.1 MultiCube Documentation

The exercise 4.1 is the advancement of the previous exercise 4.0, and since in the previous exercise we had the introduction of using the SAP BW software for carry out business analysis and also using Business explorer (i.e practical experience). In this case we uploaded two separate .CSV files to InfoCubes in SAP BW for analyzing and reporting purposes. In this case the .CSV files include contact and contract data. Consequently two InfoCubes are created namely

Contact (vm02) and contract (vm05) InfoCubes.

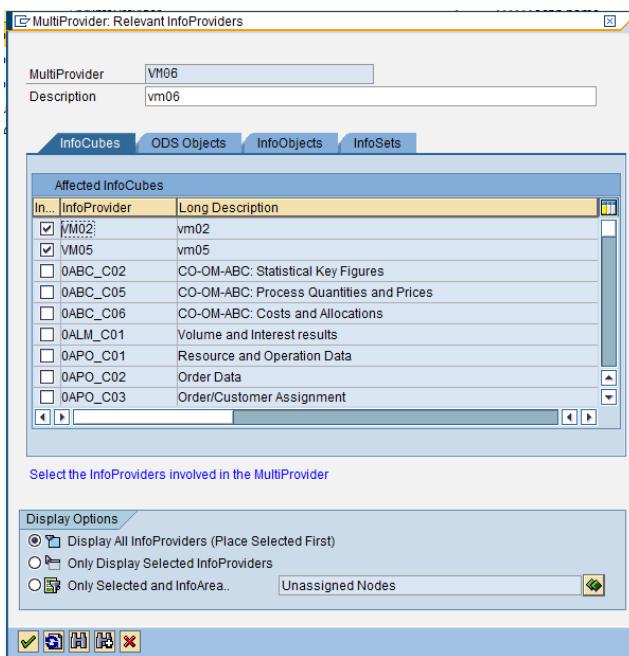


Then the InfoCubes are linked by creating a MultiProvider to be able to combine data from the .CSV files. A MultiProvider can be described as a type of InfoProvider that combines data from other InfoProviders like InfoCubes and InfoObjects. A MultiProvider makes data easily

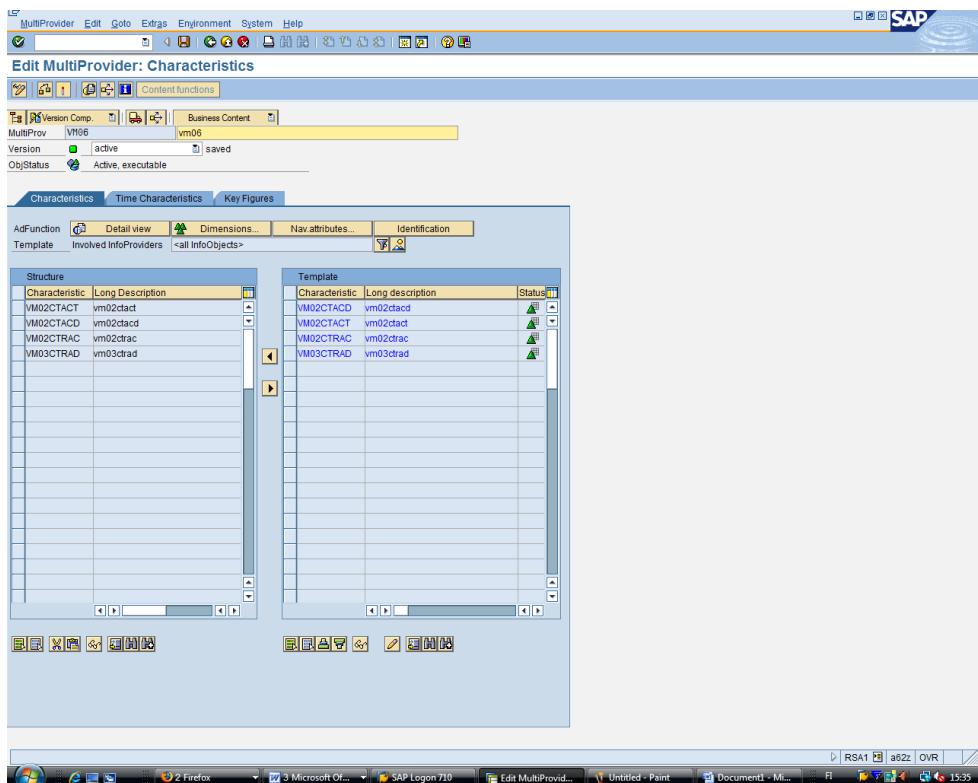
available for reporting purposes. All the data of a MultiProvider comes from InfoProviders, therefore the MultiProvider does not itself contain any data. (SAP 2008c.)

