Advanced Planning in Supply Chains – Illustrating the Concepts Using an SAP APO Case Study

Winter Semester 2013/2014
Course ID: 1663
Lecture room: 0544 (Seminar room – entrance Luisenstr.)

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The world today is characterized by global supply networks comprising a multitude of partners (e.g. suppliers, distribution and retail centers, plants, customers). These supply networks have to be well coordinated in order to achieve efficiency and good customer service.

Over the recent years so-called Advanced Planning and Scheduling (APS) systems have emerged which complement traditional ERP systems. Their major characteristics are the use of mathematical optimization techniques and the integration into comprehensive supply chain management concepts. In this teaching module we will look more closely at SAP’s advanced planning tool APO and use a case from the food industry, the fruit juice producer Frutado, to illustrate how integrated planning over various modules and decision levels can be realized.

The main planning tasks of the supply chain which will be investigated are:

- Demand Planning (DP)
- Supply Network Planning (SNP)
- Production Planning and Detailed Scheduling (PP/DS)
- Available to Promise (ATP)
- Deployment
- Transportation Planning and Vehicle Scheduling (TP/VS)
Objective

You will …

- … know the concepts and methodologies used in advanced planning
- … apply quantitative techniques for solving supply chain problems
- … understand the interdependences of planning decisions made on different levels of the planning hierarchy
- … understand the structure and methodology used in commercial Advanced Planning Systems (APS) such as SAP APO
- … model practical planning problems with SAP APO
- … understand the implementation and use of an Advanced Planning System (APS) for solving real-life problems

Previous knowledge expected

Participants should …

- … have an interest in …
  - … practical problems of production planning, scheduling and logistics,
  - … the quantitative modeling of business problems.
- … be familiar with basic Operations Research (OR) techniques and optimization modeling in particular.
- … therefore have taken part in in the module Produktionsmanagement und Management Science” or similar modules at other universities.
- … be aware that a previous participation in the following modules is strongly advised:
  - Basics of Advanced Planning and Supply Chain Management and
  - Modeling, Optimization and Simulation in Operations Management or similar modules at other universities.
Assessment

- Go through all modules of the APO learning units.
- **Assignment 1**: Exercises for DP, SNP and PP/DS (25%)
  Hand in 2 paper copies in class on Tuesday 04.12.2012. Also e-mail to radu.c.popa@tum.de
- **Assignment 2**: Exercises for ATP, Deployment and TP/VS (25%)
  Hand in 2 paper copies in class on Tuesday 22.01.2013. Also e-mail to radu.c.popa@tum.de
- **Written exam (50%)** – Book can be used in the exam, no written notes allowed in the book

Assignments 1 and 2 are made in groups of 2 students.

Course literature

**Preliminary schedule**

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<tr>
<th>Date</th>
<th>Lecture</th>
<th>Student presentations / Assignments / Learning units (LU)</th>
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<tr>
<td>15.10.2013</td>
<td>Introduction to course&lt;br&gt;Hierarchical planning&lt;br&gt;Strategic Network Design</td>
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<tr>
<td>22.10.2013</td>
<td>The Frutado case&lt;br&gt;SAP APO&lt;br&gt;Demand Planning (DP)</td>
<td>LU: The Frutado AG and APS&lt;br&gt;Hand out Assignment 1&lt;br&gt;Form groups</td>
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<td>Demand Planning (DP)</td>
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<td>Master Planning</td>
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<tr>
<td>12.11.2013</td>
<td>Master Planning</td>
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<tr>
<td>19.11.2013</td>
<td>Production Planning and Detailed Scheduling (PP/DS)</td>
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<td>Guest lecture – Markus Meiler (Bayer)</td>
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<tr>
<td>26.11.2013</td>
<td>Production Planning and Detailed Scheduling (PP/DS)</td>
<td>LU: PP/DS</td>
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<td>03.12.2013</td>
<td>Available to Promise (ATP)</td>
<td>LU: ATP&lt;br&gt;Hand in Assignment 1</td>
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<tr>
<td>10.12.2013</td>
<td><strong>Room 0534</strong>&lt;br&gt;Assignment 1</td>
<td>Presentations Assignment 1&lt;br&gt;Hand out Assignment 2</td>
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<td>17.12.2013</td>
<td>Deployment&lt;br&gt;Guest lecture – Dr. Michael Brieke (MAN)</td>
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<td>07.01.2014</td>
<td>Deployment&lt;br&gt;Transportation Planning and Vehicle Scheduling (TP/VS)</td>
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<td>14.01.2014</td>
<td>Transportation Planning and Vehicle Scheduling (TP/VS)</td>
<td>LU: TP/VS</td>
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<td>21.01.2014</td>
<td>Guest lecture – Dr. Poorya Farahani (SAP)&lt;br&gt;Course evaluation</td>
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<td>28.01.2013</td>
<td>Assignment 2</td>
<td>Presentations Assignment 2</td>
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<td>04.02.2013</td>
<td>Exam (to be confirmed)</td>
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