SUCCESSFUL IMPLEMENTATION OF ERP BIG BANG APPROACH AT MECHANICAL ENGINEERING MANUFACTURING INDUSTRY

Vasudevan murthy[1]

Abstract: *GEA Westfalia Separators Bengaluru a 100% Subsidiary GEA Westfalia Separators Germany, Manufacturers of High speed rotating Machines called Decanters / Centrifuges used in the field of separators of liquid-Liquid & Liquid –Solid.*

This paper talks about the Implementation of ERP Package SAP R/3 in GEA Westfalia Separators Subsidiary at Bengaluru works, in the paper we can find how the ***Big Bang*** *approach was perceived and implemented successfully.*

The factors which were critical and influencing the Implementation, the Do and Donts of the Implementation, Tips and tricks of handling the global implementation, synchronising the global process with the process in India etc

The overall success story of the ERP implementation together with post Go-live issues and the procedures adopted to resolve them, Managing and maintaining MRP – Material Requirements Planning, Maintaining the back end settings of MRP etc

In this paper attempt has been made by the Author to highlight the technique adopted at a Mechanical Engineering Manufacturing Industry in Big Bang type approach of ERP implementation – A success story.

The rich domain experience of the author himself was the boon in the above success story and the run thru experience gained along with the implementation run.

We need to understand the any ERP system will follow the Garbage In - Garbage Out Principle, that tells us the importance and need of the quality and ownership of the participants of the Implementation team.

[1] Inter - Company Manager,GEA Westfalia Separator India Pvt. Ltd.,7 - B Bommasandra Industrial Area HebbagodiBengaluru – 560099, vasudevan.murthy@geagroup.com,vasambi@yahoo.com

Reasons for the Issues:

Experts in Industry say that Only 35 - 40 % of ERP implementation Starts Successfully.

Is that we fail in the Start itself? definitely NO, if we understand and give a logical approach to the entire process of Implementation and no doubt learn from others mistakes , we can avoid he repetition at our end the same.

The Implementation of ERP in any Organisation depends on several critical factors.

The factors could be,

- ✓ Will and Involvement of the Top Management,
- ✓ Reorientation and re-tooling of employees,
- ✓ Proper Understanding of the domain function and logical linking with the ERP options available
- ✓ Delivery schedule and the Price of the Implementation.

Every aspect of the above has been dealt in detail in the subsequent pages,

I have attempted to present the paper as simple as possible in three phases:

Phase 1 - Pre Go Live stage

Phase 2 - Go Live Stage

Phase 3 - Post Go Live stage

Phase 1

Pre Go-live

Following sheets pertains to the entire data on the techniques followed during the Pre Go-Live stage

Company background:

The Company in Discussions of this paper is a leading Manufacturer of High Speed rotating Machine used in the field of separation, subsidiary of a Multi National Company Head-quarted at Germany.

The high speed rotating machine used in th field of separation used for separation of liquid-liquid or liquid solid to the extent of 40 % working on the principle of centrifugal separation technology, needless to mention the need of precision and accuracy of the components is the primary requirement.

The machines are supplied across the globe by this EOU unit, which finds application in various sectors of th Industry.Various models are manufactured in the Bengaluru facility, subsequently other models are expected to be added to the production range of Bengaluru facility.

Implementation of ERP Package SAP R/3 in this facility is the focus of the subject case, in the subsequent pages we can find how the **Big Bang** approach was perceived and implemented successfully

Company outlook:

- Centralised Sales-Engineering-Design-Material technology-IT office located at Germany
- Production Bengaluru gets the demand for single parts in synchronisation with machine demand from various Business Lines at Germany.
- The production unit has the state of the Art world class facilities for Machining of Single parts , Assembly and Testing of Decanters
- Components made in India & Imported put to-gether constitutes the complete machine.
- Medium size Global business with 5 Billion Euros from Indian Subsidiary
- 100 employees in Indian Subsidiary
- Multiple Manufacturing location across the globe.
- Components called single parts are outsourced and manufactured at vendors place in India.
- Multiple finished product with a large variety of custom options

The BOM outlook:

- Bill of Materials with approximately 20 levels
- Same part numbers & drawings for all subsidiaries across the Globe

- 20 global suppliers & 30 Indian Approved suppliers
- Components varying from High Precision – Fabricated – stainless steel parts
- Many components made of forgings, Castings are further Processed - precision machined
- Many components are fabricated - Machined & further surface finished
- Surface finish is special acid pickling or special component painted
- Mature product, well established brand name
- Production works on pre-planning machines uploaded in MRP by PPC
- Some times requires to cater the Rush orders with shorter Delivery

Pre - Launch data:

Top management had given the Green go-ahead and the In-house IT department at Germany was a advantageous set-up, with a clear time frame of 4 months.

