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Study of Product Costing through FACTON Software in Automotive Industry

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Abstract

To maximize profits, businesses must find every possible way to minimize costs. While some fixed costs are vital to keeping the business running, a financial analyst should always review the financial statements to identify excessive expenses that do not provide any additional value to core business activities. When an analyst understands the overall cost structure of a company, he/she can identify feasible cost reduction methods without affecting the quality of products sold or service provided to customers. The financial analyst should also keep a close eye on the cost trend to ensure stable cash flows and no sudden cost spikes occurring. ABC industries continuously optimizing the combustion engine, driving forward the use of alternative fuels, and laying the foundation for the widespread acceptance and worldwide introduction of e-mobility.Based on a broad systems competence consisting of Engine Systems and Components, Filtration, and Thermal Management, the group's product portfolio addresses all the crucial issues relating to the power train and air conditioning technology. Thanks to its expertise in electric and electronic components and systems, ABC can thus also offer integrated system solutions for e-mobility.ABC products are fitted in at least every second vehicle worldwide. For decades, ABC components and systems have also been used on the world's racetracks and off the road—in stationary applications, for mobile machinery, rail transport, as well as marine applications.This study involved a detailed understanding of the Product costing and how costing process can be improve with the help of FACTON EPC software.

Keyword :*Product ,Costing , FACTON Software, Automotive Industry*

Introduction

Manufacturing becoming a more and more competitive market, companies globally strive to increase their efficiency.Manufacturing processes are typically complex and consume large amounts of resources. Cost monitoring within the product/processes is typically performed only at a high level because the impact of this cost thousand dollars and the information gained at the sub-system level is incomparable in value. Modeling of these systems can be achieved, but the complexity of these systems results in high costs in time and information to create these models. Product costing is an accounting methodology that traces and accumulates direct costs, and allocates indirect costs of a manufacturing process. Costs are assigned to products, usually in a large batch, which might include an entire month's production. Eventually, costs have to be allocated to individual units of product. It

assigns average costs to each unit, and is the opposite extreme of Job costing which attempts to measure individual costs of production of each unit. Process costing is a method of assigning costs to units of production in companies producing large quantities of homogeneous products. The costing method applicable where goods or services result from a sequence of continuous or repetitive operations or processes. A process can be referred to as the sub-unit of an organization specifically defined for cost collection purpose.
For this project we worked with the manufacturing company, ABC Engineering Services India Private Limited (MESIPL), in Pune, India. We focused on the company's one of the main departments, "Process Planning and Costing", which is responsible to derived cost for various product of ABC industries across the world. Currently MESIPL is providing supports in various fields like CAD, Quality, Process Planning and Costing, Purchasing, Logistic and Global Sourcing to various manufacturing locations of ABC industries.

Process Planning and Costing is one of the key departments of ABC Industries as it deals with the final product cost via Minimum Sales price (MSP) i.e nothing but the quotation which ABC need to submit to Customer. FACTON EPC is trending software which take care of costing and which helps to Study, Analyze and Review the costing for a particular product within different phases of manufacturing like Acquisition/ Development/ Series. Companies from US and European countries have been started to use this software but in India proportion to use of this software is less. Our final goal of this project is to study and analysis of FACTON EPC software for that you have studied different features of FACTON as well as user interference. Also, complicity/ simplicity related to the software and its performance.

1. Literature Review

FACTON EPC software is an enterprise product costing solution for the automotive and manufacturing industry. Facton's headquarters is in Potsdam, Berlin. Facton has a revenue of $15M, and 106 employees. Facton's main competitors are aPriori, Siemens and EcoSys. as of August 2019.

Process costing is an accounting methodology that traces and accumulates direct costs, and allocates indirect costs of a manufacturing process. Costs are assigned to products, usually in a large batch, which might include an entire month's production. Eventually, costs have to be allocated to individual units of product. It assigns average costs to each unit, and is the opposite extreme of Job costing which attempts to measure individual costs of production of each unit. Process costing is usually a significant chapter. It is a method of assigning costs to units of production in companies producing large quantities of homogeneous products.

Process costing is a type of operation costing which is used to ascertain the cost of a product at each process or stage of manufacture. CIMA defines process costing as "The costing method applicable where goods or services result from a sequence of continuous or repetitive operations or processes. Costs are averaged over the units produced during the period". Process costing is suitable for industries producing homogeneous products and where production is a continuous flow. A process can be referred to as the sub-unit of an organization specifically defined for cost collection purpose

Product Cost Calculation

The ABCGroup companies are responsible for the product cost calculations of the products they sell to other Behr subsidiaries. The basis for the transfer prices within business plan are the cost calculation with status June/July (depending on the planning schedule). For the SAP GRIPS

companies, the calculation version X110 and X120 (specifically for Series) are set up and applied according to company.
The current calculations have to be made available in the ERP systems. Authorities check these calculations for plausibility and informs the respective company if there are any inconsistencies. If calculations are not available in ERP systems, there are two approaches to solve this problem.
Initially it is important to distinguish between serial projects (A), development projects (B) and acquisition projects (C).

1) If it is the serial project a proper calculation has to be prepared. And the new correct calculation has to be entered into SAP. All status A materials will be taken out of SAP (X110 costing variant).

2) Concerning the B and C products the latest pre-calculation from FACTON (current) can be used if there is no valid costing within SAP R/3 available. If there is no valid calculation in FACTON available, B and C products have to be linked to an existing part number as reference with a valid SAP costing.

