

PRODUCTION PLANNING & CONTROL-THEORETICAL VIEW AND IMPLEMENTATION OF SAP/R3 IN AN AUTOMOTIVE COMPANY

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ABSTRACT

For the car industry, progress and flexibility represent the keys for success. Cutting down the costs concerning the organization of the manufacture and production is the major claim of the current world of automobiles. Production Planning and Control - PP&C occupies an important place in this flux of information and materials. Throughout this paper, the most important features of SAP/R3- an instrument of development PP&C for a company in the automobile area will be briefly described. The spectrum of applications offered by SAP/R3 covers all the marketing and management modules known by this time. The circuit of manufacture controlling starts with the aperture and release of the order and ends with the manufacture of the product itself. The performances are defined for a particular order. In this way, the outputs of products are being registered from the economical and technical point of view and the resulted materials are being inventoried on their value and quantity.

Keywords: SAP, PLM, PP&C

1. GENERAL CONSIDERATIONS

New technologies such as computer-integrated manufacturing – CIM permit manufacturers to implement strategies and objectives to increase productivity. CIM deals with the integration of manufacturing activities and support facilities using computers. CIM allows enterprises to meet higher levels of objectives that are unattainable with partially computerized industries. The objectives are as follows:

- develop quality products at competitive prices
- integrate and control design and manufacturing operations
- manage finances
- increase sales by controlling product demands

When implemented properly, CIM can realize the enterprise goals. To see how that is possible, now examine the major areas of CIM:

- marketing
- engineering design
- research and development
- manufacturing operations
- financial planning

The benefits that result from the implementation of CIM extend into each functional area of the manufacturing enterprise.

2. PRODUCTION PLANNING & CONTROL – PP&C

PP&C is a classical area of application for the electronically processing data into the entire production process. The term PP&C is used to describe the way the informational systems are used for planning, supervising and controlling the life cycle processes of the product, starting with the collection of the data (the order) and ending with the product delivery, considering in the mean time the quality aspects given by the placement and the capacity. PP&C systems are created to satisfy the next operational objectives:

- improvement in the knowledge of the data delivery;
- improvement the informational flow;
- cut in of delivery terms;
- cut of the stock levels in time, maintaining the levels of available materials and parts.

PP&C supports different activities inside and outside a company, defined as questions:

- What kind of products have to be produced, when and in what quantity?
- What kind of parts and assemblies have to be produced at some points and in what quantity?
- How many parts have to be ordered from outside, at what quality, at what moment in time and from which supplier?
- What level of capacity is being used? Are the available material and human resources enough to fulfill the production program?
- What kind of measurements must to be plan, if there will exist the need to surpass or diminish the available capacity?

Considering PP&C, it is possible to define the difference between the planning activities and the ones of control.

The communication between services must also be assured, figure 1.