I had the privilege of heading the SAP Implementation at Bengaluru Facility.

The brightest feather in my cap, while the Implementation was planned in GEA Westfalia was that I was a SAP literate ie SD Trained &this was the second rollout project for me.

The pit falls, Precautionary measures to be taken & the AS IS & TO BE situations were clearly defined, added advantage of mine to speak & write in Deutsche language was exploited to the maximum extent.

We had the following SAP Modules Selected for Implementation:

- Finance & Control **Fi & Co**
- Materials Management **MM**
- Sales and Distribution **SD**
- Production Planning **PP**

Profile of the core team:

A Balanced core team of 5 (Indians) + 1 (German) was constituted by name Krokodil in Deutsche.

The team consisted of:

1 finance domain expert with 3 years of experience

1 Inventory / Material Management domain expert with 3 years of experience

1 Purchase / sales domain expert with 5 years of

1 Vendor Development domain expert with 9 years of experience.

Needless to mention I had the varied-mixed Industry experience of 18 years at the time of Implementation 2008-Sept, ranging from Production–Planning, Technical sales, Projects & Operations !

- Functional consultant of dual expertise in SD & MM from Germany was placed in Bengaluru. Single point Coordinator between India & Germany
- Characterstics of the team Krokodil
-
- The core team was Balanced with Domain specialists in respecive fields.
- Selected the like minded people who knew nothing about SAP !!
- eople who understood the business and its processes, and the technology
- People who were open minded and had no bias about SAP !!
- The hardware and the soft ware requirements were made available Development
- Server & main server were in Germany.
- Implementation Schedule
- 04 months allowed for complete system implementation
- System simulations to be performed in Jan 2007 using mock transactions
- Uploading of data from legacy system to SAP end of Jan 2007
- Go-live in Feb, 2007
- Clear deadlines for the stage was defined & project schedule was in place
- Monitored by the IT chief at Germany & the Directors in India.

Road Map to SAP Implementation

Step  in the Implementation

Project Preparation:

The Initial Project planning:

Sample agenda sheet for the PP module is attached here with, similarly the SD, MM & FI-CO were followed.

Agenda Overview of PP module.doc

The agenda overview For the SD, MM FI-CO were freezed in line with the statutory requirements of the and the regulatory bodies.

- Selected a reputed Indian partner for CIN – Country India Version to synchronization of Indian taxes & Duties components.
- The required formats of out-puts were designed for Government authorities by the above partner.
- They included 1 ABAP programmers & 1 functional consultant dual expert in FICO & PP.
- We were aware that the direct SAP transactions codes would not suffice our requirements.
- ABAP writers were hired from the Indian service provider to create Z transaction codes to meet our cut piece cake requirement.
- The functional consultant from Germany in consultation with Krokodil would freeze the process flow in SAP and send the same via email to Germany.
- The IT team at Germany would try the same transaction code in the Development server and submit the same back to us to check for bugs if any.

Project procedures,

The step – by step approach was followed and the, ONE Classic case is described as follows:

- existing soft ware was parallely used.
- Synchronising the mapping, limitations of SAP and flow of the process were understood in detail, the knowledge transfer to the SAP specialist was the major mile stone successfully covered.
- The manufactured parts had to be sent in and out of the plant for various process operations in India.

- Some times from vendor to vendor directly without entering the premises of the plant to save time.
- In SAP any part moving in and out needs to have a separate part numbers for identification,
- In all the subsidiaries, Out sourcing to the maximum extentwas followed only at Indian subsidiary.
- The parts numbers for all the process stages were needed by India but Design department was not willing to release a separate part number only for India !!
- finally cracked the option of down loading the particular operations on the subsequent vendor and GEA would add the price of the operation in the Purchase order !!for that Vendor !! simpleisn't it ?

Training for Implementation team,

Suitable training for the implementation team was given by the IT colleuges Germany in the form of Audio conference & Video Conference.