Objectives:

1. To understand Purchasing and Product cost calculation in organisation.To understand Product costing structure in organisation through SAP

2. Procedure involved while doing costing in FACTON

3. Analysis of FACTON software for product development

Roles & Responsibilities of Costing:

Generally, product costing lies in the core responsibility of the controlling department – essentially, with the ME controllers for the products produced in each ME. However, the accurate calculation of product cost is dependent on the data quality of many other functions at ABC Behr (e.g. production and logistics for lot sizes, routings and bill of materials or also purchasing for purchased part prices). Therefore, the achievement of high quality product manufacturing cost calculations is a company-wide task, which is governed and coordinated by controlling.

Controlling is responsible for assuring that all active products have a valid cost calculation in line with the ABC Behr product costing standards displayed in this guideline. A further core controlling responsibility is the analysis of variances between planned and actual product costs as well as providing explanations and countermeasures to the management. The methods and tools for variance analysis are also presented within this chapter.

To determine the overall product manufacturing cost, many pieces of information need to combined, such as material prices, quantities consumed, times required in production, costs of internal resources used for producing the goods and services, etc. The relevant costing module in SAP pulls all the required information together and determines the product cost in a pre-defined structure. The structure, which defines how the costs are clustered and displayed, is defined within the SAP CO-PC (product costing) and called calculation scheme or costing sheet. Because the calculated product costs in controlling are required for inventory valuation in legal accounting and have a direct effect on the P&L and balance sheet, the legal and statutory requirements must be considered.

The costing sheet therefore distinguishes between manufacturing cost (essentially material plus production cost) and total cost (also including SG&A and R&D expenses). This structure enables the

controlling function to provide the legal manufacturing cost for inventory evaluation to FI and also to have a view on the total cost of a product.

To fulfil the requirements from the legal and the management view and to achieve utmost comparability of product cost throughout the BU3 MEs, ABC Behr has a globally valid costing sheet, which must be applied by all locations.

SAP Product Costing Overview

Product Costing is the tool used in SAP for planning costs and establishing material prices. It helps in estimating the Cost of goods sold manufactured and COGS of each for each product unit.

SAP provides two different types of material costing process viz Material cost estimate with quantity structure and Material cost estimate without quantity structure.

Material cost estimate with quantity structure works in combination of BOM (Bill of Material) and Routing assigned to it.

Product Costing is integrated closely to various SAP modules as origin of data comes from below SAP module: -

- Material Management (MM) module for material master record / purchase info record.
- Production Planning (PP) module for Bill of material (BOM), routing and work center.
- Cost Center Accounting (CO) module as information of cost centers, its linkage of work center, activity types and activity wise cost centers help in determining conversion costs associated with manufacturing process.

Results from Product Costing can also provide useful information for various SAP modules: -

- Material Management (MM) module for material and stock valuation.
- Sales and Distribution (SD) module
- Cost object controlling for calculating variances and WIP

Costing Run (CK13n)

Material selection– here we define the materials that need to be costed in a plant.
BOM explosion – this step involves exploding of material BOM after you have selected the material.
Costing – in this step the actual costing of materials happen, system creates the qty structure automatically (BOM/routings) as per the quantity structure control defined in the costing variant.
Analysis – in this step, results of costing run is analyzed and cost estimate is saved.
Marking – after costing analysis, this step updates the result in the material master as future standard price.
Release – updates the cost estimate in material master as current standard price, the stock value of material is changed and the new standard price for valuating material movements is active

Cost Estimation through FACTON:

We need to calculate the cost of product at different stages / phase of project. FACTON allow you to calculate as well as to do changes in calculation and find the best price for product.

FACTON itself has database which is link to the SAP, but in case if you want to adjust or want to change some values from database, FACTON allow to do. In case of acquisition and development phase of product, during calculation we create database for BOM and other factors in FACTON. In case of series / production phase, all the rates/ BOM part prices/ development cost have been decided and fixed in SAP. So we can pull the data from SAP into the FACTON and do the calculation.

FACTON is generally used through the Citrix system. Citrix is nothing but the server system. It is an American multinational software company that provides server, application and desktop virtualization, networking, software as a service, and cloud computing technologies.

Below are workspace window after log-in in FACTON.

FACTON screen

1.Main menu 2. Toolbars3. Workspace explorer 4. Information5. Project tab 6. Project information 7. Project tree 8. List style

Inputs to calculate Product Cost in FACTON

1. FSS (FACTON Summary Sheet): -It includes basic information about the project like SOP – EOP, Project responsible authorities w.r.t departments