As done in previous exercise, transfer rules and other necessary actions are made to complete the process. InfoCube vm02 characteristics include: contract number, contact number, contact date, calendar day and number of actions as a keyfigure. InfoCube vm05 characteristics include: contract number, contract date, calendar day and value of the contract as a keyfigure.

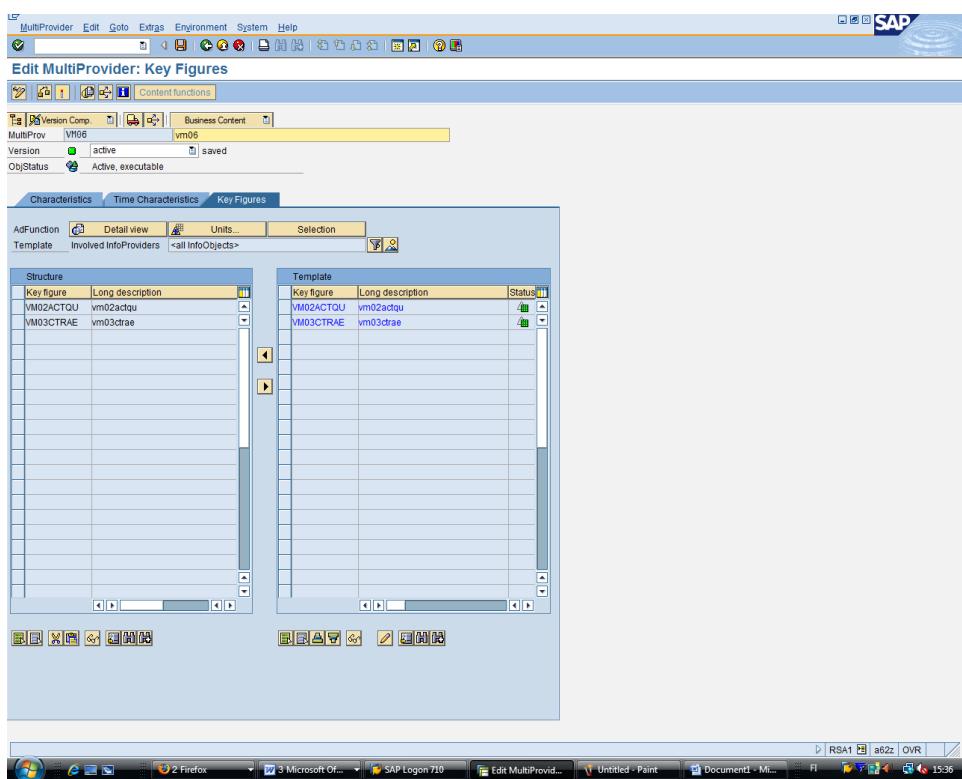
Next a MultiProvider is created. First the created InfoCubes are connected to a MultiProvider in a selected specific InfoArea (Picture 27). Then the characteristics are chosen (Picture 28). The characteristics are based on the InfoCubes created earlier. After the creation of the MultiProvider characteristics, the characteristics are assigned to corresponding attributes of the InfoCubes. Next the MultiProvider is ready to be activated. The data flow from InfoPackage to update rules to InfoSource and to Source System and all the way to InfoCubes and MultiCube can be seen from the chart (Appendix 2).



Picture 27. In this screen the InfoCubes are connected to Multiprovider.



