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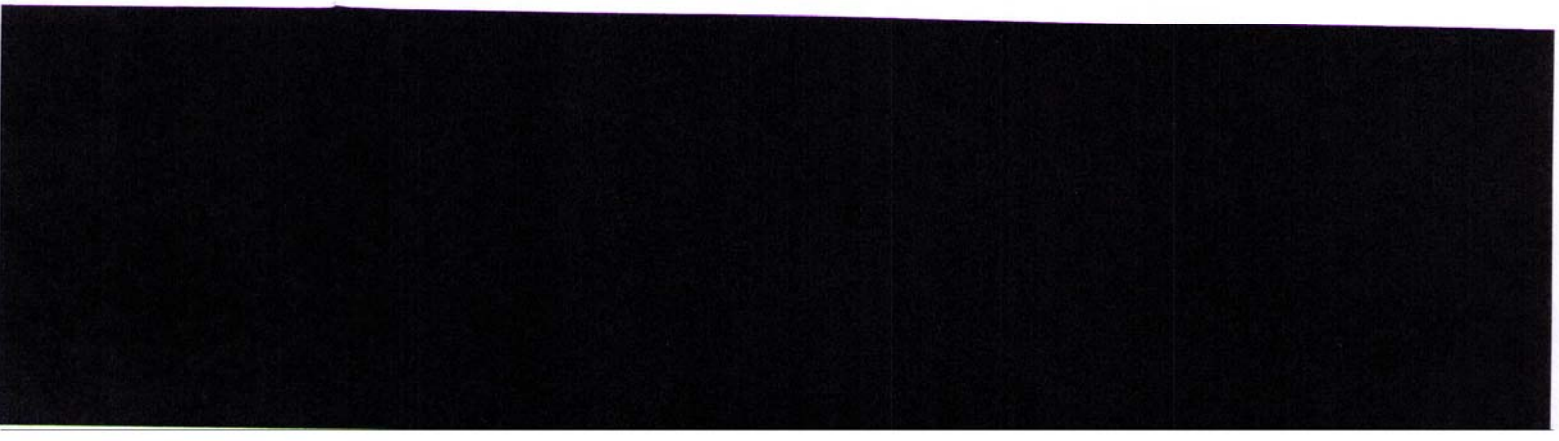

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Florence, September, 2007

Dear MITIP 2007 participants.

It's a great pleasure to welcome you in Florence and to thank you for attending the 2007 Modern Information Technology in the Innovation Processes of the Industrial Enterprise (MITIP) conference.

The conference is patronized by the Florence University, one of the oldest University of the world. It was founded in 1364 by Emperor Carlo and today it counts almost 64000 students distributed in 12 faculties.

As every year, also for this edition, we have received papers from a lot of "old friends": I'm looking forward to meeting each and every one of them. Nonetheless, many first-time comers are attending the conference, and a very special welcome goes to them as well. We have a significant number of participants from Germany, France, Czech Republic, Poland, Romania, and of course, from Italy. Almost 15 different countries all over the world are represented.

We are really satisfied also for the scientific content of the conference. We have received more than seventy contributions. After the review process, 64 papers have been accepted for presentation. All of them are included in these proceedings, and classified according to 9 different research topics (corresponding to the conference tracks). As a result, we have 12 panel sessions to be attended. The quality of the final program is outstanding and I am sure you will find lots of interesting sessions to attend.

These results confirm that our community, involved in important researches in the field of IT-driven business innovation, is very active. In my opinion, the MITIP is more and more representing a fundamental trait d'union between two different worlds (but not different people): the world of computer science and the world of the industrial and managerial engineering. Here in the MITIP we have set the stage for the birth of a new species, composed by undoubtedly very vital researchers and we're sure that it will be more and more appreciated in the scientific community.

In conclusion of this brief introduction I want to thank the people that have contributed to organizing and promoting this edition of the MITIP conference.

I thank the Scientific Committee as a whole, which helped us promoting the conference and reviewing the papers.

I thank professor Alberto Tesi, Dean of the Engineering Faculty at Florence University, for his welcome speech, and professor Andrea Arnone, Director of my Department, for accepting the proposal to organize this event in Italy and for the collaboration that the department's Administrative staff has provided us.