2. PM (Purchasing Matrix):-

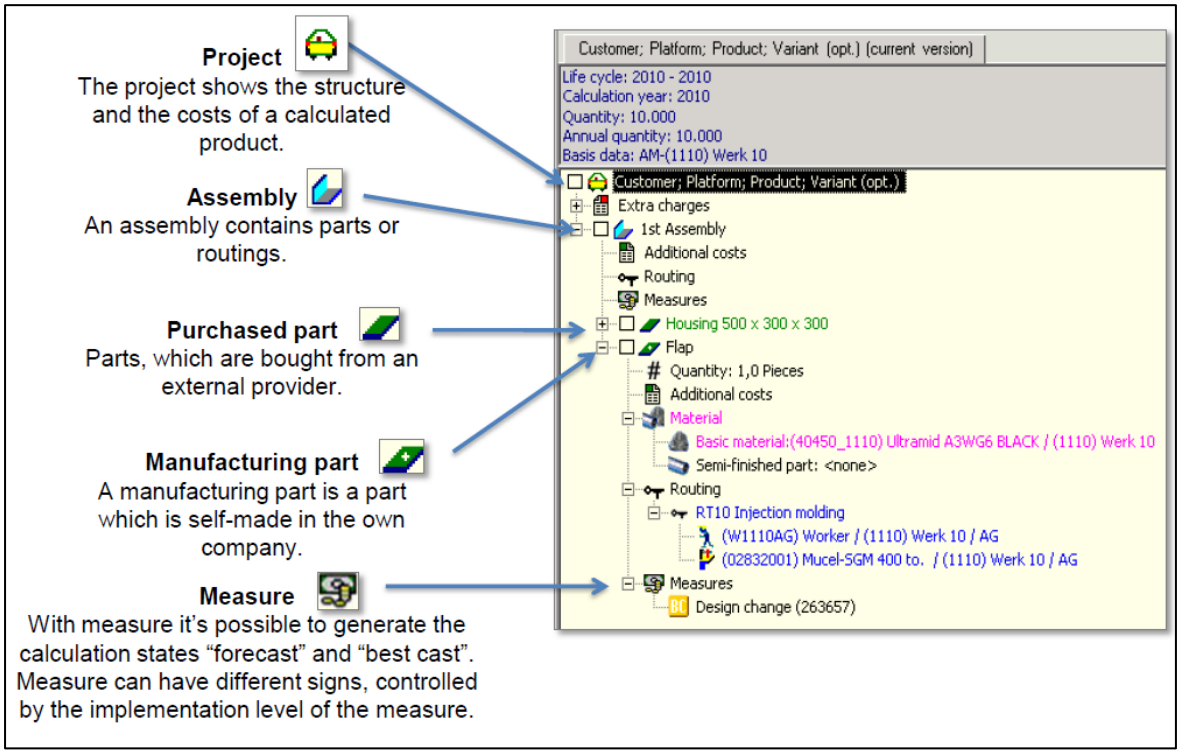
It contains all BOM related information.