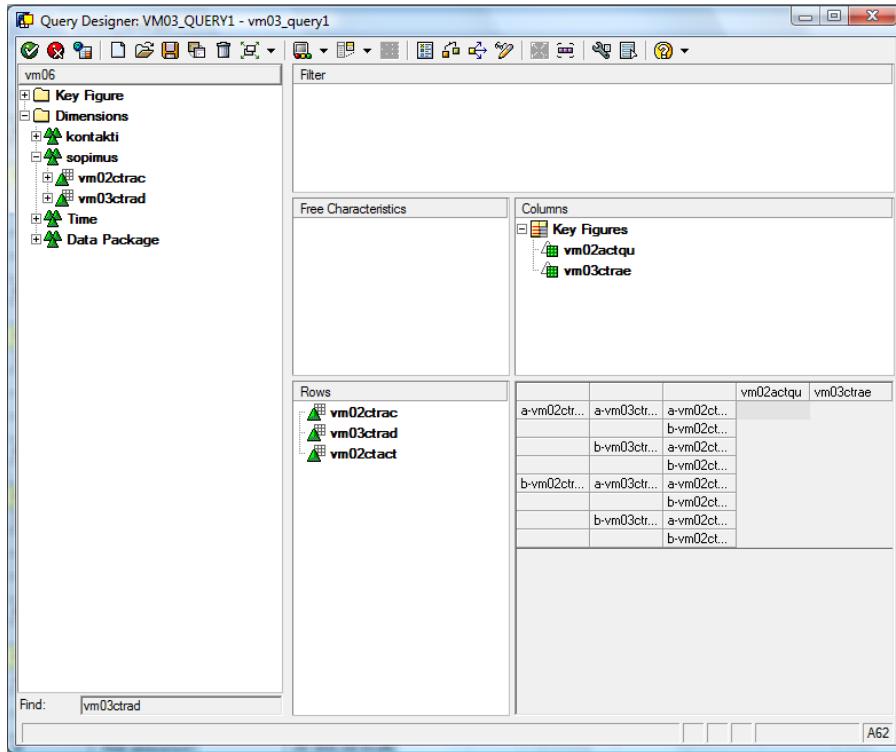
Picture 28. This picture shows the characteristics of the MultiProvider.



Picture 29. This picture shows the key figure characteristics of the MultiProvider.

Next the Business Explorer (BEx) is opened and a new query is made to the MultiProvider created earlier. Quantity of actions and value of the contracts are put to “columns” field. Contract number, contract date and contact number are put to “rows” field (Picture 30). Because

in this case we want focus on quantity of actions and value of the contracts these put to “columns” field. Then the query is saved and ran (Picture 31).



Picture 30. This picture shows the query setting for BEx.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
9	vm02ctrac	vm02ctrad	vm02ctact	vm02actqu	vm03ctrae									
10	100	11.2006	K	3.000										
			P	3.000										
			S	4.000										
			Result	10.000										
14	# Not assigned			12 000,00 EUR										
15	Result			12 000,00 EUR										
16	Result			10.000	12 000,00 EUR									
17	101	11.2006	K	3.000										
			P	10.000										
			S	7.000										
			Result	20.000										
21	# Not assigned			10 000,00 EUR										
22	Result			10 000,00 EUR										
23	Result			20.000	10 000,00 EUR									
24	102	2 11.2006	K	8.000										
			P	10.000										
			S	2.000										
			Result	20.000										
28	# Not assigned			15 000,00 EUR										
29	Result			15 000,00 EUR										
30	Result			20.000	15 000,00 EUR									
31	103	3 11.2006	K	5.000										
			P	1.000										
			S	4.000										
			Result	10.000										
35	# Not assigned			10 000,00 EUR										
36	Result			10 000,00 EUR										
37	Result			10.000	10 000,00 EUR									
38	104	3 11.2006	K	2.000										
			P	5.000										
			S	6.000										
			Result	13.000										
42	# Not assigned			16 000,00 EUR										
43	Result			16 000,00 EUR										
44	Result			13.000	16 000,00 EUR									
45	105	4 11.2006	K	13.000										
			P	14.000										
			S	27.000										
48	# Not assigned			20 000,00 EUR										
49	Result			20 000,00 EUR										
50	Result			27.000	20 000,00 EUR									
51	Overall Result			100.000	83 000,00 EUR									
52														
53														
54														

Picture 31. This picture shows the result of a successful query as an Excel sheet.

7 Feedback

As group four in the SAP 2 Business Application part 2, we have had the opportunity of gaining further knowledge in advancement of the SAP 1 R/3 Business Application and processs which some group members had an opportunity to study with you (Erkki Koskela) and others are doing it at the same time.

We have found this course very interesting and useful in business life, because nowadays ERP-programmes and Business Information Management are more and more important in business life. We think that the exercises corresponded real life business situations well. Allthough some parts of the instructions should have been perhaps a bit more detailed. It would have also been good to know how to upload data from difference data bases and XML files for instance. We would have been also very interested to see BusinessObjects in action. We think that the teaching was good and the progress of individual students was taken care well.

We would also like to thank Haaga-Helia university of applied sciences for making this course possible to both internal and external students as we have an opportunity of studying with people from other ethnic and cultural backgrounds which is important as a long life learning in the working environment as we meet people from different countries and cultures.

8 Conclusion

Under SAP ECC and CRM our group learned the process towards getting the contract as we learned that the main idea of CRM is to get the contract, and be able to keep customer details in the system for customer satisfaction increase in future a customer would like information of their dealing with our customer for a certain period of time, and also for the company to keep tract of data easily.