I thank the keynote speakers, professor Hamideh Afsarmanesh, from Amsterdam University, and to dott.ing. Sergio Romoli from SAP: the proposed keynotes on Information Systems for networked enterprises will be surely precious to guide our future researches. A warm thank goes also to Flavio Tonelli for his tutorial "Qualitative and quantitative research methodologies in operations management": our PhD candidates and researchers will find it significantly valuable. I thank also Romeo Bandinelli for having greatly managed the special tracks on the networked enterprises.

I offer my "big thanks" also to the Organizing Staff: Marie Helen Piette, and Guido Galanti from the Polo Biomedico e Tecnologico; Elisa Del Sette, Silvia Papi, Valentina Gamberi and Simona Lo Nardo, alumni of the Managerial Engineering course. All of them have worked enthusiastically and effectively.

Last, but not least, a special thanks goes to my colleague Filippo Visintin, conference co-chair. Without his constant and valuable support, the MITIP 2007 would not have been possible: he deserves the main credit for this success. I hope that your attendance will be pleasant professionally rewarding. Have a great conference!.

Mario Rapaccini,

MITIP 2007 conference chair

TABLE OF CONTENTS

INFORMATION EXCHANGE AND ENTERPRISE APPLICATION INTEGRATION

INTELLIGENT MANUFACTURING SYSTEMS AND PRODUCTION MANAGEMENT

PRODUCT TRACEABILITY SYSTEMS & RFID

QUALITY AND MAINTENANCE ENGINEERING AND MANAGEMENT

SIMULATION MODELING AND ANALYSIS

CHANGE AND INNOVATION MANAGEMENT

PRODUCT DEVELOPMENT AND PROCESS DESIGN

DEVELOPMENT OF A DATA WAREHOUSE REFERENCE MODEL FOR SUPPLY CHAIN CONTROLLING

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1. INTRODUCTION

In the paper the development of a data warehouse (DWH) reference model for supply chain controlling is introduced. The reference model has its focus on the data modeling content on the conceptual layer and therefore is constructed according to the multidimensional meta-model. Furthermore, some design guidelines and options for data warehouse architecture are outlined.

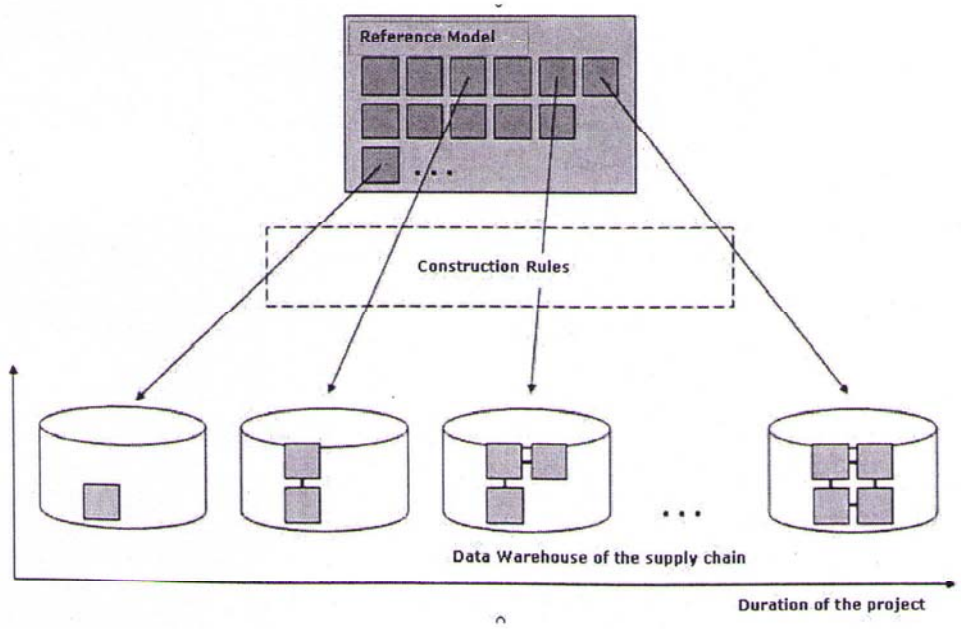

Figure 16: Construction of a data warehouse using a reference model [2]

A reference model is a tool of knowledge management and a good means to provide supply chain management decision makers with current supply chain management theory. Since controlling systems are based on information technology, it seems to make sense to deliver this knowledge in the form of a data warehousing reference model, to facilitate DWH based controlling solutions right from the beginning.