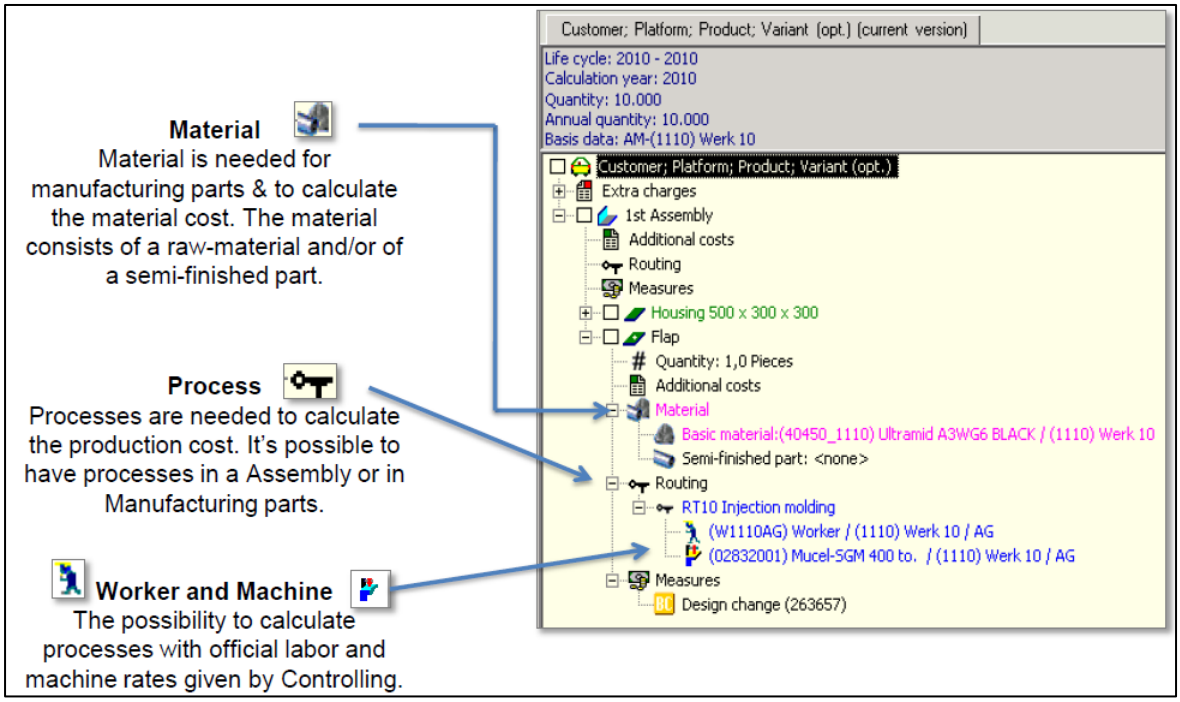
3. Routing information: -

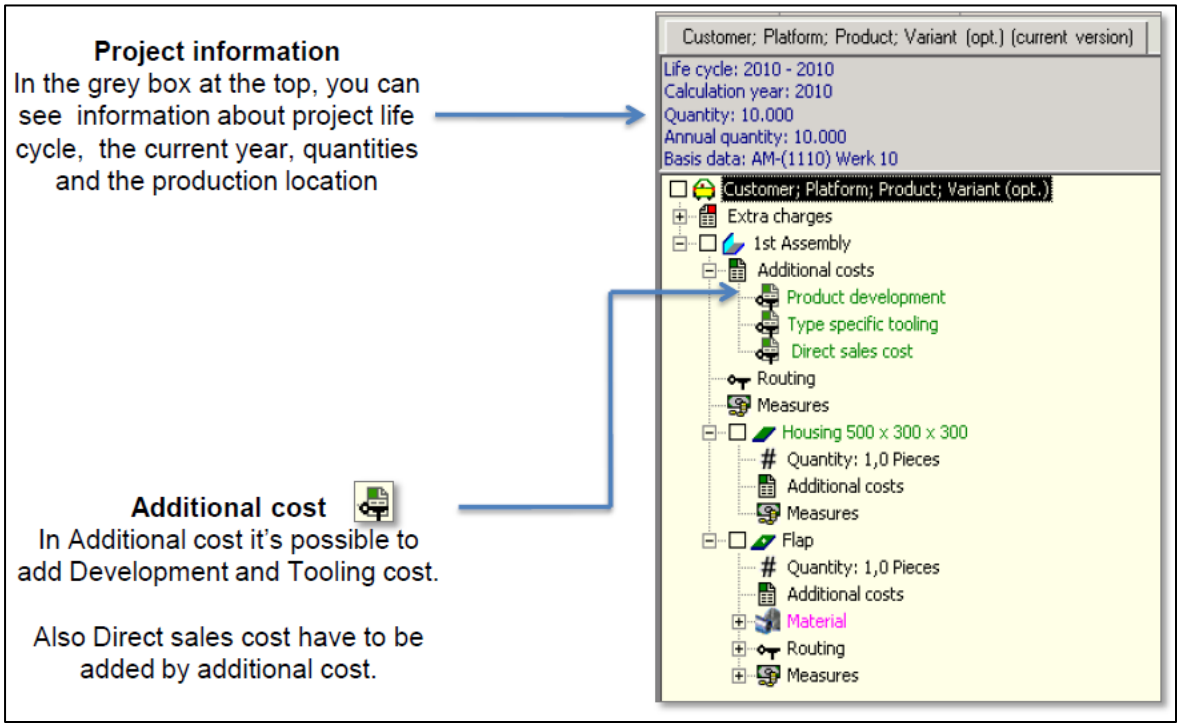
It includes production cost related information. If new machine rate needs to create, then that inputs also mentioned in that

4. Additional cost: -This includes development cost details for that specific project.

Project Structure in FACTON:



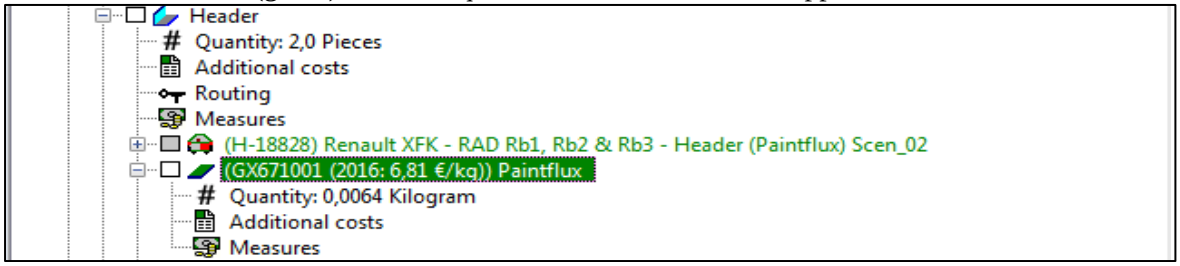




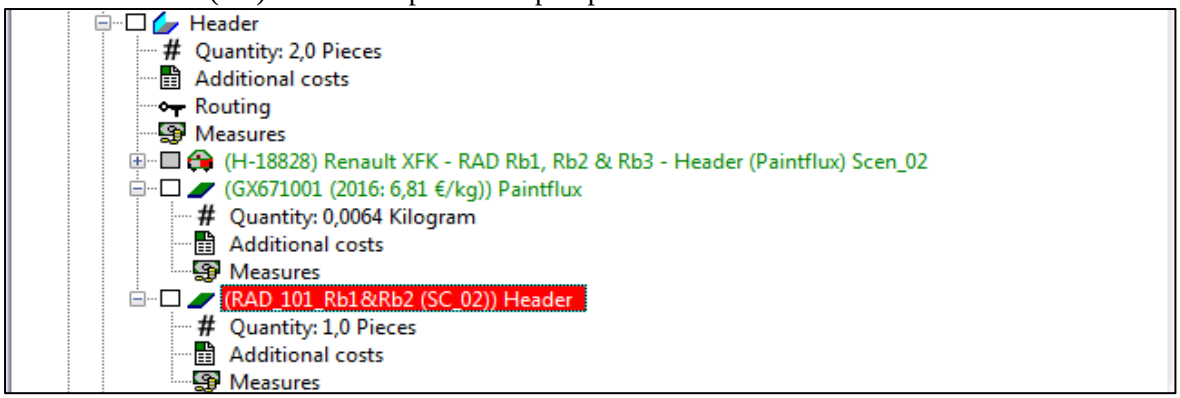
Cost calculation (basic data)

As we know there are surcharges and overhead charges, we need to apply on respective cost factor, in FACTON we have to select and give inputs for the same so than charges can be applied and considered in the costing. In basic data we need to provide inputs like location of project, volume, production group if any, production type code. According to these inputs, surcharges and OH percentage will apply automatically on that specific part.