The limitations of SAP were made clear to us and it was a two may communication of understanding the requirements of Indian scenario.

I had several brain storming sessions at Germany in Dec 2006 !!

5 visits were made to Germany in both Pre & Post Go-live scenario

Brainstorming session at Germany

The proper understanding about Indian operations with the colleuges in Germany was very important; the knowledge transfer about the process flow and the requirements played an important role in the success of the ERP at GEA.

The limitations of the SAP and its alternative path to enforce the requirements were collectively successfully chased in the same platform.

Project kick –off

The functional consultant from Germany Earmarked for the project India was available in India Bengaluru works the Kick-off meeting was held on Second week of Sept 2006.

Technical requirements & Quality check

- Process flow of the complete cycle was explained to the CIN colleuges and the German IT expert as well.
- The components for the centrifuge was a combination of imported and Indian Manufactured parts.
- The Indian manufactured parts had a requirements of special operations at various vendors places.
- The detailed flow of the parts into Inventory and subsequent issues to assembly and completion of the machine was made clear.
- The mapping was understood clearly by all the stake holders of the project – This was one of the crucial step.
- The check at respective places were clearly defined to avoid errors during the implementation and debacle at the final output !

Step  in the Implementation

Business Blue Print:

Mile stones in the second step are Project Management, Organisational Change

Management, Training, Develop system Environment, Organisation structure definition, Business process analysis, Business process definition & Quality check.

While in the blue print stage the following needs to be taken care:

- Confusion and a general lack of knowledge about the new system throughout the

Organization will be common!

- Luke worm response from within the Organization will be a normal situation.
- Close coordination between the departments like production and inventory control department, as well as the ERP team is to be FORGED well
- When questions are shot during the blue print stage the coordination between the above teams needs to SYNCHRONISHED with collective answers.
- Hand in hand coordination between Domain specialists and ERP specialists is a must.

The basic and clear concepts as follows needs to be honoured:

- Identify Inter departments expectations (for external and internal customers)
- Understand the current processes
- Identify improvement opportunities
- Determine future process vision, targets, and goals.

Step  in the Implementation

Realization:

The mile stones in Third step are Base line configuration and confirmation, Development of

Programmes & interfaces, final integration test & Quality check.

- Always Develop back up strategies and computer infrastructure systems
- Review and understand your current processes and need before defining the need for a system (Choose or design a system around ***your*** business needs)
- Support and drive from executive staff to change corporate culture is a must, and
- Mantra Training, Training, Training is a must !
- Problems like lack of tools for generating necessary reports/ the new system wasn't

Customized to the business is common – needs to addressed.

- Also problems like lack of quantitative measures to assess implementation progresses and the fulfilment of strategic benefits needs to assessed.

Step  in the Implementation

Final Preparation:

The mile stones in fourth step are System Management,

Detailed Project planning, cut over and Quality check, Common mistakes encountered were:

- Data had been inaccurate, incomplete, overlooked or was not entered into the system causing many errors (garbage-in, garbage-out)
- Confidence in the system amongst internal and external customers was undermined
- The data transfer from the Legacy system to the ERP was a critical stage,
- The blue print of the data was verified by members of Inventory, Purchase , and finance including the Managers !!
- The stock data is very important for NOT ONLY the MRP portion of the ERP.
  But for the regular Inventory as well

The stock uploading is one of the critical stage for the healthy running of the system, if at all the data gets mismatched while uploading efforts should be put to correct the same.

In phase II we will see how the INCORRECT data maintenance will cripple the system and defeat the very purpose of the ERP, in particular the MRP portion.

Phase 2

Go-live

Following sheets pertains to the entire data on the techniques followed during the Go-Live is elaborated.

Step  in the Implementation

Go-Live & Support

The mile stones in the Fifth step is to Production support, Project closure & continuous Improvements

- The end user training is one of the major step in the success of the ERP projects, Training manuals, hand outs, reference manuals are required.
- The back end settings and the front end settings needs to be explained clearly
- What needs to be done when the settings are needed to be changed and its impact with results needs to be understood.
- Since Feb 2007 we went live !!thats when our challenges started to pour in !!

User Training & Brain storming on the following points:

• Focus on business processes

– Not on using system, Explain How the existing process are seen thru the ERP system.