It also helps to analyze and manage customer data and the organization can have deeper information of customers, and also increases the quality of customer service. Consumers can receive such things as notification e-mails of status of their orders and business customers can view and analyze reports from extranet. This also decreases the overload of customer service.

Business Intelligence helps companies to analyze business data. Business data consists of for example financial data. Companies can find relevant business information by using data mining.

Data can be analyzed in multiple ways and companies can create interactive reports. This makes possible to analyze business data very efficiently. With BI companies can understand their business better. They can understand where the money goes and comes. The right information is also available at the right place and at the right time. This makes the processes very efficient and it saves a lot of resources.

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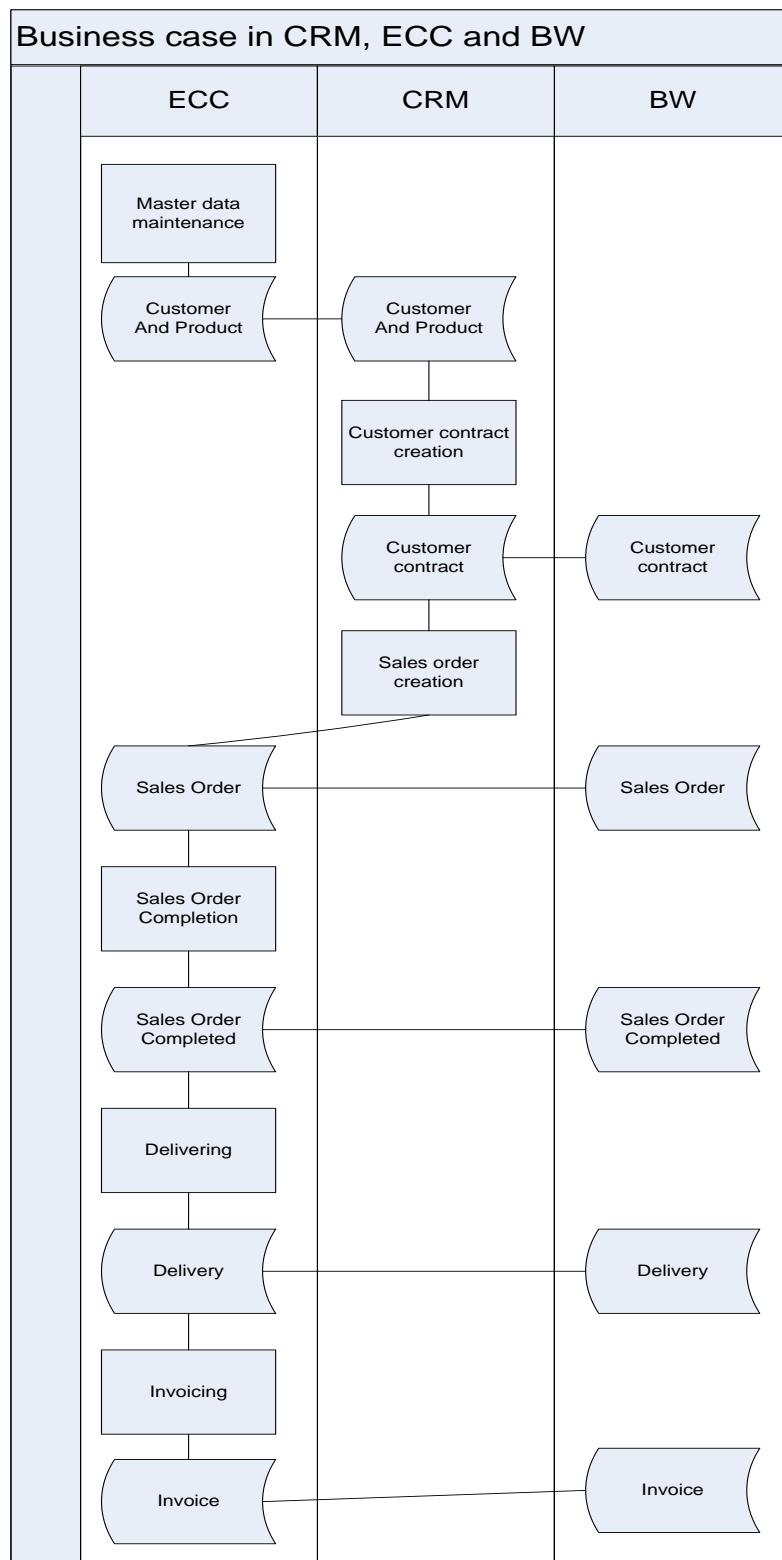
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Appendix 1: Process Overview of CRM, ECC and BW/BI Business Case



Appendix 2: MultiCube Data Flow