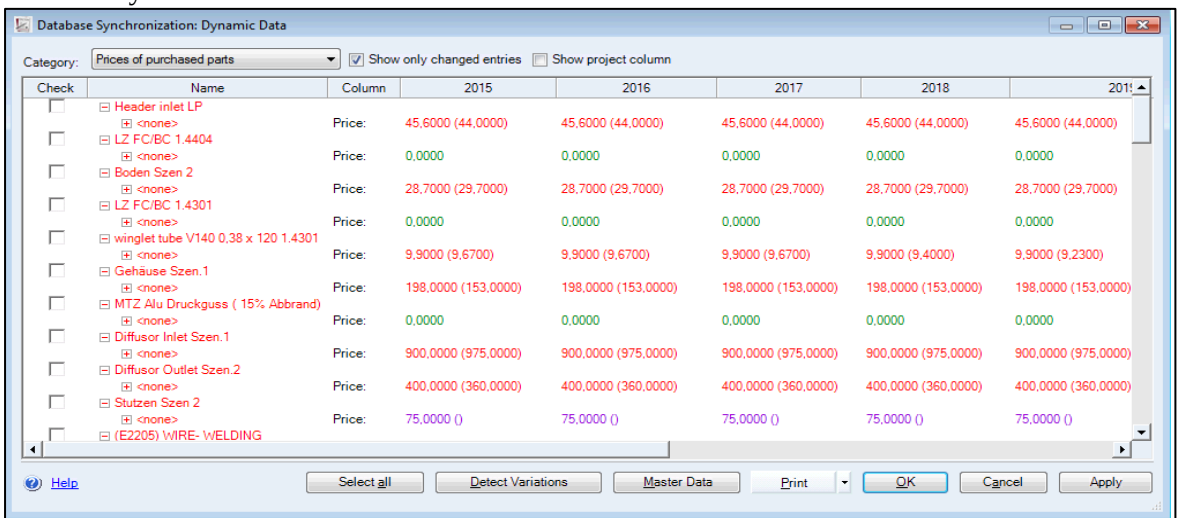
Material Cost calculation in this we provide inputs to get BOM part cost. There are types of part prices like Direct material part price, indirect material, intercompany (if any), other services. While creating database with the help of purchasing matrix we can get the material cost. At the end of output report we can get cost detail as per the classification of part. In FACTON calculation we can pull the part from SAP as well through database. Color coding will help to understand the standard part prices which is available in SAP and in case anyone change that prices, it will reflect with another color. Database sync option is also present to resent the prices.
Prices from database (green) is set if a quote is available from the supplier



Estimation mode (red) is set if the purchased part price is estimated



Database sync



Production Cost calculation

According to routing file we can give the production cost input. In that cost center for the respective machine has also mentioned as well as labor time machine time have also defined. During calculation we need to select the proper machine and labor and then need to give timing for respective factor.Add Production Process, Add Labor and Machine

Timing inputs for Labor and Machine

In case of acquisition and development we need to create new machine rate (MHR), it that case FACTON allow to create new machine rate (MHR) that can be save in FACTON database for future use as well

Additional (Development) Cost calculation

Every project, organization spent an amount of money to develop tools, machines, fixtures for the project. It is nothing but the development cost for that project. In the early stages of a product development process, the estimate of a developing product life cycle cost is the primary information which will be needed to determine the profitability of the product. The more reliable is the cost

estimate process, the more likely the right decision will be made. This has become an important issue for rapid product development.

The additional cost must be splitted into:
- Acquisition cost / reimbursement
- Development cost / reimbursement
- Prototype cost / reimbursement
- Serial Support cost / reimbursement
- Type specific tooling with maintenance
- Type specific tooling w/o maintenance
- Outsourced type specific tooling with maintenance
- Outsourced type specific tooling w/o maintenance
- Direct Sales Cost

There are different scenarios to acquire development costi.e cost bare by Customer or by manufacturer or by amortization etc. So basic data of project (volume) should be well defined as per the year, additional cost will applied throughout the lifetime of project.

In FACTON we can get classified total development cost in terms of its use and its cost per piece at the end of output report

Manage foreign exchange rates,Sales price and Version of Cost calculation

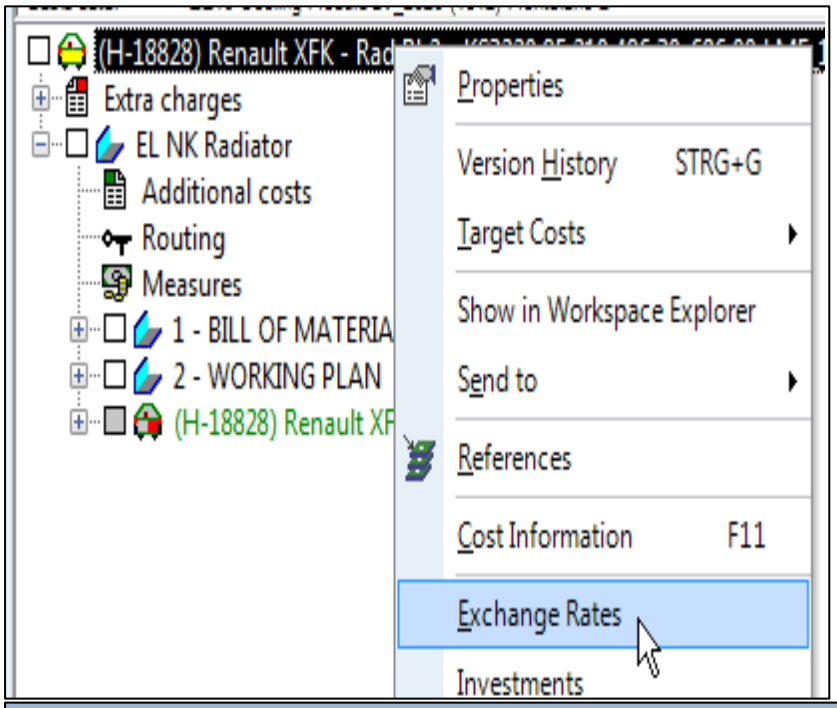
During Cost calculation, procurement is done globally from vendors, supplier across the globe and also customer can be at any location across the globe. So in case of global exchange of calculation and inputs from different vendors to maintain all calculation at one currency, FACTON provide feature regarding foreign exchange rate. That exchange rate can be pulled in database from SAP which is controlled by controlling team. In case of fixed Fx rate defined by supplied, vendor or customer FACTON allow to change the Fx rate as per requirement that specific project.

