METROPOLIA UNIVERSITY OF APPLIED SCIENCES

FACULTY OF TECHNOLOGY

Bachelor's Degree in Industrial Management

Bachelor's Thesis

Corporate Accounting as a Part of Order-Delivery Process in Enterprise Resource Planning – SAP System Case Metropolia

Author: Janne Kumpulainen
Instructor: Erkki Koskela
Instructor: DSc Ansa Harju

Approved: 1 December 2009

Erkki Koskela
Senior Lecturer

PREFACE

This thesis was interesting and challenging journey, concluding the years throughout my Industrial Management studies. I am happy and grateful for all those experiences I faced all the way towards conducting this study.

I would like to thank my Instructors Ansa Harju and Erkki Koskela for their contribution to this study and all the help they gave me that made this study happen. I would like to thank Metropolia University of Applied Sciences for providing me an opportunity to work with fully functioning, industry simulating, and professional level SAP software.
I also would like to thank my friends and family for the support and warm thoughts I received while I was concentrating on this study.

Helsinki, 15 November 2009

Janne Kumpulainen

Frank Lloyd Wright:

"I know the price of success: dedication, hard work, and an unremitting devotion to the things you want to see happen."

![Metropolia]

ABSTRACT

Name: Janne Kumpulainen
Title: Corporate Accounting as a Part of Order-Delivery Process in Enterprise Resource Planning – SAP System Case Metropolia
Date: 1 December 2009   **Number of pages:** 46
Degree Programme: Bachelor's Degree Programme in Industrial Management
Instructor: Erkki Koskela, LicSc (Econ), Senior Lecturer **Instructor: DSc (Tech) Ansa Harju, Principal Lecturer**

This Bachelor's Thesis study was initiated to find accounting connections configured in order-delivery process operated in the SAP enterprise resource planning platform, in order to add value to the teaching material used in Metropolia University of Applied Sciences. The need for this study arose from desire to upgrade the messages offered about the order-delivery process at Metropolia University of Applied Sciences.

The theoretical background of this study consists of two parts. First part of the theory consists of enterprise resource planning, enterprise resource planning system, order-delivery process and accounting. Second part is overview to the SAP modules used in the practice phase of this study.

The practical phase of this study was conducted in the SAP enterprise resource planning system, based on the teaching scenarios currently used as a part of the lectures for order-delivery process. The scenarios are configured to the SAP system and used for locating the accounting configurations in the order-delivery process by running tests in the created environment.

The results were clear and provided the desired outcome set at the beginning of the study. The configured accounting connections to the order-delivery process were located and analyzed. Teaching material was upgraded to answer better to the subject's needs and to give wider perspective to the relationship between order-delivery process and company's management and financial accounting.

OPINNÄYTETYÖN TIIVISTELMÄ

Työn tekijä: Janne Kumpulainen

Työn nimi: Yrityksen laskentatoimi osana tilaus-toimitusketjua toiminnanohjausympäristössä – Tapaus Metropolian SAP-järjestelmä

Päivämäärä: 1.12.2009   **Sivumäärä:** 46 s.

Koulutusohjelma:
Tuotantotalous

Työn ohjaaja: Lehtori, KTL Erkki Koskela,
Työn ohjaaja: Yliopettaja, TkT Ansa Harju

Tämän insinöörityön tutkimuksen tarkoituksena oli löytää yhteydet tilaus-toimitusketjun ja yrityksen laskentatoimen välillä SAP-toiminnanohjausjärjestelmässä ja luoda lisäarvoa Metropolia Ammattikorkeakoulussa käytettävälle tilaus-toimitusketjun opetusmateriaalille. Tutkimuksen lähtökohtana oli halu kehittää tilaus-toimitusketjun opetuksen sisältöä Metropolia Ammattikorkeakoulussa.

Tutkimuksen teoreettinen tausta koostuu kahdesta osasta. Ensimmäisessä osassa käsitellään toiminnanohjausta, toiminnanohjausjärjestelmää, tilaus-toimitusketjua sekä laskentatointa. Toisessa osassa käsitellään tämän tutkimuksen käytännön osuudessa käytettäviä SAP-järjestelmän moduuleja.

Insinöörityön käytännön tutkimuksen osuus toteutettiin SAP-toiminnaohjausjärjestelmässä toteutettavien, opetuksessa käytettävien, tilaus-toimitusketjuskenaarioiden avulla. Skenaariot määritetään SAP-toiminnanohjausjärjestelmään. Luodussa testiympäristössä ne ovat käytettävissä laskentatoimen määritysten löytämiseksi tilaus-toimitusketjusta testiajoja suorittamalla.

Tutkimuksen tulokset olivat selkeät ja ne vastasivat tutkimukselle asetettuihin tavoitteisiin. Tilaus-toimitusketjuun määritetyt laskentatoimen yhteydet löytyivät, ja saadut tulokset analysoitiin. Opetusmateriaalin päivittäminen vastaamaan aiheen vaatimuksia onnistui. Opetusmateriaali pystyy nyt tarjoamaan laajemman kokonaiskuvan tilaus-toimitusketjun ja yrityksen sisäisen ja ulkoisen laskentatoimen yhteyksistä.

Avainsanat: Tilaus-toimitus prosessi, ulkoinen laskentatoimi, sisäinen laskentatoimi, toiminnanohjaus, ERP

TABLE OF CONTENTS

ACRONYMS

BOM	Bill of Material
CO	Controlling (Management Accounting)
ERP	Enterprise Resource Planning
FICO	Financial Accounting and Controlling (Financial Accounting/Management Accounting)
FI	Financial Accounting
G/L	General Ledger (Account)
MIGO	Goods Receipt
MM	Materials Management
MRP	Material Requirements Planning
PP	Production Planning
SD	Sales and Distribution

LIST OF FIGURES

1   INTRODUCTION

Companies that produce either products or services use order-delivery processes in their operations. Also, no matter how big the company is, by law, accounting will be part of its operations as well. These operations can be time consuming and it may be hard to keep track in a company. Companies have taken Enterprise Resource Planning Systems as tools to upgrade the efficiency of the company operations. This point is case dependent and varies a lot depending i.e. on a company, their business sector and resources.

1.1   Background

Enterprise Resource Planning (ERP) and more precisely Enterprise Resource Planning System, is a tool for a company to manage its financial, human and material resource transactions. The modular structure of the Enterprise Resource Planning System can be illustrated as a honeycomb shown in Figure 1.
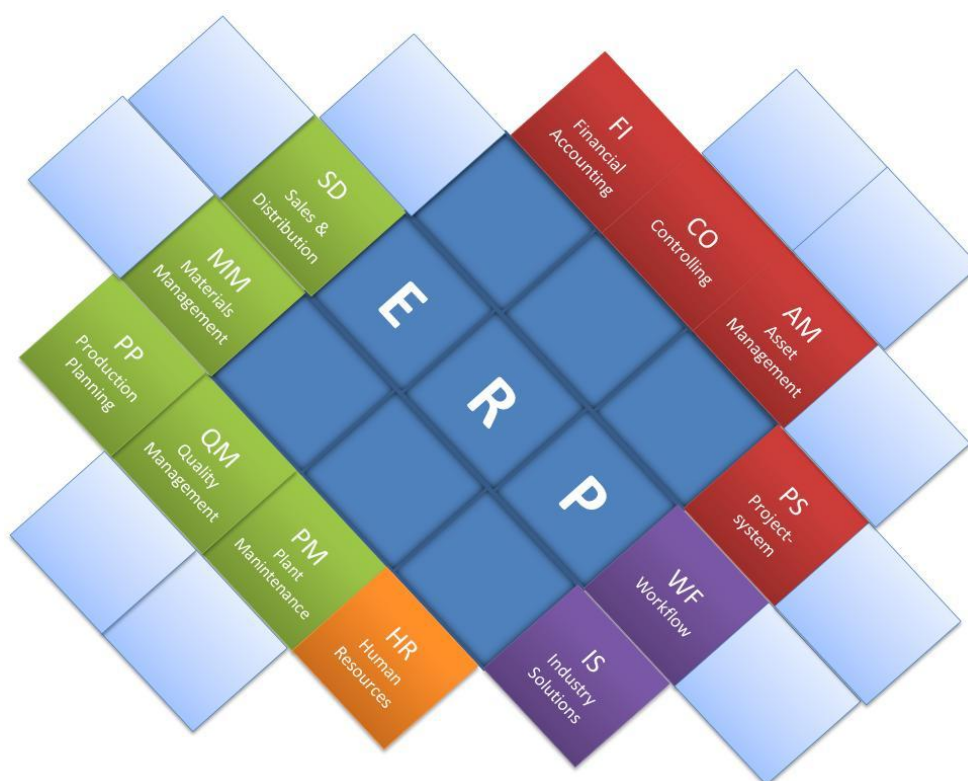

Figure 1: Enterprise Resource Planning (SAP AG SD 1996: 1.2)

The honeycomb of Figure 1 illustrates how modules with different functions are tied around the core, which is the ERP system itself. This study concentrates ton the modules starting from the top left; Production Planning (PP), Materials Management (MM), Sales and Distribution (SD), Financial Accounting (FI) and Controlling (CO). SD, MM and PP modules are used for operations like selling, manufacturing and distributing products whereas FI and CO modules are used to manage company internal and external financial operations. Other modules that are not used in this study can be such as Human Resources which are important for company, yet not essential for this study. Modules shown in the figure are just options that a company could have in its enterprise resource planning system. Not all of the modules from the example are in use in all companies; also other modules are available for companies to add to their systems.

The order-delivery process is a demand-based information flow. It starts with a customer placing an order and ends to a delivery and payment. In the middle, the delivering company takes needed actions to make successful delivery. It can be just as simple as delivering the ordered good from warehouse or bigger process including ordering parts from supplier and manufacturing the product afterwards before the delivery. (Sakki 1999.)

This study concentrates on locating the connections configured between the order-delivery process and accounting, in Enterprise Resource Planning System environment, and upgrading teaching material to cover the found connections. In this study, the practice phase is conducted in SAP system environment.

The SAP system is an enterprise recourse planning software created by SAP AG. SAP AG is a multinational software and consulting company founded in Waldorf, Germany, where its headquarters is also located. SAP AG is the largest European software corporation and the fourth biggest in the whole world. SAP AG provides enterprise software and support to various sizes of businesses globally.

The purpose of this study is to address the question how to integrate order-delivery process to accounting operations in SAP system and add value to the teaching material concentrated on the subject. The decision to focus on

these modules in SAP system was made due the fact that parts of it were already thought at the Metropolia University of Applied Sciences.