• Explain why for every question raised by the end user !!

• Don't skimp on time – work like an Horse !!!

• Show why new system superior to old-Hope the success will follow at your company as well

Benefits of ERP:

- Enhanced empowerment of employees through increased information sharing
- We, GEA India were on par with other subsidiaries across globe !!
- Improved system-wide accountability and visibility
- Transfer prices were more transparent !! between Buyer & seller
- Facilitates the implementation of do it right the first time philosophy
- Improved accuracy of forecasting and master scheduling
- Cross-functional process orientation with high visibility
- Enables exchange of information throughout the supply chain in real time
- Reduced operations costs
- Reduced cycle times of order placement
- Facilitated bottleneck identification and management

Best advantages were seen in the following areas:

- Improved inventory management and inventory cost reduction
- Improved customer service levels, material shortages and reduced late deliveries
- Standardized and normalized data and data formats
- Every Government required format was followed and implemented !!
- Organization and it's supplier chain Manufacturing and sales functions
- Inventory management Product distribution and logistics
- IT function by consolidating and standardizing diverse legacy database platforms.
- The vendor management was better and improved to great heights

ERP Critical Success Factors:

By now one would have understood in brief the success story of Big Bang approach of ERP implementation.

If we need to follow the same at your place, following success factors are absolutely required.

1. Clear understanding – strategic goals

- Clear cut Do or Die goals needs to be focused, no short term goals please !!

2. Top management commitment

- Top management is like the railway engine which needs to have enough power and strength with Destination clarity.

3. Project management implementation

- Professional project Management TEAM should be in place to handle the project.

4. Great implementation team

- Every team member should be highly motivated and made to feel the importance of being the important key stake holder of the project.

5. Cope with technical issues

- Do not shun away from issues, go to the root, Nail at the time will save the wheel !!

6. Organizational commitment to change

- Organization should be receptive to the changes, accept the truth and be prepared to walk with the changed times!!

7. Extensive education & training

- Training !!!training !!!training !!!the mantra needs to be chanted at every step for the success !!

8. Data accuracy

- The data migration from legacy system to SAP and subsequent updations of all the data should be simultaneous and chronological in order other wise the powerful tool like MRP will be like lion with-out teeth !!

9. Focused performance measures

- Performance measures coupled with motivating rewards will be necessary !!

10. Resolution of multi-site issues

- Todays, HIS problem is tomorrows MY problem – attack and solve the issues at other sites and put system in place to share the same at single platform.

In the above case study, we find that the factors which influence the Successful Implementation of the ERP there is a saying that Nail at a time will save the wheel, like wise the SINCERE right effort at the right time will Result in BRIGHT results.

In the next pages we can see what needs to be done to meet the challenges during the Post Go Live Phase Normally the resistance for any change in Industry is common one needs to find their own ways and means to tackle the same.

TOP Management WILL & DETERMINATION !!

A well known Company for Manufacturing of Lubrication system had faced a similar situation of internal resistance, needless to mention the WILL of the Top Management is very crucial for the Success of the ERP so as the Managing Director of the Company was forced to issue an internal Memo to all Employees of the Organisation warning of Termination for Non Co-operation.

From there the next challenge of Migration form Legacy system to the ERP system is important Mile stone, we need to prepare well , well in advance to and well Upto date data ready for Migration.

The basic foundation of Success lies in the Uploading of Correct data which is crucial for the Post Go –Live, Migration portion is very important step that means we need to prepare well and execute the migration operation meticulously.

On job Training is required for every Employee therefore the stage at which the we have now reached is as crucial as the Implementation stage as well . The Basic idea of Interdependency is clearly demonstrated at every s

Phase 3

Post Go-live

Following sheets pertains to the entire data on the techniques followed during the Pre Go-Live stage

The moment the Go live takes place the responsibility of the service provider normally will avail to some more time for solving the teething problems. on ticket solving procedcure.

But it is recommended to form a In house team preferably with members from the implementation.

Further try to add supporting hands based on the size of the company.

The recruits should be with the following two basic qualities :

Rich Domain experience preferably all rounder experience in various departments , if not adequate Orientation to be given.

Maintaining the Cleanliness of the system is very important aspect which needs to be dealt meticulously, the Material master needs to be updated with all necessary data every tab needs to filled in and very time the new part s gets added in!!!!