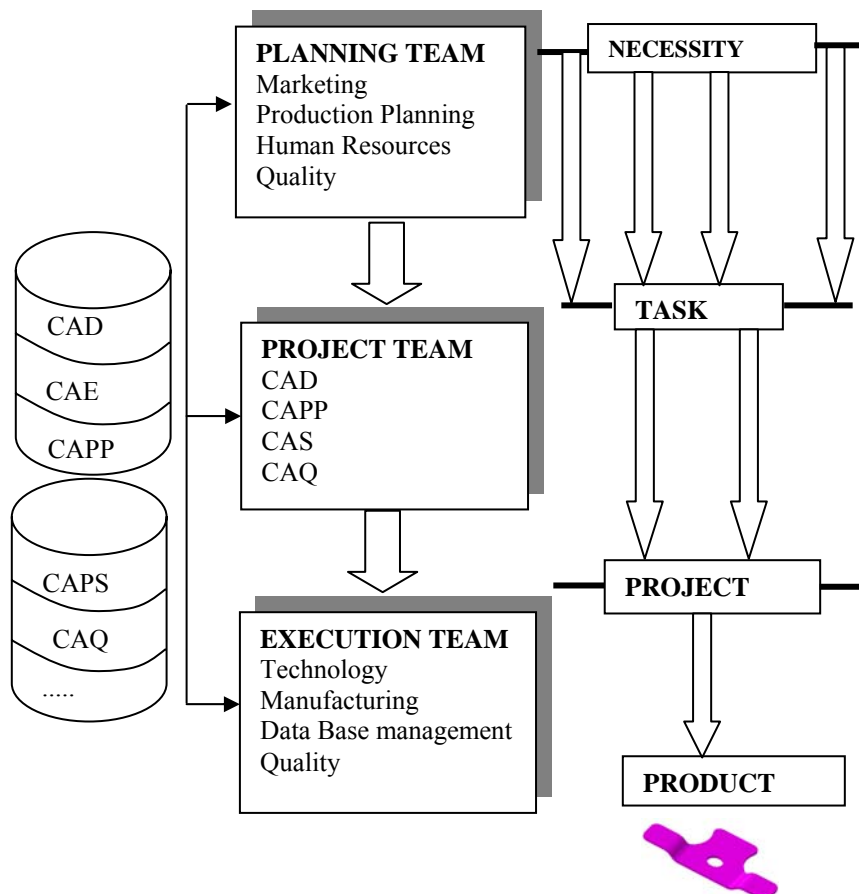


Figure 1: The communication between enterprise activities

Industrial production planning and control are based on different types of data. They serve as starting point for the main complementary functions. The types of data are:

- Master date;
- Current date (information);
- Variable date.

The information files stand for the base of PP&C system, made of order processing, materials circuit, production orders and master files:

- Master file of the client, needed for the sales, accountancy and order processing. It can be also used for planning the sales and for their direct promotion.
- Master file of the product, mainly requested for production and for the optimisation of the expected materials.
- The file of the current order, used for the client's orders.

3. THE SAP/R3 IMPLEMENTATION IN AN AUTOMOTIVE COMPANY

Organizing a company depends essentially on its importance and on the types of the manufactured products. It is believed that the resources of a factory are organized on a structure determined by its functions. The main four elements of the factory are:

- The **product** - end result of the manufacturing process can be a tangible good or service;
- The **costumers** - a person, company, or other entity which buys goods and services produced by another person, company, or other entity;
- The **supply** - total amount of a good or service available for purchase;
- The **resources** - a person, asset, material, or capital which can be used to accomplish a goal, equipment, people, assets (money).

The necessity of phase analyzing and developing has great importance in the lifecycle of a product, having consequences on costs, quality and the delivery terms.

In the framework of the automobile industry one will not be interested in the long term planning for the most detailed pieces, for example different equipment characteristics of the automobile, like colour, motor capacity, etc. Moreover, considering that a category would comprise for instance 30.000 units one would like to ask how many, for example left and right B-Pillars, to be fabricated. These necessities create themselves so-called secondary-necessaries, that will appear in the list with the beneath presented construction groups and raw materials. The figure 2 present the packing list from SAP for material suppliers.