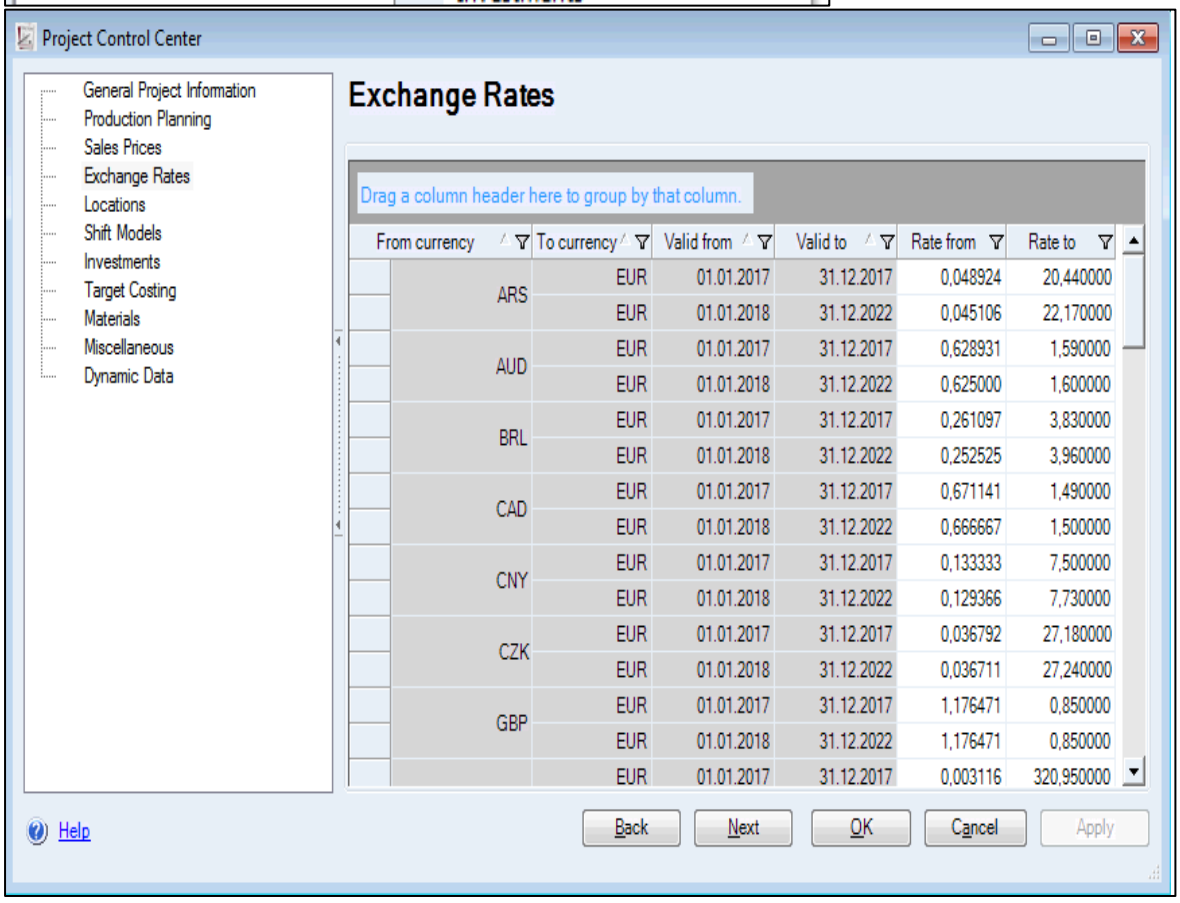
Foreign exchange rates are published by corporate finance in May and August each year Different rates may exist for EcoPlan and StratPlan years

FACTON database is updated with these rates

Acquisition projects need to be synchronised with the FACTON database unless there is an agreement with the customer to use other rates

Exchange rates for development projects should remain unchanged throughout the year and only be synchronised with the FACTON database at the beginning of the following year.


(H-18828) Renault XFK - Rad
Extra charges
EL NK Radiator
Additional costs
Routing
Measures
1 - BILL OF MATERIA
2 - WORKING PLAN
(H-18828) Renault XF
Properties
Version History STRG+G
Target Costs
Show in Workspace Explorer
Send to
References
Cost Information F11
Exchange Rates
Investments