The order-delivery process in the SAP system includes three modules; Sales and Distribution, Materials Management and Production Planning, whereas the financial part consists of two modules together called FICO; Financial Accounting and Controlling, which is also known as Management Accounting. Figure 2 illustrates the relationship between the modules in order-delivery process and FICO.
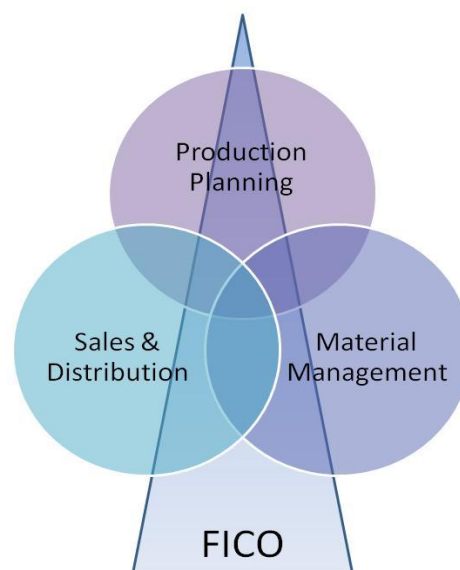
Figure 2: Order-Delivery Process in relation to the FICO

Figure 2 shows how all the modules in the Order-Delivery Process are connected with each other. They share certain information in order to make the cycle work desired, the most efficient way. Figure 2 also shows how the FICO is integrated to the Order-Delivery Process. FICO has to be integrated with all the modules in the Order-Delivery Process for it to be able to provide needed financial information on all the stages of the Order-Delivery Process.

Determination of the FICO integration is done on the basis of two functioning Order-Delivery Process scenarios. The goal is to strengthen the information value of these two scenarios by determining the integration points between the Order-Delivery Process and FICO. Regardless of the background of the

user of these upgraded scenarios, the information value for them rises up and the knowledge they gain will be on wider basis.

Based on this study, a user should be able to understand which actions in order-delivery process are configured to cooperate with accounting tools and what benefits' understanding this creates for the person.

1.2 Research Problem

Current teaching material about the order-delivery process in the SAP system does not cover the integration points between order-delivery process and FICO. Since all the functions are highly integrated in the ERP system it can be difficult to locate and understand which actions influence another. It is important in a company which operations include order-delivery process to be able to track the material flow and keep track on the financial transaction through out the whole process flow.

In order to create more value for the material and widen the knowledge within SAP system, it is essential to find how these two fields are integrated and how the information on integration points can be used.

The main research question of this study is:

> **How is the Corporate Accounting System Integrated with the Order-Delivery Process in the SAP system?**

The question can be divided into two sub-questions in order to clarify the desired outcome of the study. First, the integration between the Order-Delivery Process and the Financial Accounting and Controlling (FICO) is to be determined in the SAP system. Secondly, the study is set to give an answer how the information from the desired integration can be found and used for education purposes. From both, learning and teaching perspective.

The sub questions of this study are:

1. How to determine integration points between Order-Delivery process and FICO?

2. What information value can the determination of the integration points create for the teaching material?

The aim of this study is to add value to the order-delivery process teaching material by identifying configured FICO connections and making it comprehensive for larger variety of students to benefit from.

1.3 Approach and Method

To find an answer to the research question: "how is the Corporate Accounting System integrated with the Order-Delivery Process in the SAP system?" the approach to the research problem can be divided into two phases. The problem on hand is investigated by observing the existing scenarios and by running tests to identify the desired outcomes. A literature review is used to widen the background information on the subject and for strengthening the legibility of the study.

The literature review covers general overview on; enterprise resource planning as a concept and as a system, order-delivery process and accounting, including management accounting for internal use as well as financial accounting for external use. In addition, the literature review also covers an overview of the SAP enterprise resource planning modules used in this study which are; Sales and Distribution, Materials Management, Production Planning, Financial Accounting and Controlling.

The practical phase starts first with running the existing scenarios to the SAP system. Once the scenarios are configured they are run once to be able to confirm that they work.

After all the pre-configuring is done, the second part can start. New tests are run in order to be able to identify the desired integrations. After each transaction, status checks are conducted and recorded and all the documents are checked. When all desired configurations are identified they are analyzed for the information they provide.

1.4 Structure of the Study

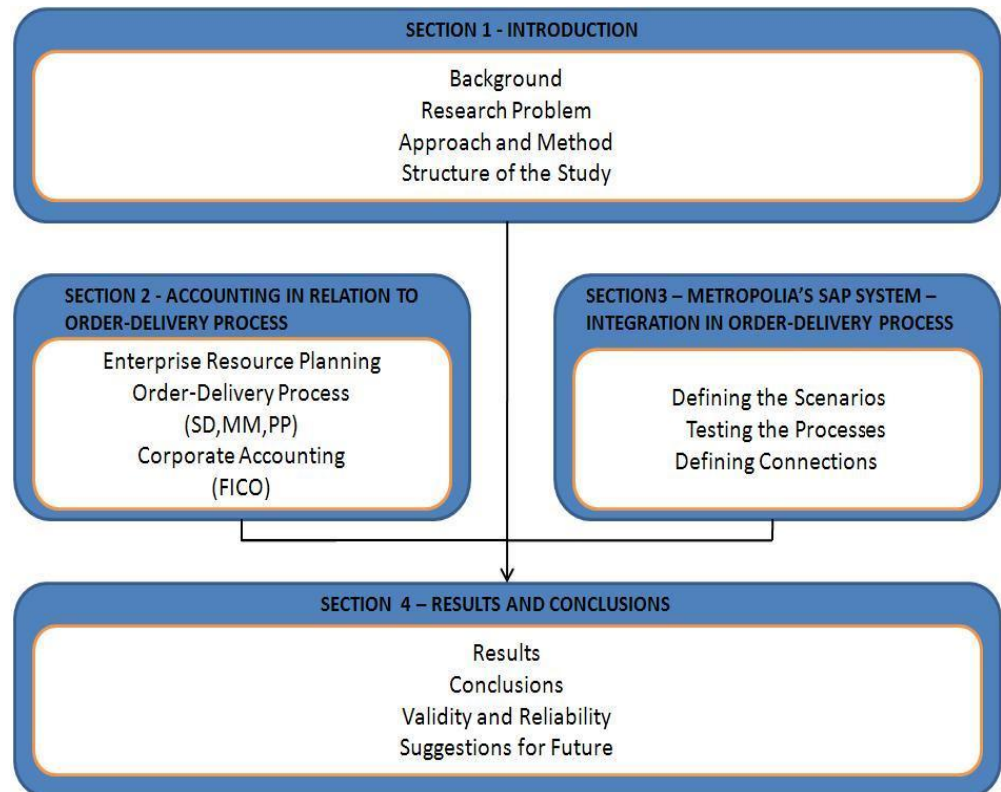The structure of this thesis is described on Figure 3.

Figure 3: The Structure of the Study

Section 1 introduces the study. It describes the background and the means of the study, including the research question, the scope and the structure of the study. It also introduces the approach of the study as well as the methods used. Section 2 is a literature review which begins with a brief overview of Enterprise Resource Planning (ERP). After the introduction of ERP this study takes deeper look into the Order-Delivery Process and to the SAP modules used in this study; Material Management (MM), Sales and Distribution (SD) and Production Planning (PP). Lastly there is an overview of financial aspects, especially SAP Financial Accounting (FI) and Controlling (CO) modules in section 2.

The scenarios of the Order-Delivery Process used in this study are created in section 3. After the scenarios are created the FICO integrations are determined and described by conducting test runs. This section reveals where the integrations are in the SAP system as well as how the information

gained from these findings can be used. The test runs are documented in this section, step by step, for further use.

The results gained from the test runs are analyzed in section 4. It gathers up and concludes the study. It also provides an overview of the reliability and validity of the study as well as provides suggestions for the future actions.

2   ACCOUNTING IN RELATION TO ORDER-DELIVERY PROCESS

This section introduces the theoretical background of the study. Theory consists of the overview to enterprise resource planning (ERP) and ERP systems, theory of an order-delivery process in general, accounting and SAP software modules used in the study.

2.1   Enterprise Resource Planning

To be able to completely understand the order-delivery process and its connections with accounting data, in relation to enterprise resource planning (ERP), it is good to understand the basics of the ERP and ERP systems themselves.

ERP can be defined as an order-delivery process, to be precise, plan and control its different tasks and operations. However, it can be understood as a production tool only, but it is not. Other functions are needed as well, in order to operate the company's processes. ERP can cover functions from many operations; sales, distribution, product planning and procurement controlling.

Operations in a company are complex unit that consist from separate sub-functions and tasks. Guiding is planning, decision making, realization and controlling related to various operations. Hundreds of tasks related to planning, producing and material handling takes place in companies on daily basis. Main goal for ERP is to help company to achieve their goal set for their production by organizing and guiding their operations. (Haverila et al. 2005: 397.)

 The central principles behind ERP can be presented in four points:

- Capacity's high productivity
- Minimizing inventory
- Delivery accuracy
- Production breakthrough time.

Capacity's high productivity means capital productivity, including production equipments, machines and production premises, is better with the largest

production possible. The production batch is planned to use all the important resources as efficient as possible.

Minimizing inventory is essential because inventory is a notable share of company's capital. Production and material management needs to be planned the way that raw material, unfinished goods and end product warehouse has the little as possible capital value.

Delivery accuracy means on-time delivery to customer and it is important for company as well as readiness to product supply on customer need.

Production has to be planned in a manner to have short breakthrough time for orders and production batches. Short breakthrough time cuts down capital tied to semi-finished production; improve supply reliability and quality, and makes capacity planning easier. (Haverila et al. 2005: 402.)

ERP processes are often unique due to historical reasons. Different systems have been developing from different point of view at different times. Because of that, different ERP systems can vary on their structure and functioning between different companies. (Haverila et al. 2005: 410.)

ERP Systems

ERP system is a tool for a company to manage its financial, human and material resource transactions within the boundaries of a single organization. Typical ERP system is built from modules that cross functional and departmental boundaries. Typical modules included into ERP system are order and inventory processing, accounting, financial payments and human resources. Data gathered from operations can be stored into databases for analyzing and reporting. (Scharay - Skjott-Larsen 2002: 301.)

Central idea behind ERP system advanced integration between data processing and ERP. This allows user to create master data i.e. once data is given once to the system, it is usable for everyone for there on and not needed to be created again. Information technology integration allows all the users within system, locally and globally, to use all the data entered.

Integrating ERP is other way stating how ERP system can be used for effective managing of all the company resources and production plants as well as centrally plan business and production execution. Integrated

information technology allows observing and managing different operations. Centralized systems make key figures, reports and expense information easily accessible. (Haverila et al. 2005: 430.)

Table 1 concludes the main tasks of an ERP system.

Table 1: ERP system in a nutshell

ERP System tasks:

- **maintaining basic information**
- **managing action records**
- **connecting information within a company**
- **draw up and manage plans**
- **gather and manage fulfillment information**
- **produce documents**
- **compile statistics and reports**

There are many software houses making their own ERP systems. There is not a lot of difference between the basic ideas and functions between them (Haverila et al. 2005: 432). Later on this study ERP system references to SAP-made software and the case part of the study is conducted in SAP environment.

2.2 Order-Delivery Process

Order-delivery process can be defined as follows:

> Order-delivery process starts from a customer. Demand based information flows will go through many responsibility areas within the company. Item flows from suppliers are moving to opposite direction and end up reaching the end customer. (Sakki 1999.)