2. SUPPLY CHAIN CONTROLLING

Supply Chain Management (SCM) is a still evolving discipline that is under permanent development and in many areas lacks a solid theoretical foundation. According to controlling theory, Supply Chain Controlling (SCC) is put in place to support Supply Chain Management by providing relevant knowledge and information.

A state-of-the-art model has been developed to increase the understanding of supply chains and to integrate current management concepts and instruments bringing the following results:

- Structure and elements of modern supply chains are directly built into the new developed data model that is presented in the paper.
- Management and modeling approaches for supply chains such as Efficient Consumer Response (ECR), Collaborative Planning Forecasting and Replenishment (CPFR), Supply Chain Operations Reference Model (SCOR) and so on, that again provide the basis for the model content.

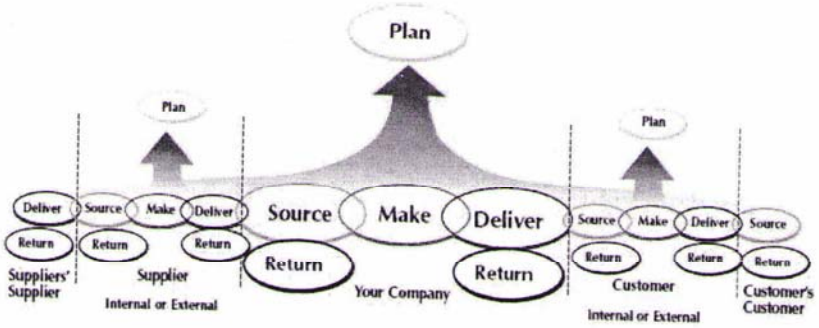

Figure 17: Structure of the SCOR model [2]

Further subjects that have been addressed were the information technology building blocks found in current supply chains (such as Enterprise Resource Planning and Advanced Planning and Scheduling software) and the changing role of logistics service providers in supply chain management to develop architectural guidelines for the data warehouse. Within supply chain controlling, some specific approaches and instruments have emerged, whose examination constitutes the second part of the chapter on supply chain controlling.

3. DATA WAREHOUSING

There is some recent development in data warehouse development processes and requirements analysis in data warehousing that influence the overall structure of the reference model to be created:

- The long lifetime and broad scope of a data warehouse makes specifically designed development processes necessary which are highly iterative.
- The process of identifying information needs of the data warehouse customers needs to be analyzed to define those phases and activities that are supported by a DWH reference model.
- There are many approaches for actually creating a multidimensional data warehouse data model (ADAPT, DFM, UML dialects, etc.) These have been examined to decide which to use for modeling.

4. THE REFERENCE MODEL

The main idea behind this approach towards supply chain controlling is to initially build a generic supply chain model that can incrementally be augmented with additional model content (like finance or warehousing) that consistently integrates with the previous as well as the future model content because it can all be added onto the generic model template. For example, the DWH development can focus on process modeling in early phases of the project and then put an emphasis on information about stocks of physical goods in subsequent phases. This supports current incremental DWH development processes on the one hand, but also helps to create new information about the supply chain using Online Analytical Processing (OLAP) tools.