Project Control Center
General Project Information
Production Planning
Sales Prices
Exchange Rates
Locations
Shift Models
Investments
Target Costing
Materials
Miscellaneous
Dynamic Data
Exchange Rates
Drag a column header here to group by that column.
From currency | To currency | Valid from | Valid to | Rate from | Rate to
ARS | EUR | 01.01.2017 | 31.12.2017 | 0,048924 | 20,440000
ARS | EUR | 01.01.2018 | 31.12.2022 | 0,045106 | 22,170000
AUD | EUR | 01.01.2017 | 31.12.2017 | 0,628931 | 1,590000
AUD | EUR | 01.01.2018 | 31.12.2022 | 0,625000 | 1,600000
BRL | EUR | 01.01.2017 | 31.12.2017 | 0,261097 | 3,830000
BRL | EUR | 01.01.2018 | 31.12.2022 | 0,252525 | 3,960000
CAD | EUR | 01.01.2017 | 31.12.2017 | 0,671141 | 1,490000
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GBP | EUR | 01.01.2017 | 31.12.2017 | 1,176471 | 0,850000
GBP | EUR | 01.01.2018 | 31.12.2022 | 1,176471 | 0,850000
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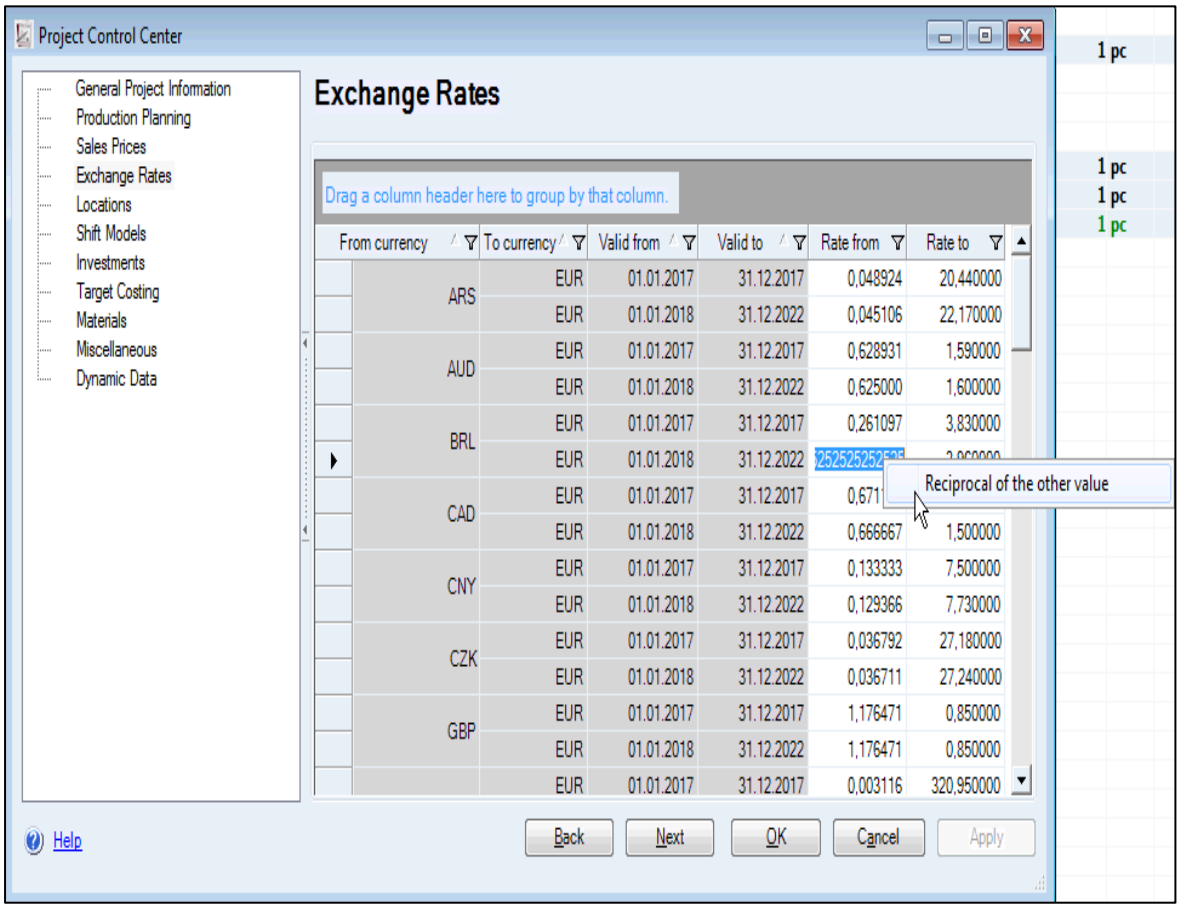
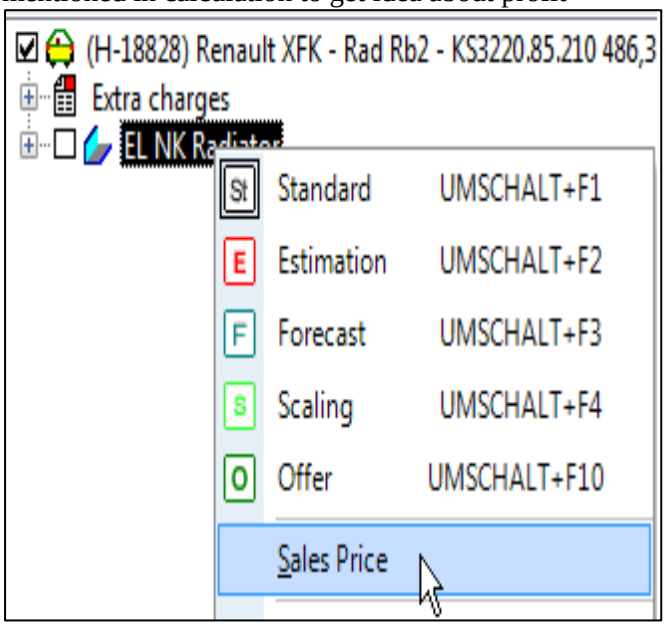
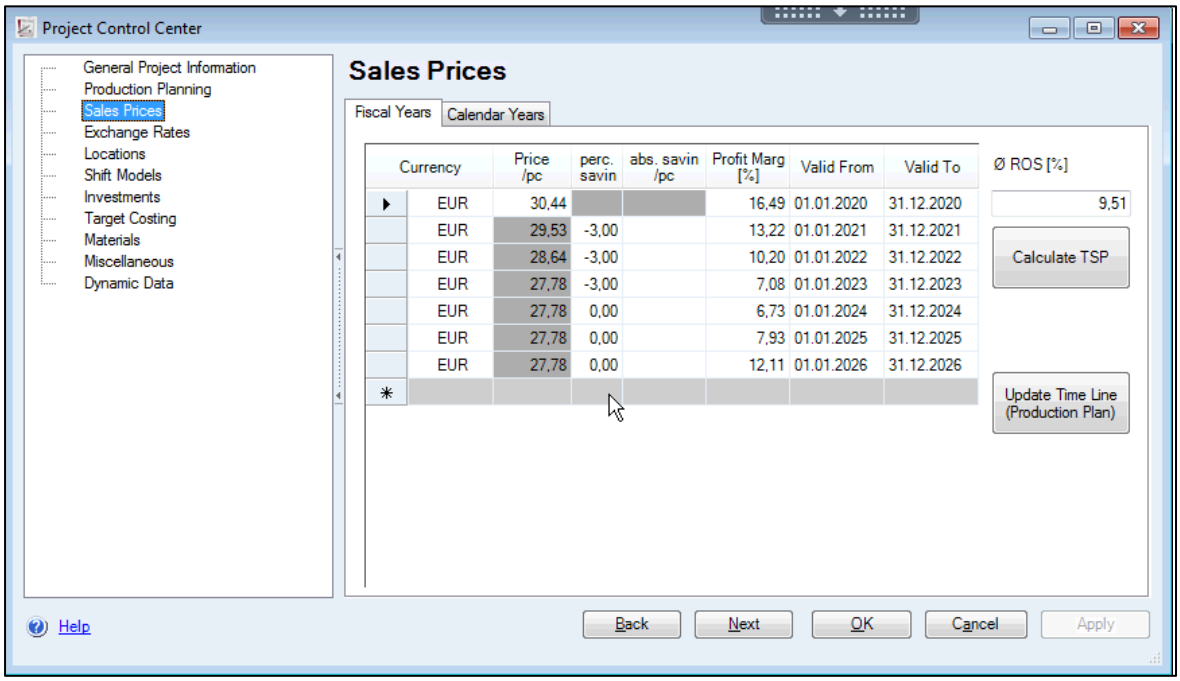
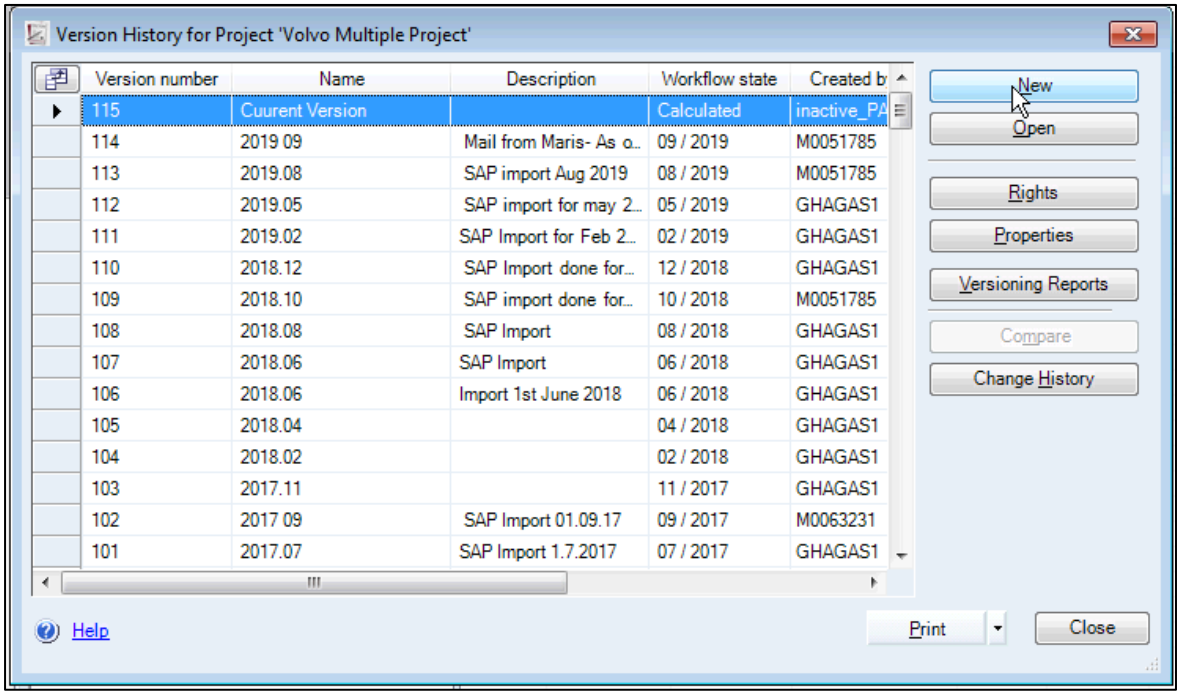