First, before going into deeper detail on order-delivery process, it is good to define process itself.

Consecutively performed actions are called process. Process is series of occurring or executable actions, following with a result. Process can be understood as an action or an execution that can be similarly repeated over and over again. Conducting different phases of an order-delivery process

within a company, can involve personnel from many different responsibility areas. (Sakki 2009: 15.)

Order-delivery process itself has been similar for last couple hundred years. Order-delivery process can include many different phases and yet all of them can be re-created or even skipped entirely. Figure 4 is based on the basic idea of different phases of an order-delivery process, based on Jouni Sakki (Sakki 1999: 190).
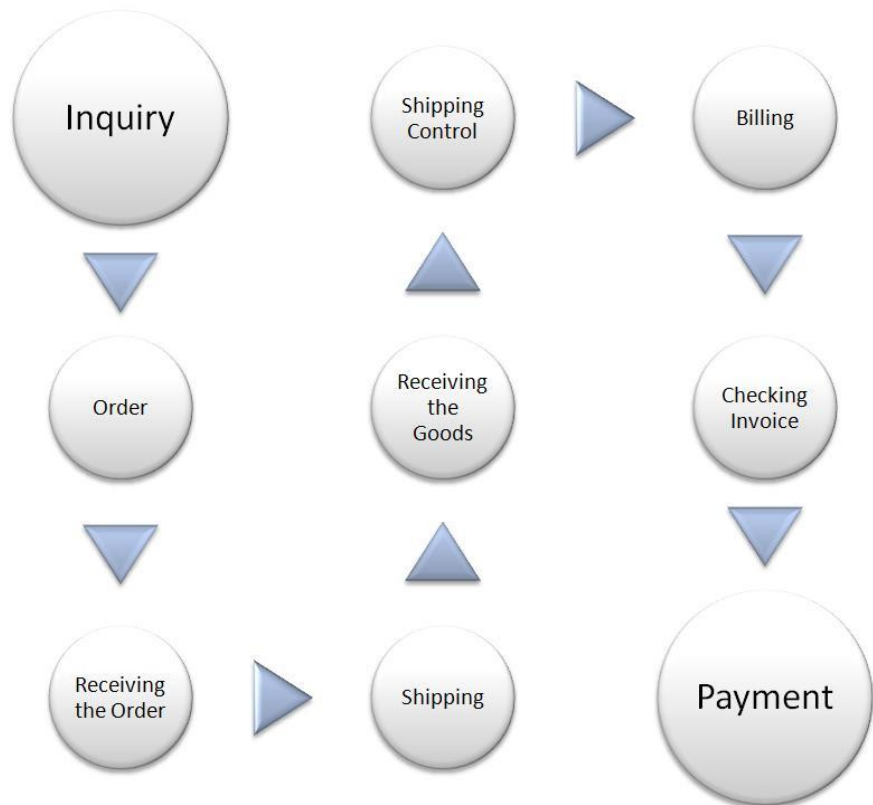

Figure 4: Order-delivery process

As shown in Figure 4, the order-delivery process starts with *inquiry* or *quotation*. At this stage a company uses its own order system either for placing an order or making inquiries to potential vendors and then comparing the offers they get. This is time consuming process and it is not practical to do this every time all over again, instead of that, it is a sensible idea to agree on bigger contracts.

Order process has traditionally been done by a buyer. Nowadays it is possible to do that in two other ways as well. Order can be done, either as a so called homeward call or even a vendor can do the follow up for the goods that the customer needs and do the delivery on their own.

The vendor will *receive the order* and fill that information to its own order system. It is used to control i.e. production, stock and delivery. However, nowadays customer can register their order straight to the vendors system. (Sakki 1999: 190.)

When goods are ready for *shipping*, vendor or vendor's ERP system creates all necessary documents, goods are packed and transferred to delivery. When a customer *receives the goods* ordered from the vendor, it checks the condition of the goods received, information on the goods arrival will be recorded in their system and the goods are transferred to desired location, usually workstation or warehouse. *Shipping control* does not add any value to the process anymore.

Billing can be executed in two ways. Either the traditional way, where vendors system creates and sends the bill regarding to the order, or billing is done automatically within both parties systems, right after order and receiving the order has occurred. Customer checks that the billing is done according to the order and receives information. Checking can be done automatically within the system. *Payment* will be done automatically, through bank, within the information systems. (Sakki 1999: 191.)

The above was a general overview of an order-delivery process and how it works. Next three sub-sections are brief overviews about modules which form order-delivery process in SAP ERP system. These following modules are used in the practical phase of this study.

2.2.1 Sales and Distribution (SD)

Sales and Distribution (SD) is a module in SAP system that operates functions from product inquiries to order delivery and invoicing the customer, and everything between. SD is also integrated with Materials Management (MM) and Financial Accounting (FI) modules. Integration with MM automatically launches a purchase requisition in Purchasing when a sales order appears to contain third party items. FI integration starts immediately after sales organizations and plants are signed. The Sales and Distribution Processing and the relationships to the other modules are shown in Figure 5. (SAP AG SD 1996: 1.10 – 1.12.)
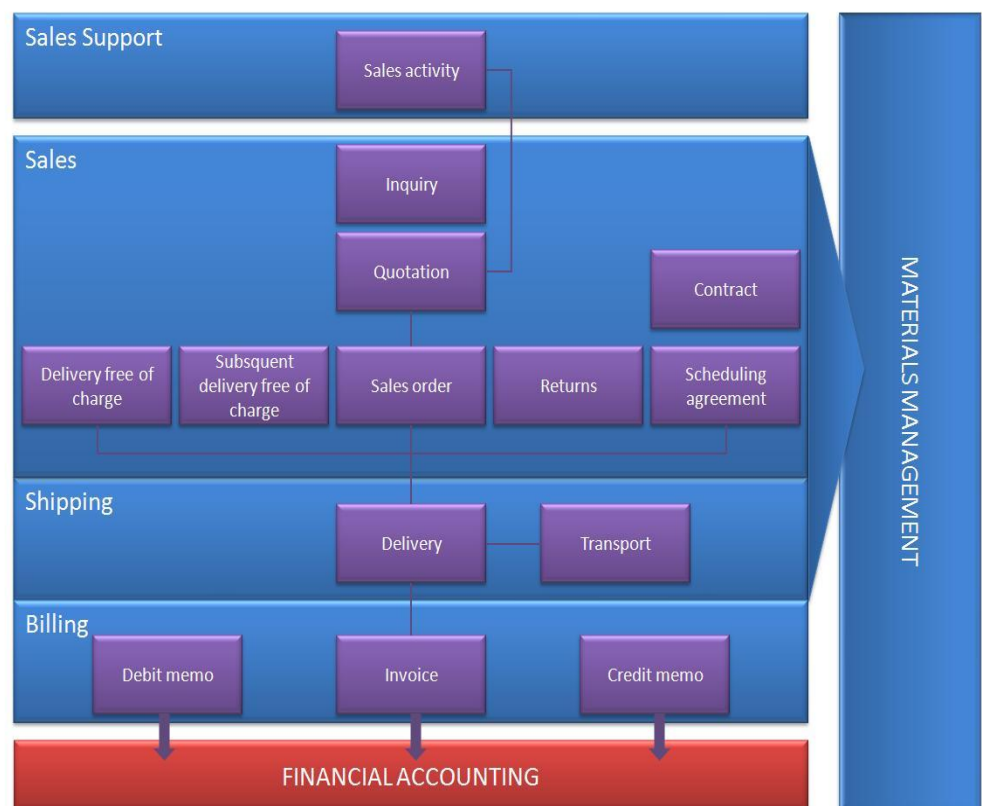

Figure 5: Sales and Distribution (SAP AG SD 1996: 1.10)

As shown in Figure 5, SD module consists of three main components sales, shipping and billing and one supportive component, sales support. Brief overview of the central points of these components is presented next.

Sales Support

The sales support component offers tools and processes for sales and marketing personnel as well as customer service. It links closely to other SD

components; sales, shipping and billing. Using sales support gives valuable information about customers, sales prospects, competitors and their products, as well as contacts. (SAP AG SD 1996: 4.2.)

Sales

The sales department can face many different activities on its operations. Activities such as; processing request for quotations (RFQs), quotations and sales orders or pricing, credit and product availability. Taking care of these steps can be crucial when pursuing towards good customer relationship. (SAP AG SD 1996: 5.1.)

Inquiry and quotation documents are used in per-sale processes and as storage for this business data. Inquiries are used when a customer requests information on products or services. When sales take place, it is fast and easy to move information from inquiries and quotations to the sales documents. SD module offers a range of tools for managing and monitoring these documents, analyzing pre-sales documents and lost sales, and help on building a basis for planning and strategy. (SAP AG SD 1996: 5.2.)

Sales orders can be processed many ways. Many items can be ordered at the same time or more complex order can be placed by using expand order options. SD gives automatic proposition for appropriate data already existing in product and customer master records. (SAP AG SD 1996: 5.4.)

Other than just a regular order, the system also has two types of long-term sales agreements, contracts and scheduling agreements. In contracts, quantities and prices can be specified for customer needs, while scheduling agreements specifies delivery dates and quantities. As a part of delivery scheduling is performed availability check. Availability check determines whether products are available to be delivered to a customer on requested date. This function can be also used for checking information on stock levels, identified delivery bottlenecks, improving on-time business processing, transfer requirements for Materials Requirements Planning (MRP) and improved customer service. (SAP AG SD 1996: 5.8 – 5.13.)

Shipping

Shipping is a central part of the supply chain and important part of customer service. Shipping causes major part of logistics costs which mean by optimizing shipping process can lower company's overall costs and increase competitiveness. (SAP AG SD 1996: 6.1.)

Within shipping process, delivery is the object that gives support to it by providing planning information, tracking the status of shipping activities and capturing data generated during the shipping process. All the data needed for the whole shipping process is stored in delivery. To make sure, that promised delivery dates can be met, is ensured by backward scheduling. (SAP AG SD 1996: 6.2 – 6.4.)

From the shipping point of view the business transaction completed at the point the goods leave the premises. In the SD system this phase is know as posting goods issue for a delivery. After goods issue has taken place the delivery is due for billing. Post goods issue impacts on many levels in the SAP system i.e. reduced inventory is reflected in financial accounting and general ledger by evaluating and updating relevant balance sheet accounts, material requirements for the delivery is reduced and delivery status is updated. (SAP AG SD 1996: 6.11.)

Other big part of shipping is transportation. Shipments to leave on time and reaching the customer on schedule are principal aims for transportation. Increasing efficiency of transportation planning and processing helps company to keep major costs down which can mirror to the price of the end product significantly. (SAP AG SD 1996: 7.1 – 7.6.)

Billing

Each sales activity ends with billing. Billing function is fully integrated within the SD module but also to the Financial Accounting (FI) and Controlling (CO) modules. (SAP AG SD 1996: 9.1.)

This section concluded the Sales and Distribution module. It was an overal review to the functions of the module and introduction to the next section about Materials Management.