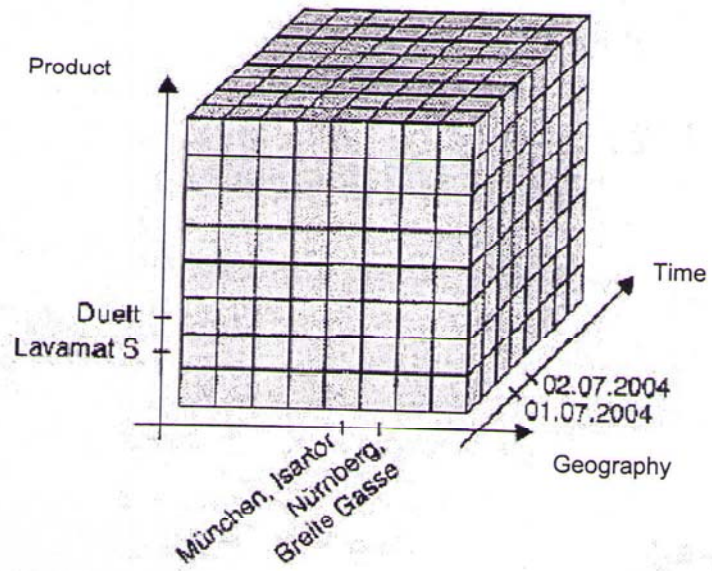

Figure 18: Online analytical processing (OLAP)

Data are depicted as cubes – so called „data cubes". These „data cubes" contain key figures that represent events, activities, or other facts of interest. To categorize and organize the central facts, they are allocated to dimensions e.g. geographical regions, product groups etc.

This is due to the fact that the DWH modeler does not constraint the data warehouse model, because the reference model structure allows for making less assumptions and premises about the object under examination – that is, the supply chain. Furthermore, the supply chain model has to be built using the multidimensional model structure to consistently embed it into the multidimensional DWH model.

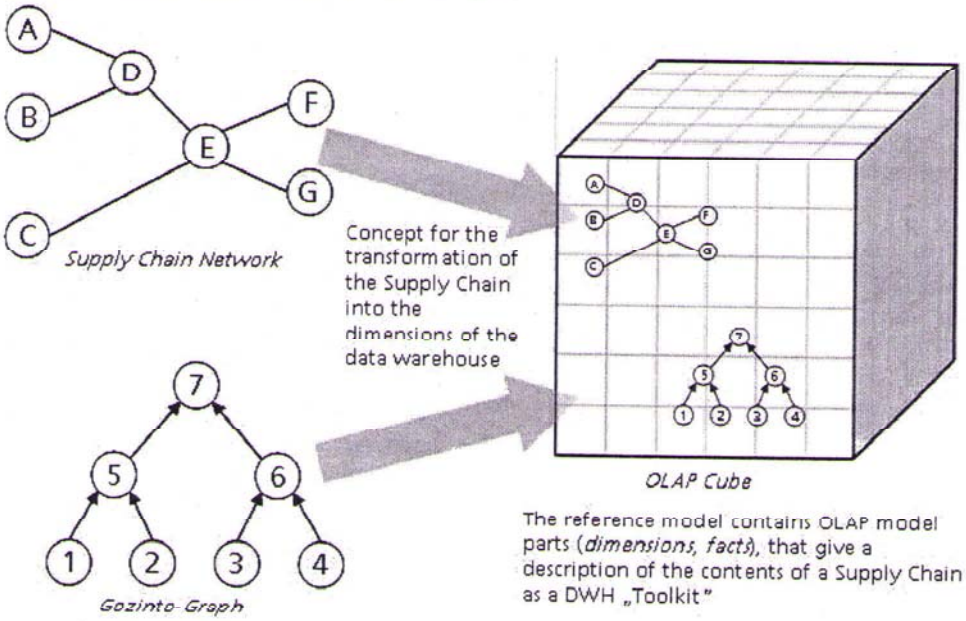

Figure 19: Elements and structure of the Data Warehouse Reference Model

The reference model consists of several parts:

- Supply Chain Network: the supply chain network describes the topology of the supply chain and – in its initial form - is simply constructed from edges and vertices (i.e. a graph) that show peers (organizational units within the supply chain of a certain granularity and abstraction level) and interactions between them.
- Product Component Tree: this model basically is a gozinto-graph showing how the components that are flowing through the supply chain are eventually combined into the finished product. The combination of components in order to produce a component of higher value is performed within certain peers within the supply chain network. These links between components and peers have to be explicitly modeled.
- Views: views group model elements of a certain subject (processes, material flow, finance etc.). The idea is to analyze and model a certain subject as isolated as possible during the development of the DWH. A view consists of dimension hierarchies and facts (a defined by the multidimensional meta-model). Elements of

different views may be connected among each other to make it possible to extend an existing data warehouse data model using content from a new (i.e. previously unused) view and to perform OLAP operations on facts based on these extended dimension hierarchies.

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