As per cost structure, to calculate the ROS and profit of that respective project Sales price should mentioned in calculation to get idea about profit





After doing all the calculations, to record that specific calculation FACTON allow feature called Versioning. Version can allow to put descriptive information about that specific project calculation. Though version we can store the calculation history and use and refer the history calculation.



Reports

At the end, giving all inputs, FACTON provide reports in Standard format. FACTON can provide different types of reports which is useful to user and convenient to read. It can be available in pdf as well as in excel formats.

Below are main reports to give detail idea about Cost calculation

1. Weighted Average:2. Variant Summery report3. Lifetime calculation:-4. BOM and Routing (Part-list with Process)5. Additional Cost Report

Finding and Conclusion

As per study of both the conventional cost calculation method as well as the cost calculation using FACTON software, below are the points which can help us to understand factors about both methods:

1. Training should require to do cost calculation in case of both SAP and FACTON.
2. To do cost calculation detail knowledge is required about final product, its BOM part and its production process.
3. In case of SAP authorisation is common challenge as the data is highly sensitive and confidential. As at present situation SAP is highly acceptable across the globe, it can be not recommended to provide access of SAP regarding costing to authorities which does not responsible for that directly.
4. In FACTON, we can do the changes and store the calculation. And access is given only to cost estimator.
5. The practice of getting input from different department and put into SAP is not convenient, rather to have proper input format files and to collect at cost estimator then do the calculation in FACTON is much easier.
6. We can get output report in proper format in FACTON that can easily understand.

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