2.2.2   Materials Management (MM)

Materials Management (MM) module is used on day-to-day business operations. Wide-ranging and conflicting demands are set to MM module due to; industry-specific requirements, product-specific features and company policy involving factors. (SAP AG MM 1998: 1.1.)

MM module includes transactions and functions such as Materials requirements planning, Material procurement, Inventory management, Invoice verification, Material valuation and External services management.

MM module, together with other SAP modules like Production Planning and Warehouse Management, provides the basis for Materials Requirements Planning (MRP). MRP can be used to generate procurement proposals in two different ways; reorder point principle or using forecasts. Additional requirements can be addressed to purchasing department. This way quantity will be right and level of service is secured. (SAP AG MM 1998: 1.2.)

> "The main function of MRP is to monitor stocks and automatically generate order proposals for the purchase department. This is achieved by implementing various requirements planning methods." (SAP AG MM 1998: 4.1.)

Material procurement function is used by purchasing to optimize relevant work processes, ranging from creating purchase requisitions to purchase order printouts and longer term purchase agreements. Also the system provides information for; vendor evaluations and selections, volumes regarding the material or vendor, and monitoring order activities. Additional functions are available for buyers and material planners to obtain information from; stock level and availability, vendors purchase order history, delivery dates and open-order quantities. (SAP AG MM 1998:1.3.)

Inventory management function is a function that handles transactions that cause changes in stock levels within MM module. Typical transactions that lead to changes in stock levels can include; goods receipt, return deliveries, planned and unplanned stock withdrawals, stock transfer, reservations and stock adjustments. When a goods movement is posted also causes stock value updates, which affect to other applications e.g. automatic postings to General Ledger (G/L) accounts in General Accounting. (SAP AG MM 1998: 1.3, 6.1.)

The degree of integration comes up clearly in the invoice verification function. It provides the link between the MM and Financial Accounting, Controlling, and Fixed Assets Management (SAP AG MM 1998: 8.1.) It gets its information straight from the material master record, the purchase order and goods receipts. In the ideal case, user enters only the total for the items on the purchase order. Also if the total matches the pre-planned values, all the postings are affected and the invoice is released, or cleared, for payment. In case the pre-set tolerance levels are exceeding, e.g. quantity, price, delivery date, payment of the incoming invoice is blocked. (SAP AG MM 1998: 1.3.)

Basic Data

Various kinds of basic data are behind all the processes of materials management. MM basic data includes:

- Vendor
- Material
- Batches
- Purchasing Info Records
- Bill of Material
- Classification
- Conditions.

The same vendor record is used by both materials management and accounts payable. MM references to the vendor master record for purchasing whereas financial accounting uses the same records for its own purposes. All the information about one vendor is stored in vendor master records which are all identified by individual number. Vendor record consists of; general data including important contact information, purchasing data about pricing and deliveries, and accounting data with vendors' bank details and payment transactions. (SAP AG MM 1998: 3.1 – 3.2.)

The material master is central location containing all the information about all the materials possessed within a company, from procured materials to sold materials. Same material data is used by all modules in the SAP Logistics System. Material master can contain a huge number of different kinds of material, each uniquely identified by a material number. (SAP AG MM 1998: 3.3 – 3.4.)

Batch management is mainly used within few industry sectors. However, it is integrated with all areas of logistics and can be used by all industry sectors. A batch is a quantity of a material produced in one production process. (SAP AG MM 1998: 3.6.)

Purchasing info records contains the information between a vendor and a material or service. This source of information is for purchasing and is used for; monitoring which material a certain vendor has supplied or which vendors have supplied a certain material, also it allows purchasing to do price simulations on materials and services. (SAP AG MM 1998: 3.7 - 3.8.)

Bill of material (BOM) is a way of describing product structures; it is like recipe or ingredient list. Material BOMs and sales order BOMs are especially relevant for MM. Different areas within the company needs to have their own BOM for the same product for the data to be specific for their activities. Each BOM is like a different view of the same product. (SAP AG MM 1998: 3.9.)

Classification is tool to categorize master data in order to make it easier to find in the system.

Conditions are pricing instrument for purchasing. It contains information about prices, surcharges and discounts. (SAP AG MM 1998: 3.11 – 3.13.)

This section concluded the Materials Management module. It was an overal review to the functions of the module and introduction to the next section about Production Planning.

2.2.3   Production Planning (PP)

Production Planning (PP) module is used on various stages on company's production. It handles master data including; bill of material, routings and work centers, and enables to handle these within one separate component (SAP Documents 2009). PP module is divided into two separate sub-modules; Production General and PP Process Industries, which is mainly used in the chemical, pharmaceutical or food and beverage industries. (SAP AG PP 1996: 2.1.)

Brief overview to the master data used in PP module is useful to give more depth to the subject. Information on bill of materials (BOM) can be found on the previous subtitle. Routing is a set of sequenced operations, where each

of the operations defines how to proceed step by step in production process (Big4Guy 2009). Work centers are business objects where operations are carried out. The real work centers are; employees, machines, groups of employees and machines, production lines and assembly work centers, units that have capacity to do work. Work centers are used for scheduling, costing, capacity planning and simplifying operation maintenance. (SAP SCM Planning 2009.)

Integration to other modules e.g. Materials Management (MM), Financial Accounting (FI) and Sales and Distribution (SD) increases reliability of PP module. PP module operates in real time, which enables production controller to react fast to changes in demand and supply. (SAP Documents 2009.)

Various planning strategies can be carried out with the system, e.g. make-to-stock, make-to-order and planning without final assembly. (SAP Documents 2009.)

This section concluded the main principles of Production Planning module.

2.3 Corporate Accounting

Economy forms an important part of company operations. Company economy can be seen divided into two parts; Corporate Accounting and Corporate Finance. For this study it is relevant just to concentrate to the Corporate Accounting and its two main levels; Financial Accounting and Management Accounting. (Haverila et al. 2005: 123 - 124.)

Main information gained from Financial Accounting is external on its nature and also required by law. Information can be such as; official closing of the books and official tax return based on it. In addition can be mentioned reports made for public statistics. Management Accounting on the other hand, concentrates on guiding company's financial operations internally. Typical information produced by Management Accounting is budget, investment calculations, product specific cost analysis, pricing calculations and other financial comparisons. (Haverila et al. 2005: 124.)

This traditional division of corporate accounting is spread out in Figure 6.

	Calculation type	Name of the calculation	Purpose of the calculation
Management accounting	Assistive calcultion for planning	Alternative calculation	Selecting
			ERP
	Assistive calculation for controlling	Observation calculation	
Financial accounting	Assistive calcultion for informing	Informing calculation	Infulencing surroundingss
			Statistics
	Assitive calcultaion for profit dividing	Profit sharing calcultaion	Profit sharing

Figure 6: Accounting types (Haverila et al. 2005: 124)

Starting from the top of the left column of the Figure 6 is Management Accounting. There are two types of assistive calculation in Management Accounting, for planning and controlling. Purpose for planning calculations is information gained for selection and enterprise resource planning. Information for selection is important if there are several options for a company to go for, from economical point of view. Controlling type of calculations is used for ERP as well. The results gained from controlling help observe if some actions are needed.

Financial Accounting is illustrated at the bottom part of the Figure 6. Information types gained is pretty straight forward. Information is to help informing the stakeholders and authorities as well as information for profit sharing. (Haverila et al. 2005: 124 - 125.)

As a concept, accounting is really wide spread and it can be seen as an important tool for management and its information systems. Accounting or

some parts of it can be integrated as a part of enterprise resource planning systems. (Haverila et al. 2005: 123 - 125.)

The above was a general overview of accounting and its functions. Next two sub-sections are brief overview about modules which are called FICO in SAP ERP system. FICO stands for Financial Accounting (FI) and Controlling (CO). Financial Accounting deals what it is named after, financial accounting, whereas Controlling is about management accounting. The following modules are used in the practical phase of this study.

2.3.1 Financial Accounting (FI)

The Financial Accounting (FI) module is the central module within the financial applications. FI module provides financial information from an external point of view (SAPdocs.info 2009). FI module offers real time information on financial position of the company for managers to review when needed. This enables possibilities for better decision making and planning. (TheSpot4SAP.com 2009a.)

Deeper look into Financial Accounting sub-modules gives a better understanding of the FI module capabilities. The components include the following:

- Accounts Receivable
- Accounts Payable
- Asset Accounting
- Bank Accounting
- Consolidation
- Funds Management
- General Ledger
- Special Purpose Ledger
- Travel Management.

All the account postings generated as a result of sales activities are recorded in *Accounts Receivable* (AR). General Ledger will receive posting updates automatically from AR. In addition to General Ledger, the AR module is integrated with Sales and Distribution and Cash Management modules. (TheSpot4SAP.com 2009a.)

All the account postings generated as a result of purchasing activities are recorded in *Accounts Payable* (AP). General Ledger will receive posting updates automatically from AP as well. (TheSpot4SAP.com 2009a.)

Asset Accounting is available for managing company's fixed assets whereas *Bank Accounting* is used for bank transactions, including cash management. (TheSpot4SAP.com 2009a.)

Consolidation can be used for combining financial statements for several entities in an organization. These statements give an overview of the financial state of the company as a whole. (TheSpot4SAP.com 2009a.)

Funds management presents an overview of the planned revenues and expenses for the management areas, controls these transactions and compares them to available funds and prevents exceeding the budget. (SAPdocs.info 2009)

The chart of accounts, account balances and line items are located in the *General Ledger* (G/L). All account postings are recorded within the G/L and to ensure up-to-date visibility of the financial accounts these postings are displayed in real-time. (SAPdocs.info 2009.)

The *Special Purpose Ledger* is functionality for creating other ledgers or sub ledgers for specific user requirements for reporting purposes. It can get access to information from other modules and support simplistic allocations. (SAPdocs.info 2009.)

Travel management combines all the information on travel expenses for managerial use. (TheSpot4SAP.com 2009a.)

2.3.2   *Controlling (CO)*

Controlling (CO) module is a source of information for management to use as supportive information for planning, reporting and monitoring their business operations (TheSpot4SAP.com 2009b.) CO module can be seen as a symbiotic counter to the FI module. CO is used as a source of financial information from an internal managerial accounting view. (SAPdocs.info 2009.)

A deeper look into some of the Controlling components gives a better understanding of the CO module capabilities. The components are as follows:

- Cost Element Accounting
- Cost Center Accounting
- Internal Orders
- Product Cost Controlling
- Profit Center Accounting.

The Cost Element Accounting is component that has information about costs and revenue for an organization automatically updated from Financial Accounting component. Cost accounting is based on cost elements. Cost elements can display costs for the accounts assigned to it. For example; cost centers, internal orders and work breakdown structures. (TheSpot4SAP.com 2009b.)

Cost Center Accounting shows the costs company's business has. Independent cost centers can be assigned for different functional areas or departments responsible for certain business areas i.e. marketing, finance, HR etc. (TheSpot4SAP.com 2009b.)