The MRP – Material Requirements Planning is a very useful tool in SAP to get the max advantage the

This tool, the back end settings are needs to be set in conjunction with the finance module and the Standard Price and Moving Average price needs to be fixed.

The settings like Procurement type,

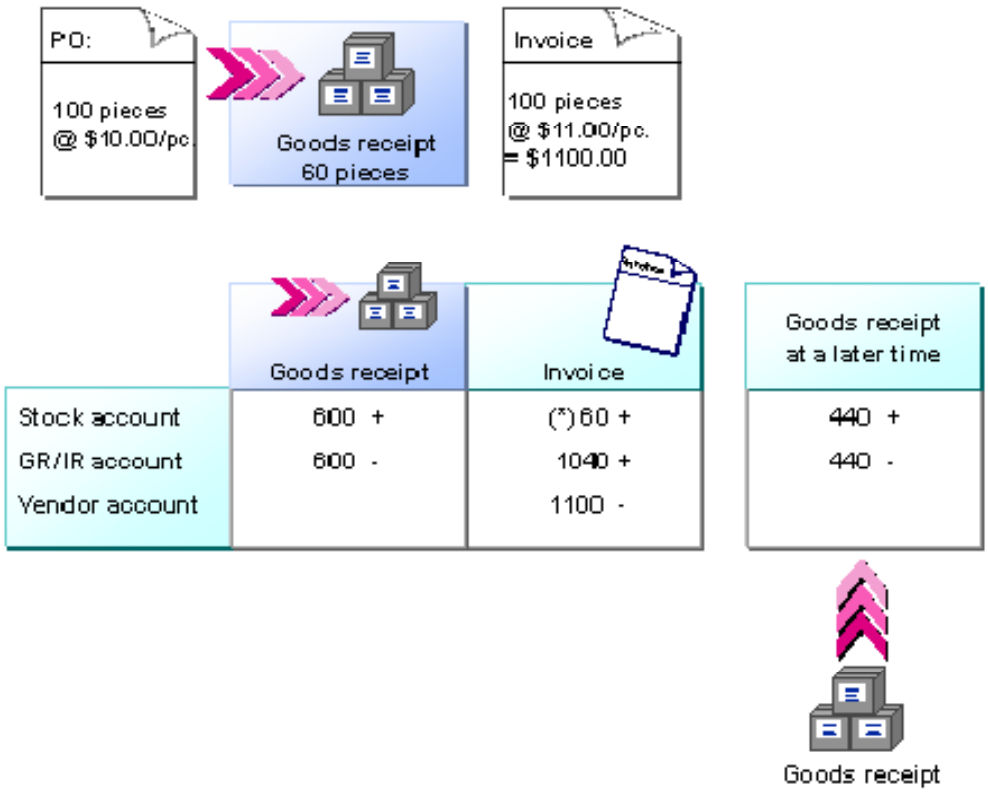
Moving Average Price Vs Standard Price

Moving Average price is the current market price whereas standard price is the fixed price of the material in the Material Master Record.

• In the case of a **material subject to moving average price control**, the stock account can only be debited or credited in accordance with the actual stock level. If the material stock available is less than the quantity invoiced, the stock account is only debited or credited with the invoice difference for the actual stock balance (stock balance x price difference).

• In the case of a **material subject to standard price control**, this posting would be made to the account "Expenses from Price Differences".

Postings in the Case of a Material with a Moving Average Price



Goods Receipt

The material is debited with the purchase order price at goods receipt, that is, with $600 instead of $660.