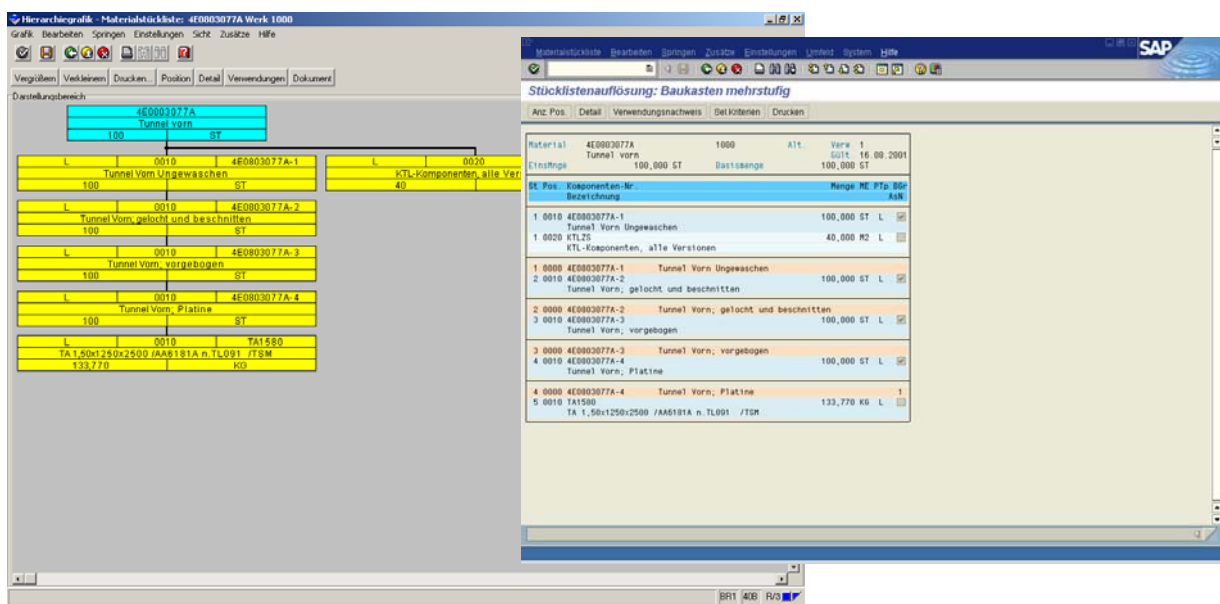


figure 2: The packing list and list of items from SAP

Supposing one takes into consideration the whole spectrum of pieces that an automobile supplier with cca. 1200 pieces, so can be completely raised the number of individual needs up to factor 4 to 5, at a fabrication depth of about 5 working steps the splitting of individual construction groups until the level of raw materials. If one wishes to include in the general planning also the necessary for the intermediary levels, this will lead to a grow of the number of individual elements. Modern planning tools satisfy the customers' primary needs for complete lists and through this the linked work plans and consequently create secondary needs at every fabrication level. At the end of this splitting process are the raw pieces and pieces to be bought.. It can be easily imagined that such enormous quantity of data can be kept under control just with the help of a fine planning system.

SAP/R3 is an ERP system and support MRP with the PS planning and control module.

The PS isn't a MRP development, but a module in the production planning, which completes the PP&C module. If the development of the standard production processes, like mass production, is represented through the PP, the production of individual commands is supervised in return through the Project Management systems.

Figure 3 the representation of a PS order with a tool model.

Vor...	Bezeichnung	Dau...	E...	Arbeit	Ei...	Arbeitsp...	Werk/Vortag...	θ	Leist...	F...	V...	A...	Pr...	Ver...	A...	PStd	PS
0010	Projektleitung	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	PL-MA
0040	Planung	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	SD-MA
0050	KON_AV - Material + WKZ-FA	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	KON-M
0060	Musterstatus Artikel	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	QS-MA
0065	Festlegung aller Serienmaterialien	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	PL-MA
0070	Serie_MAT	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	PL-MA
1001	KON-SW1-NEU	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	KON-M
1002	WKZ-SW1-Mat	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	PL-MA
1003	WKZ-SW1-NEU	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	WKZ-M
8091	Vorserie	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	FERT-I
8092	QS Abnahme WKZ-Satz	0,0	TAG	0,0	STD	2000	0	01	0	0	0	0	0	0	0	0	QS-MA

Figure 3: The PS order with a tool model

The PS system is used in the automobile industry to track the deadlines and costs in the tool shop and in the construction of models for the car body parts. For the construction of a future aluminum wing or a steel plate, first you need the necessary models, which are bending and punching tools. For a single part of the car body, there are created up to 6 or 7 individual tools, depending on the part's complexity.

4. REFERENCES

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