Internal Orders are way to track costs caused by a specific tasks, services or jobs. This kind of detailed monitoring offers management better tools for decision making. (TheSpot4SAP.com 2009b.)

Management can use Product Cost Controlling as a tool for analyzing the cost of their product and decide optimal price range for marketing. This is the module in CO where planned, actual and target values are analyzed. (TheSpot4SAP.com 2009b.)

Profit Center Accounting makes organizations profit and losses visible ranked by profit center. Profit Centers are used for internal purposes, which allow management review responsibility areas within their organization. Profit Centers can be set up to identify i.e. product lines, geographical locations, offices, functions etc. (TheSpot4SAP.com 2009b.)

3   CASE METROPOLIA – INTEGRATION OF ACCOUNTING IN THE ORDER-DELIVERY PROCESS

Locating the integration points between Order-Delivery Process and Financial Accounting and Controlling in a functioning Enterprise Resource Planning System, is conducted by test running scenarios used for teaching order-delivery process in Metropolia University of Applied Sciences. The practice phase of this study is divided into three parts; First, general overview to the scenarios used in the study, second, general plan and guidelines how the test is done, third, description of the execution of the test.

The first step is to introduce and create the order-delivery process scenarios used in the experiment. This should give an overview on how the process is done and how it is used. Since the purpose of this study is to locate the integration points between the order-delivery process and accounting tools, the scenarios are tested and studied for the integrations available.

The second step is to create test plan for determination of the integration points. The test plan gives a guideline how the testing is conducted and makes it transparent and possible to conduct again.

The third step is description of the test execution, step by step.

3.1   Order-Delivery Process

In order to define the integration points between Order-Delivery Process and Financial Accounting and Controlling (FICO), the Order-Delivery Process itself needs to be created. In this study, there are two different scenarios that are created in the SAP system for determining the integration points. These scenarios are used also as a teaching tool for teaching the basics of the Order-Delivery Process. Both of the scenarios are shown in Figure 7 Order-Delivery Process map. Scenario 1 is followed with 1.0 numbering and 2.0 numbering indicates the path of scenario 2.
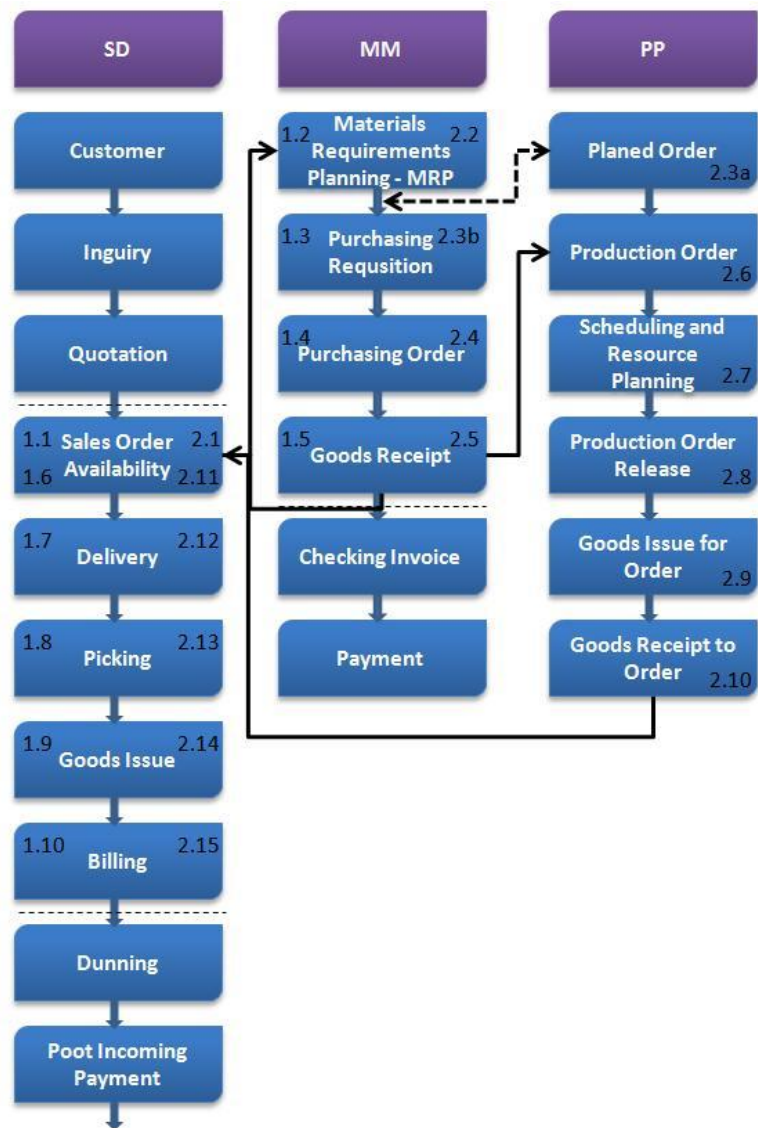
Figure 7: Order-Delivery Process

Since the purpose of this study is to locate the integration points between the order-delivery process and FICO and concentrate on the information value that can be gained from them, it is not necessary to explain in detail how the master data used in these scenarios is to be done. Master data on organizational units is predefined before student logs in to the system. Customer and vendor data as well as price lists, discounts, tax and pricing procedures will be created by a student. Student also copies the used material data from an existing material. In scenario 2, bill of material is configured by the student and routings are created by copying existing one.

The first scenario is about customer order and delivery. It starts with the order, proceeds with stock check and purchase of needed materials and ends with the customer delivery and billing.

The second scenario is similar to the first one, main difference is that the product customer ordered, is to be put together from different materials and produced before the delivery can take place. To make it easier to follow the process on the map shown in Figure 7, map numbering is running within the text.

3.1.1 Scenario 1

Scenario 1 starts with creation of a sales order in Sales and Distribution module. All the necessary information e.g. sold-to party (customer number), material and quantity are set here. This follows with availability check for the good ordered (1.1). Since the stock is empty, standard order needs to be created. After the order is created, user can check dates affecting the delivery date e.g. date for goods issue, loading and material availability date.

The next step is materials requirements planning (MRP) run for the ordered material. This step takes the process to Material Master module (1.2). This action creates purchase request for the material (1.3). MRP can be processed manually or automatically, in this case it is done automatically. At the same time the purchase request is created, stock status will get updated to respond the current situation. After the purchase request is done it has to be turned into a purchase order (1.4). Yet again the stock status has changed.

Now the vendor has delivered the ordered material to the stock. In order to get receipt of the vendor delivery to the stock, transaction called *MIGO* for goods receipt has to be performed (1.5). Yet again the stock status has changed. Accounting documents have also been created and they are available for the permitted users.

In the next step the sales order is delivered to the customer. Now the process has returned back to SD module. First user performs item availability check which follows with activation of the delivery completion (1.6). After that, delivery of the sales order has to be made and system creates a delivery number (1.7).

Now the item is ready to be picked (1.8) for the delivery after posting goods issue document to release the delivery picked from the stock. Now the system confirms that the delivery is saved (1.9).

Document flow about the sales order is now available for the user to see. This includes material and accounting documents created by the order.

The last step to finish the order-delivery process is billing the customer (1.10). The billing document is composed based on the sales order. Then the bill is ready to be recorded for accounting. Now all documents related to the order are available for the user to see.

3.1.2   Scenario 2

As already mentioned, the second scenario is similar to the first one in many ways. Process is similar till MRP run is done (2.1, 2.2). The only difference to the first scenario is the ordered product. In scenario 2, the product has to be assembled from two parts of material (2.3a). After MRP run is conducted and all necessary material is in stock (2.3b, 2.4, 2.5), scenario 2 is taken to the Production Planning module.

Now, the main product production is started by converting the planned order to a production order (2.6). Scheduling and resource planning is performed (2.7). After this is done, the order must be released (2.8). Now the amount of the manufactured main product can be confirmed (2.9, 2.10).

Now, the process has come back to the SD module and the customer delivery can be conducted (2.11, 2.12, 2.13, 2.14, 2.15, 2.16).

3.2   Plan for the Test Run

The test plan is done for the author to be able to conduct the test with the most dependable and traceable manner. The plan gives guidelines on how the test has to be done. The test can be divided into two parts, which are repeated as many times as needed, to get accurate results.

1. Processing the scenario

2. Analyzing the findings.

In the first part, processing the scenario, the scenario is run following the order-delivery process map shown in Figure 7, like described earlier in Sections 3.1.1 and 3.1.2. Every time new action is taken and saved in the system, stock status, accounting documents for material in Inventory

Management and sales order document flow are checked for changes. Every time when change occurs, new status is recorded as a screen shot.

The findings are analyzed for the changes and description of each change is written down to explain the new status.

These two steps are repeated as many times as needed in order to secure accurate results.

3.3 Process Testing

Testing is conducted by running the scenarios trough; starting from a customer order and ending to invoicing the customer. All the master data sheets used were created already when the scenarios were tested. In scenario 1 the customer orders material that needs to be ordered from a third party before it can be delivered. Scenario 2 is similar to the first one, difference is that the customer orders product that has to be manufactured from two different materials. These materials are ordered from a third party, following with production and customer delivery of the finished product. Master data for the material used in scenario 1 is referred as a material in the text, in the system the material name is janne01. Master data for the materials used in scenario 2 are in the text referred as material 1 (janne01, same name than in scenario 1 material had), material 2 (janne02) and main product (janne03)

To make it easier to follow the process on the map shown in Figure 7, map numbering is running within the text.

Scenario 1

The test starts by creating a sales order for material, but before the creation of the sales order the stock status check is done. Status check confirms that the stock is currently empty as shown in Figure 8.

Figure 8: Stock status when starting Scenario 1

After checking stock status the sales order is created. (1.1) Stock status is showing the amount of goods ordered.

The ordered material is now processed with Materials Requirements Planning (MRP). (1.2) First the MRP run turns stock status from ordered to purchase request (1.3). Then purchase request has to be transferred to purchase order, the same change also takes place in stock (1.4).

After the purchase order is saved the ordered material can be received to the stock from the vendor (1.5). This will update the stock status and material is registered as available in company's system as shown in Figure 9.

Figure 9: Stock status after good receipt

The goods receipt is recorded as an increase in stock value and as a debit record at the management accounting.

A goods receipt caused actions also at the Financial Accounting. Material document was created and Financial Accounting update information can be viewed from it, as shown in Figure 10.

Figure 10: Accounting document after goods receipt

From the accounting document for good receipt can be seen that General Ledger Account for trading goods (310000) has 50 EUR debit record whereas General Ledger Account for Goods Received/ Invoice Received (third party) (191100) has 50 EUR credit record.