Invoice Receipt

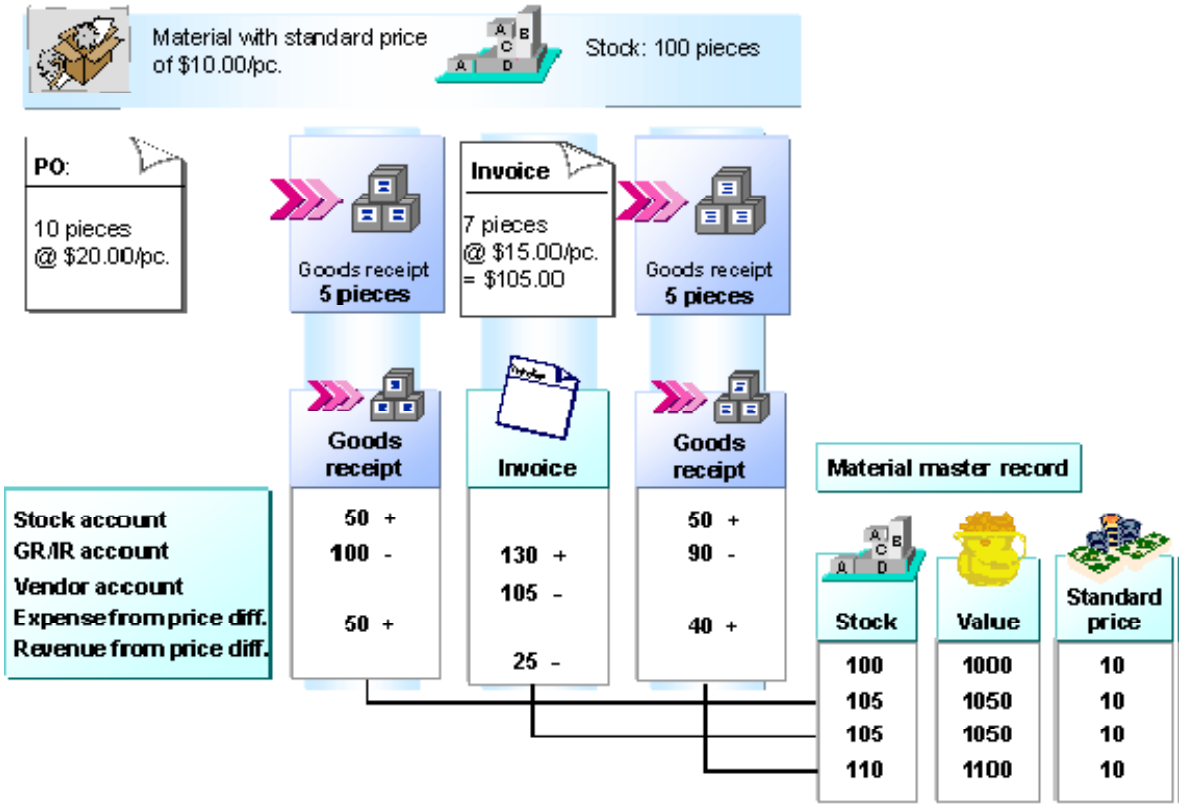
When you enter the invoice, this $60 has to be subsequently debited.

Goods Receipt at a Later Time

The GR/IR clearing account is cleared when the expected goods receipt of 40 pieces for $440 arrives. The offsetting entry is then posted to the stock account.

Example: Material with Standard Price

Postings in the Case of Quantity and Price Variances with Extract from Material Master Record



Goods Receipt

The stock account is posted with the receipt value based on the standard price.

Delivered quantity * Standard price
5 pieces * $10/pc. = $50

The offsetting entry is posted to the GR/IR clearing account based on the purchase order price.

Delivered quantity * PO price
5 pieces * $20/pc. = $100

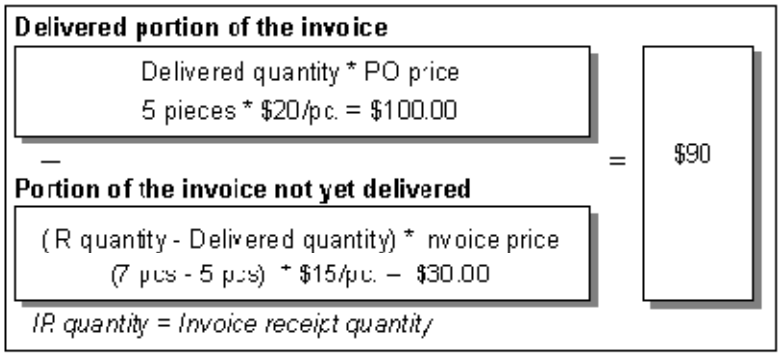
The purchase order price is different to the standard price: The variance between the goods receipt value and the purchase order value is posted to a price difference account.

Value Calculation

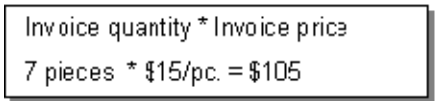
The material price does not change. The stock and value in the material master record increase in proportion to the goods receipt quantity.