At this phase the goods are ready for delivery (1.6). Sales order can be now activated to complete delivery, and delivery can be created (1.7). Once delivery is created it is ready for picking (1.8). Now Goods Issue document is posted to release the picked delivery from the stock (1.9). Changed stock status can be seen in Figure 11.
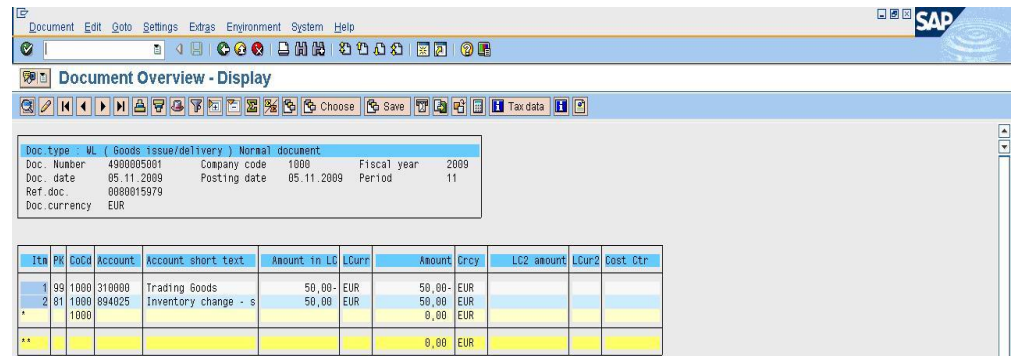
Figure 11: Stock after post goods issue

The goods issue is recorded as a decrease in stock value and as a credit record at the management accounting.

The goods issue caused actions also at the Financial Accounting. Sales order document flow has documents on sales order actions and Financial Accounting update information can be viewed from it, as shown in Figure 12.
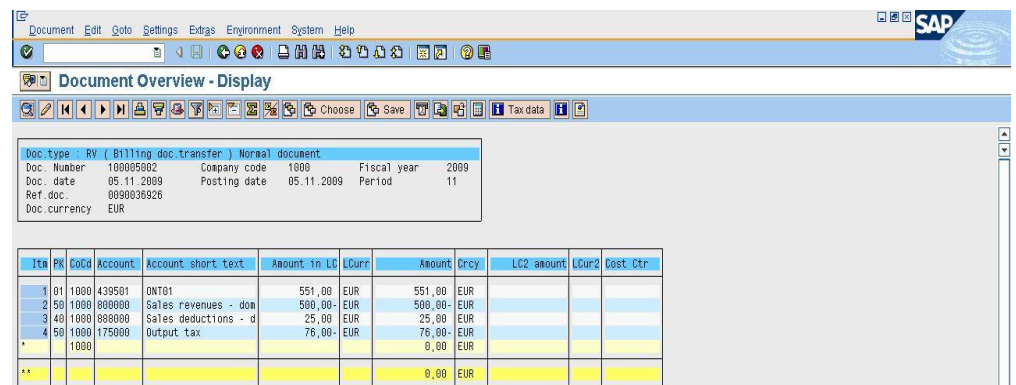
Figure 12: Accounting document after goods issue

From the accounting document for good issue can be seen that General Ledger Account for trading goods (310000) has 50 EUR credit record whereas General Ledger Account for Goods Inventory (894025) change has 50 EUR debit record. Accounts are in balance.

Next step is to bill the customer (1.10). First the billing document (Invoice) is created and after it is saved the invoice can be released for accounting. Now the billing document seen in Figure 13 is available for viewing.

Figure 13: Billing document

From the billing document can be seen that the General Ledger Account for customer payment (140000) has 551 EUR credit record. General Ledger Account for sales revenues (800000) has 500 EUR debit record. General Ledger Account for sales deduction (888000) has 25 EUR credit record and General Ledger Account for output tax (175000) 76 EUR debit record. Accounts are in balance.

Scenario 2

The test starts by creating a sales order for product, but before the creation of the sales order the stock status check is done. Status check confirms that the stock is currently empty as shown in Figure 14

Figure 14: Stock status when starting Scenario 2

After checking stock status sales order is created (2.1). Stock status is showing the amount of goods ordered.

Single-item multi-level MRP run is done for the main product (2.2). The status for the main product is changed to Planned Order (2.3a). Materials used for manufacturing the main product get status Purchase Request (2.3b). Now the purchase requests have to be transferred to purchase orders, the same changes also take place in stock (2.4).

After purchase order is saved, the ordered material can be received to the stock from the vendor (2.5). This will update the stock status and material is registered as available in company system as shown in Figures 15 and 16.

Figure 15: Stock status after goods receipt for material 1

From the accounting document for material 2 for good receipt can be seen that General Ledger Account for trading goods (310000) has 55 EUR debit record whereas General Ledger Account for Goods Received/ Invoice Received (third party) (191100) has 55 EUR credit record.
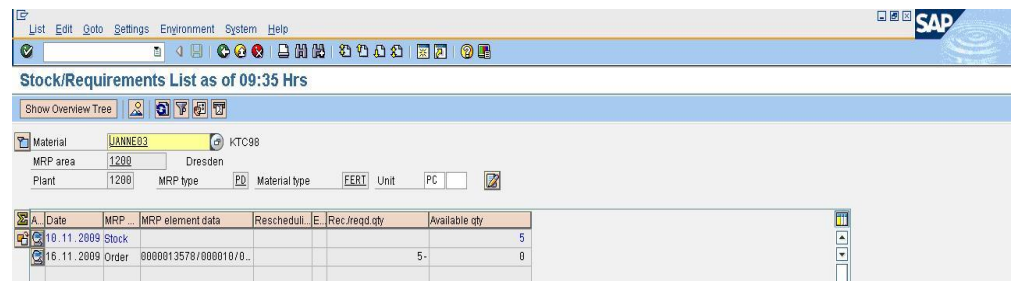
Now the raw material is in the stock. It means that manufacturing can be started by changing planned order to a production order for the main product (2.6). After manufacturing is done (2.7, 2.8) the stock values change for both, the main product and also for the materials used for producing (2.9) the main product (2.10).

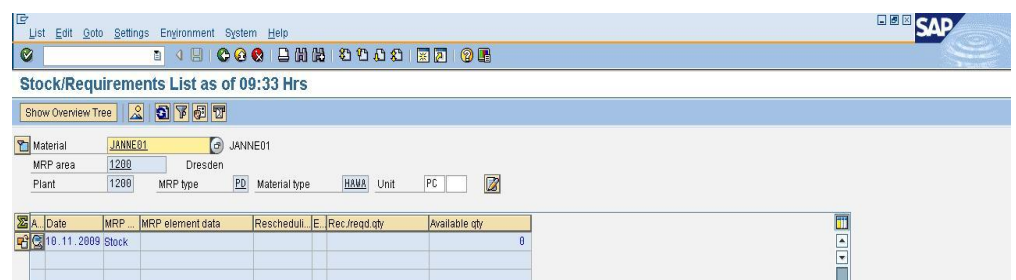New stock status for the main product can be seen in Figure 19.

Figure 19: Stock status goods receipt for main product after manufacturing

Goods receipt is recorded as an increase in stock value and as a debit record at the management accounting. Change in the stock status for the main product can be seen in Figure 19.

New stock status for materials used in manufacturing can be seen in Figures 20 and 21.

Figure 20: Stock status goods issue for material 1

Figure 21: Stock status goods issue for material 2

A change in the stock status for materials 1 and 2 can be seen in Figures 20 and 21.Goods issue is recorded as a decrease in stock value and as a credit record at the management accounting.

Now the goods are ready for delivery (2.11). Sales order can be now activated to complete delivery, and delivery can be created (2.12). Once delivery is created it is ready for picking (2.13). Now Goods Issue document is posted to release the picked delivery from the stock (2.14). The changed stock status can be seen in Figure 22.

Figure 22: Stock after post goods issue

Goods issue is recorded as a decrease in stock value and as a credit record at the management accounting.

Goods issue caused actions also at the Financial Accounting. Sales order document flow has documents on sales order actions and Financial Accounting update information can be viewed from it, as shown in Figure 23.

Figure 23: Accounting document after goods issue

From the accounting document for goods issue can be seen that General Ledger Account for finished goods inventory (792000) has 100 EUR credit record whereas General Ledger Account for Goods Inventory change (893015) has 100 EUR debit record. Accounts are in balance.

Next step is to bill the customer (2.15). First the billing document (Invoice) is created and after it is saved the invoice can be released for accounting. Now the billing document seen in Figure 24 is available for viewing.

Figure 24: Billing document for Accounting

From the billing document can be seen that the General Ledger Account for customer payment (140000) has 1 740 EUR credit record. General Ledger Account for sales revenues (800000) has 1 500 EUR debit record. General Ledger Account for output tax (175000) has 240 EUR debit record. Accounts are in balance.

4   RESULTS AND CONCLUSIONS

In this section the results from the test runs are presented and analyzed. The testing was divided into two test scenarios, which both of them were investigated for Financial Accounting and Management Accounting connections. Both of the test scenarios had many steps in common, which is why the same division, based on scenarios, is not used to analyze the results. Analyzing the results is done in two parts; first from Financial Accounting point of view and then from Management Accounting point of view.

4.1   Financial Accounting Connections in Order-Delivery Process

Based on the test runs, only minor differences can be observed between the two scenarios used, from a Financial Accounting point of view. In both scenarios the integration points were found and located from exactly same points. Only differences found were the destination accounts for the information.

Next there are illustrations of both scenarios separately and an illustration for both of them together. Figure 25 illustrates the connections mirrored from the Order-Delivery Process to the Financial Accounting in scenario 1.
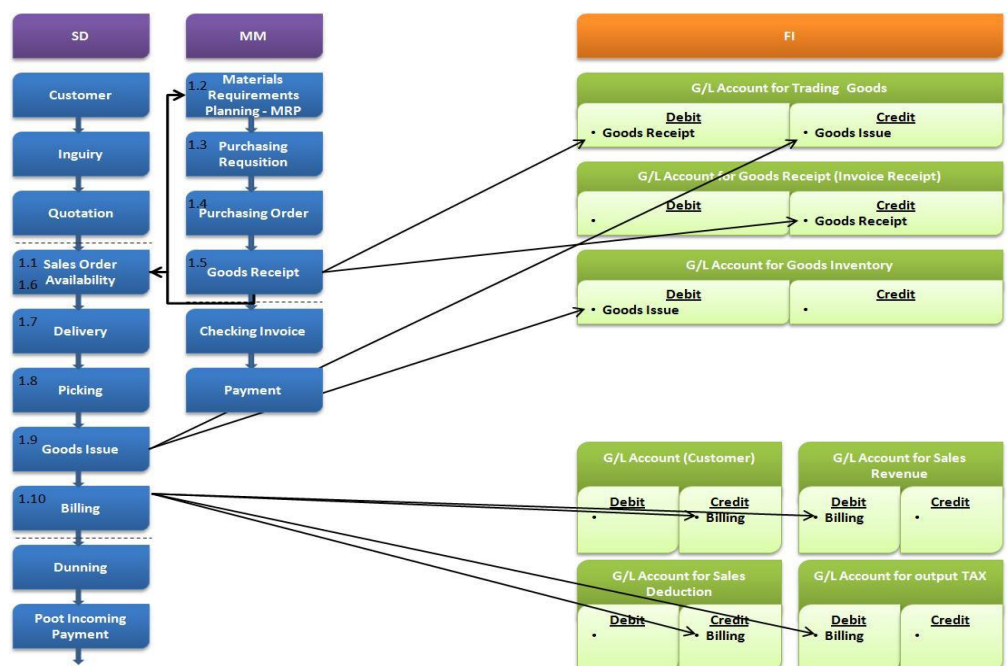

Figure 25: Financial Accounting Connections in Order-Delivery Process Scenario 1

The Order-Delivery Process part of the figure is the same one used to introduce the test scenarios earlier in Figure 7. This updated Figure 25 includes also the Financial Accounting (FI) module and illustrates the connections located between the Order-Delivery Process and Financial Accounting. Running numbering in the figure indicates the order the scenarios are run.

The first connection to the Financial Accounting is found at the step 1.5, Goods Receipt. In step 1.5 the company receives goods from its vendor and this business transaction causes record to company's accounts. The debit record to the general ledger account for trading goods and credit record to general ledger account for goods receipt.

The second connection is the Goods Issue and it is found at step 1.9. At this step the company is delivering ordered goods to the customer and the goods are recorded off from company's stock. This means debit record to general ledger account for goods inventory and credit record to general ledger for trading goods.

The third connection is at the Billing phase, under number 1.10. At billing phase, company sends invoice to its customer. First, general ledger accounts for customer payment and sales deduction are marked with credit records. Customer payment record is caused by payment from the customer whereas sales deduction record is caused by large enough customer order which caused price deduction, determined in material master data. General ledger accounts for sales revenue and output tax are marked with debit records.

Next Figure 26 illustrates the connections mirrored from the Order-Delivery Process to the Financial Accounting in scenario 2.
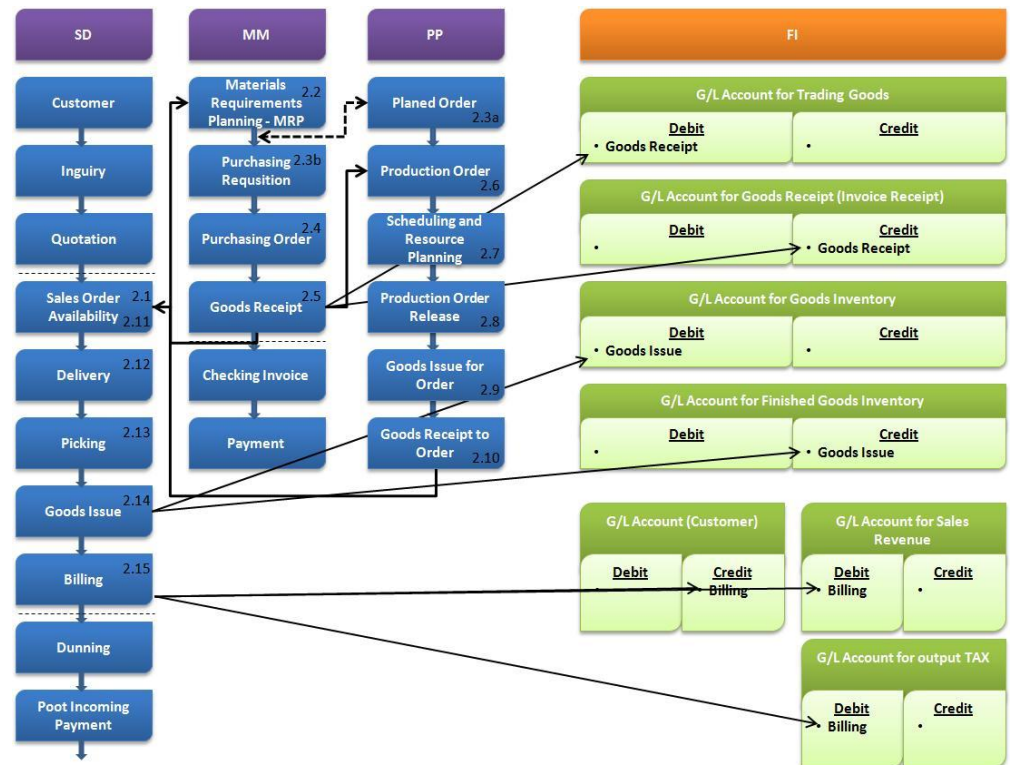

Figure 26: Financial Accounting Connections in Order-Delivery Process Scenario 2

The first connection to the Financial Accounting is found at the step 2.5, Goods Receipt. In step 2.5 the company receives goods from its vendor and this business transaction causes record to company's accounts. Debit record to general ledger account for trading goods and credit record to general ledger account for goods receipt.

The second connection is Goods Issue and it is found at step 2.14. At this step, company is delivering ordered goods to the customer and the goods are recorded off from company's stock. This means debit record to general ledger account for goods inventory and credit record to general ledger for finished goods inventory.

The third connection is at the Billing phase, under number 2.15. At billing phase, company sends invoice to its customer. First, general ledger account for customer payment is marked with credit record. General ledger accounts for sales revenue and output tax are marked with debit records.

Both scenarios are now presented separately, in their own pictures. Figure 27 presents both of the scenarios in one picture and concludes the connections between order-delivery process and financial accounting into one illustration.
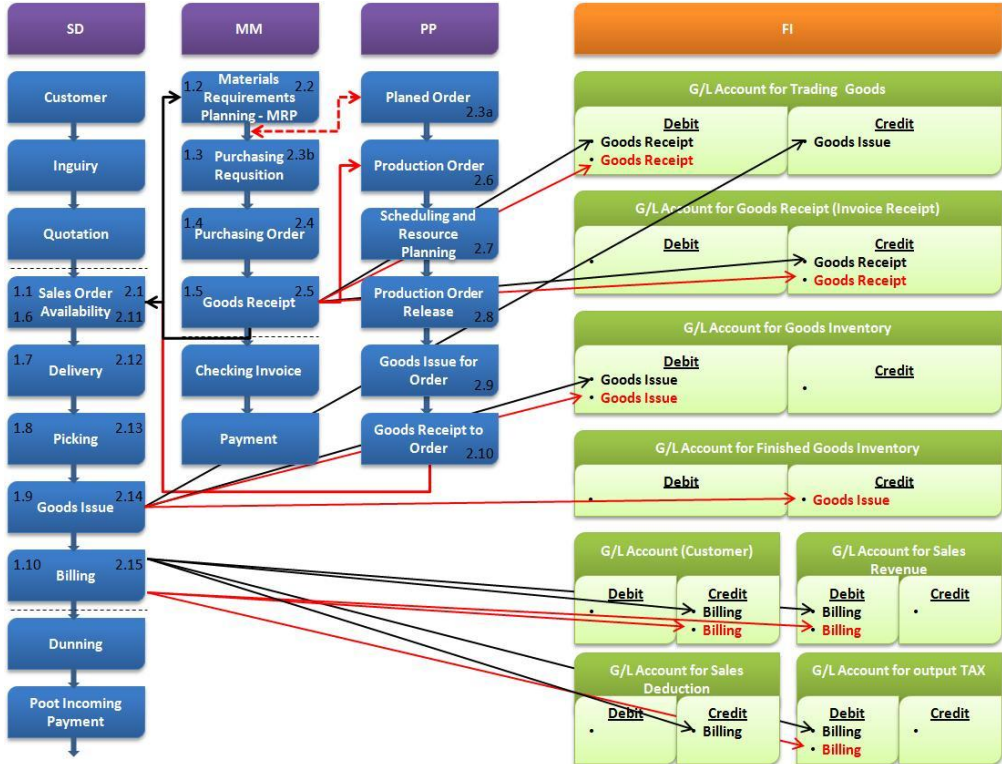

Figure 27: Financial Accounting Connections in Order-Delivery Process

Scenario 1 has its connections and route drawn in black whereas the scenario 2 connections and route are drawn in red, to increase the readability of the figure.

4.2 Management Accounting Connections in Order-Delivery Process

Based on the test runs, some differences can be observed between the two scenarios used, from a Management Accounting point of view. In both scenarios there were integration points found and located from same points. Figure 28 illustrates the connections mirrored from the Order-Delivery Process to the Management Accounting in scenario 1.
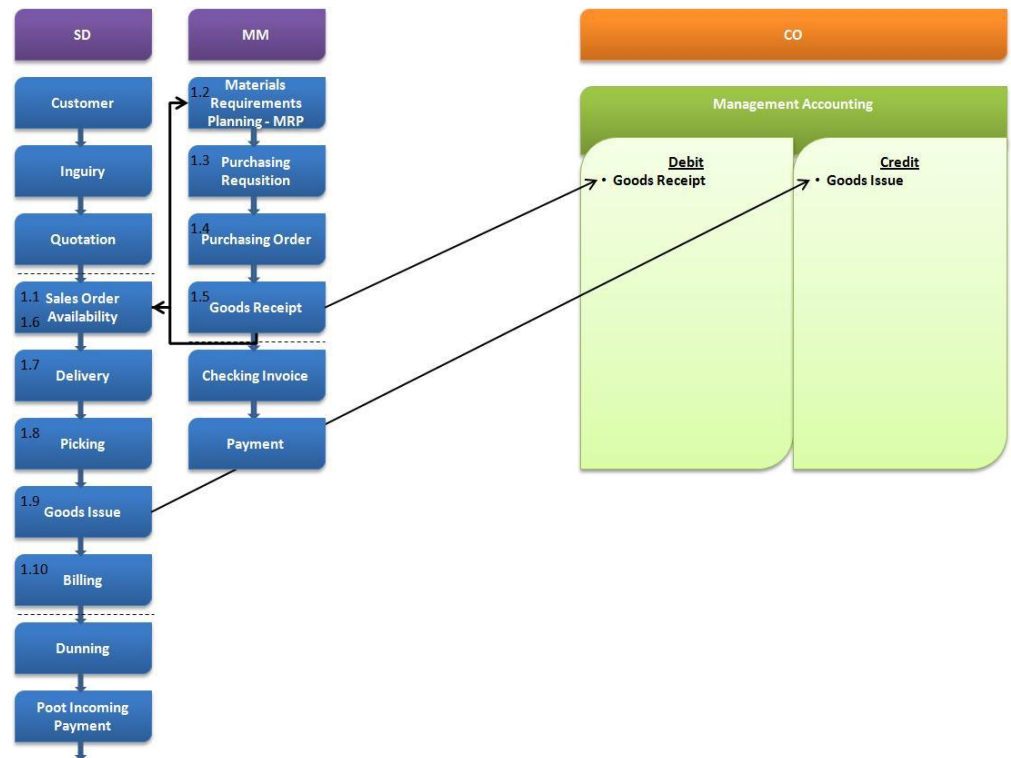

Figure 28: Management Accounting Connections in Order-Delivery Process Scenario 1

The Order-Delivery Process part of the figure is the same one used to introduce the test scenarios earlier in Figure 7. This updated Figure 28 includes also the Management Accounting (CO) module and illustrates the connections located between the Order-Delivery Process and Management Accounting. Running numbering in the figure indicates the order the scenarios are run.