Invoice

The invoice quantity is greater than the goods receipt quantity, the GR/IR clearing account is cleared as follows for the portion of the invoice that has already been delivered and the portion that has not yet been delivered:



The offsetting entry is posted to the vendor account based on the invoice price:



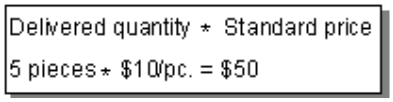
A goods receipt is still expected for the invoice. The invoice price is different to the purchase order price: Therefore, the system makes a correction posting to the price difference account at invoice receipt.

Value Calculation

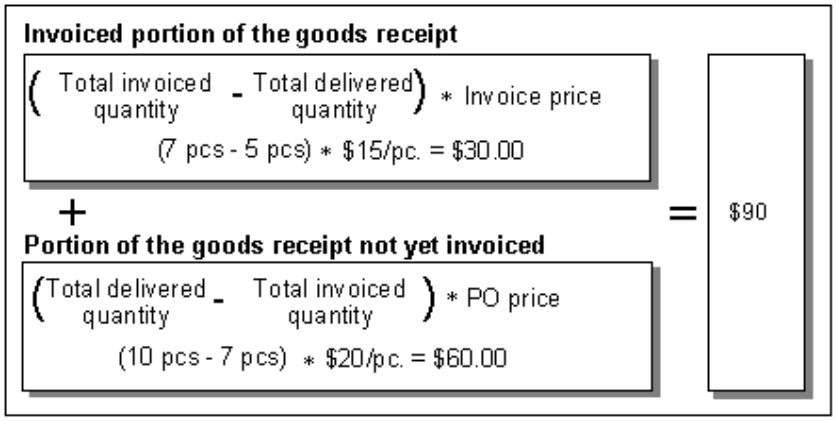
The material price, stock, and value in the material master record remain unchanged.

Goods Receipt

The goods receipt quantity is greater than the invoice quantity. The stock account is posted with the receipt value based on the standard price.



The GR/IR clearing account is cleared as follows: The invoiced portion is valuated at the invoice price; the portion that has not been invoiced yet is valuated at the purchase order price:



The difference between the stock account and the GR/IR clearing account is posted to a price difference account.

Value Calculation

The material price does not change. The stock and value in the material master record increase in proportion to the goods receipt quantity.

Below are the transactions which are used in the integration of postings to FI :

Expenditure/income from transfer posting (AUM)

This transaction is used for transfer postings from one material to another if the complete value of the issuing material cannot be posted to the value of the receiving material. This applies both to materials with standard price control and to materials with moving average price control. Price differences can arise for materials with moving average price if stock levels are negative and the stock value becomes unrealistic as a result of the posting. Transaction AUM can be used irrespective of whether the transfer posting involves a transfer between plants. The expenditure/income is added to the receiving material.

Exchange rate differences in the case of open items (KDM)

Exchange rate differences in the case of open items arise when an invoice relating to a purchase order is posted with a different exchange rate to that of the goods receipt and the material cannot be debited or credited due to standard price control or stock under coverage/shortage.

Price differences (PRD)

Price differences arise for materials valuated at standard price in the case of all movements and invoices with a value that differs from the standard price. Examples: goods receipts against purchase orders (if the PO price differs from the standard price), goods issues in respect of which an external amount is entered, invoices (if the invoice price differs from the PO price and the standard price). Price differences can also arise in the case of materials with moving average price if there is not enough stock to cover the invoiced quantity. In the case of goods movements in the negative range, the moving average price is not changed. Instead, any price differences arising are posted to a price difference account. Depending on the settings for the posting rules for transaction/event key PRD, it is possible to work with or without account modification.

Revenue/expense from revaluation (UMB)

This transaction/event key is used both in Inventory Management and in Invoice Verification if the standard price of a material has been changed and a movement or an invoice is posted to the previous period (at the previous price).

Expenditure/income from transfer posting (AUM)

This transaction is used for transfer postings from one material to another if the complete value of the issuing material cannot be posted to the value of the receiving material. This applies both to materials with standard price control and to materials with moving average price control. Price differences can arise for materials with moving average price if stock levels are negative and the stock value becomes unrealistic as a result of the posting. Transaction AUM can be used irrespective of whether the transfer posting involves a transfer between plants. The expenditure/income is added to the receiving material.