The first connection to the Management Accounting is found at the step 1.5, Goods Receipt. In step five the company receives goods from its vendor and this business transaction causes stock value to change. This business transaction is recorded as a debit entry to the management account.

The second connection is Goods Issue, and it is located at step 1.9. At this step, company is delivering ordered goods to the customer and the goods are recorded off from company's stock. This transaction is recorded as a credit entry to the management account.

Next Figure 26 illustrates the connections mirrored from the Order-Delivery Process to the Financial Accounting in scenario 2.
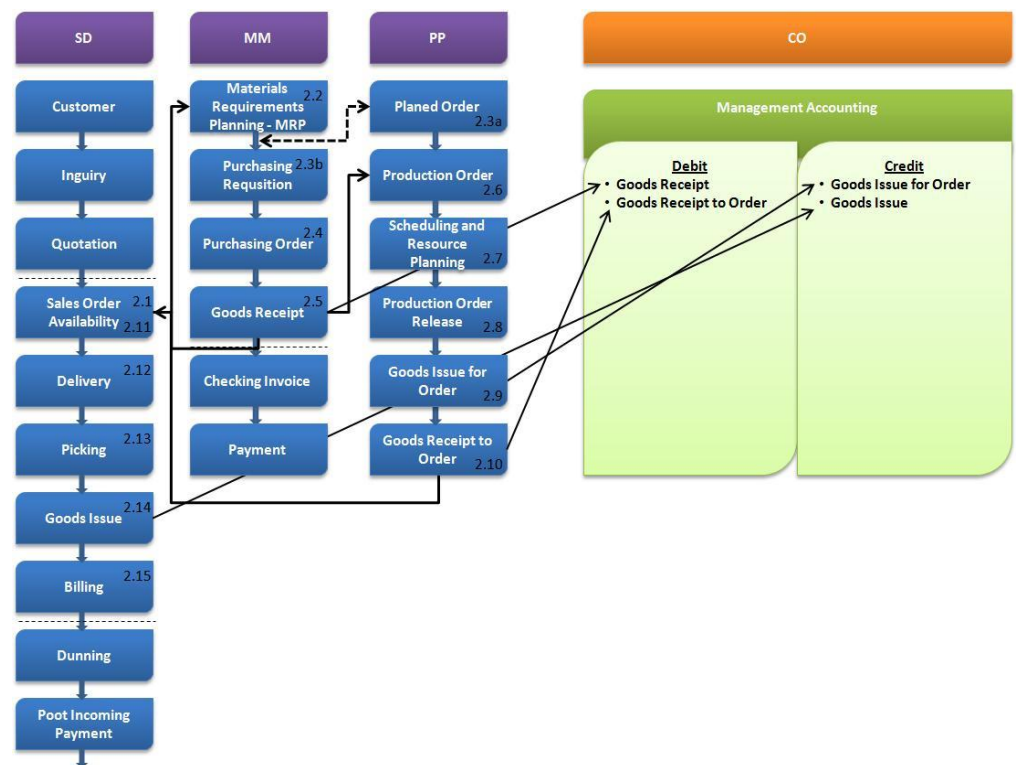

Figure 29: Management Accounting Connections in Order-Delivery Process Scenario 2

The first connection to the Management Accounting is found at the step 2.5, Goods Receipt. In step five the company receives goods from its vendor and this business transaction causes stock value to change. This business transaction is recorded as a debit entry to the management account.

The second connection is at step 2.9, goods issue for order. At this stage raw material is recorded to leave the stock, to be used for manufacturing the main product. This step is recorded as a credit entry to the management accounting

The third connection is found at step 2.10, goods receipt to order. At this stage the main product is manufactured and it is stored to the stock. Stock level increases and debit record is made to the management accounting.

The last connection is Goods Issue, and it is located at step 2.14. At this step, company is delivering ordered goods to the customer and the goods are recorded off from company's stock. This transaction is recorded as a credit entry to the management account.

Both scenarios are now presented separately, in their own pictures. Figure 30 presents both of the scenarios in one picture and concludes the connections between order-delivery process and management accounting into one illustration.
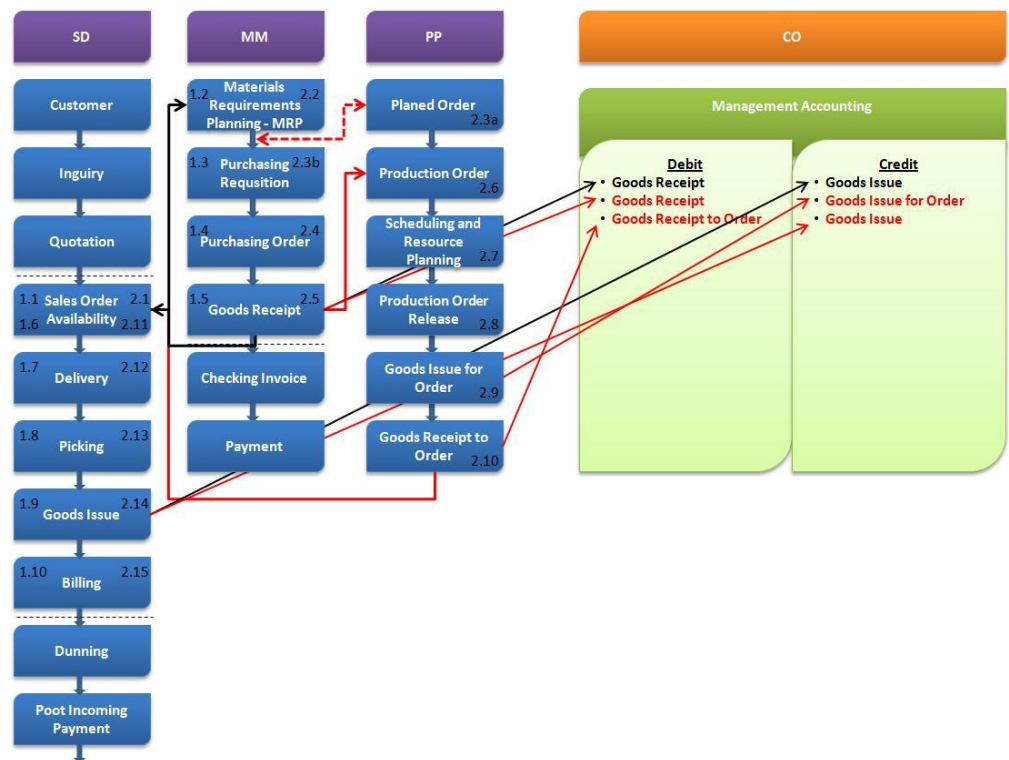

Figure 30: Management Accounting Connections in Order-Delivery Process

Scenario 1 has its connections and route drawn in black whereas the scenario 2 connections and route are drawn in red, to increase the readability of the figure.

5   CONCLUSIONS AND SUMMARY

This Bachelor's Thesis study was initiated to find accounting connections configured in order-delivery process operated in the SAP enterprise resource planning platform, in order to add value to the teaching material used in Metropolia University of Applied Sciences. The need for this study arose from desire to upgrade the messages offered about the order-delivery process at Metropolia University of Applied Sciences. This study answers to the question of how to integrate order-delivery process to accounting in SAP system and add value to teaching material concentrated on the subject.

From the beginning of this study the question was to study how the order-delivery process is integrated to accounting in SAP system and how it can add value to teaching material concentrated on the subject. The theoretical phase of the study was composed to give needed background information to the practical phase of the study. The practical phase was first planned and then carried out by following the plan. The plan gave guidelines for composing the results from the practical phase of the study. This made composing the results and analyzing them fairly easy. The results of this study were quite clear and answered the question set at the beginning of this study.

To ensure the validity and reliability of the study at the theoretical level, the theory study was done by using independent sources together with the information considering the modules used in the study, provided by SAP AG. The theoretical background of this study consists of two parts. The first part of the theory consists of enterprise resource planning, enterprise resource planning system, order-delivery process and accounting. The second part is overview to the SAP modules used in the practice phase of this study.

The practical phase of this study was conducted in SAP enterprise resource planning system, based on the teaching scenarios currently used as a part of the lectures for order-delivery process. The scenarios are configured to the SAP system and used for locating the accounting configurations in the order-delivery process by running tests in the created environmentWhen conducting the test runs at the practical phase of the study, actions were

recorded step by step for follow up. This was done to ensure the validity and reliability of the study at the practical level.

The results were clear and provided the desired outcome set at the beginning of the study. The configured accounting connections to the order-delivery process were located and analyzed. Teaching material was upgraded to answer better to the subjects needs and to give wider perspective to the relationship between order-delivery process and company's management and financial accounting.

This study was conducted from engineering point of view, concentrating to the research problem as the order-delivery process as a starting point. Locating the connections between the order-delivery process and accounting caused some ideas to rise up.

A similar study could be interesting from accounting point of view. Either one, financial accounting or management accounting module, could be the starting point, depending on the interests of the researcher. Following just one or few designated accounts could offer interesting and valuable information on some specific purpose, this option would have to be conducted in more complex order-delivery system, in order to have the study wide enough.

REFERENCES

Big4Guy (2009). *Big4Guy* http://big4guy.com/index.php/2006/02/03/sap_pp_production _planning _interview_que (Accessed Nov 6, 2009)

Haverila, Matti J. - Kouri, Ilkka - Miettinen, Asko - Uusi-Rauva, Erkki (2005) *Teollisuustalous.* Tampere: Infacs Oy.

Sakki, Jouni (1999). *Logistinen prosessi.* Espoo: Sakki Oy.

Sakki, Jouni (2009). *Tilaus-Toimitusketjun Hallinta.* Vantaa: Sakki Oy.

SAP AG MM (1998). *Functions in Detail – MM R/3 Systems Materials Management.*

SAP AG PP (1996). *Functions in Detail – PP-PI R/3 Systems Production Planning for Process Industries.*

SAP AG SD (1996). *Functions in Detail – SD R/3 System Sales and Distribution.*

SAPdocs.info (2009). *Finance & Controlling.* http://sapdocs.info/application-modules/fi-co-overview/ (Accessed Oct 28, 2009).

SAP Documents (2009). *PP overview.* http://sapdokumanlari.wordpress.com/pp-module-introduction/ (Accessed Oct 29, 2009).

SAP SCM Planning (2009). *Work Center.* http://sapplanning.org/2008/01/05/work-center/(Accessed Nov 6, 2009).

Scharay, Philip B. - Skjott-Larsen, Tage (2002). *Managing the Global Supply Chain.* Copenhagen: Copenhagen Business School Press, 2. edition.

TheSpot4SAP.com (2009a). *What is the SAP FI Module – Tutorial.* http://www.thespot4sap.com/IntroTo/SAP_FI_Module_Introduction.asp (Accessed Oct 29, 2009).

TheSpot4SAP.com (2009b). *What is the SAP CO Module – Tutorial.* http://www.thespot4sap.com/IntroTo/SAP_CO_Module_Introduction.asp (Accessed Oct 29, 2009).