The level contains many tools that are available in many forms like reports, graphics, chart builders and web page which can be integrated into an organization portal.
The implementation of the software tool have the ability to provide the Optimal data sets with effective and accuracy of data and allow managers to view data in different perspective, to drill-down and roll-up to aggregate levels, to navigate and on-line query data sets in order to discover new factors that affect business process and also to anticipate and forecast changes inside and outside the organization. In the below Enterprise Resource Planning (ERP), the methodology of soft computing algorithm is implemented in the MIDDLE LEVEL and the results will be in TOP LEVEL.

TOP LEVEL

The top-tier methodology is based on the overall design of the data warehouse, and is therefore more systematic. However, it implies longer development times and higher risks of not being completed within schedule since the whole data warehouse is actually being developed.

MIDDLE LEVEL

The middle level methodology is based on the overall design of the data warehouse, but then proceeds with a prototyping approach, by sequentially implementing different parts of the entire system. This approach is highly practical and usually preferable, since it allows small and controlled steps to be taken while bearing in mind the whole picture.
The bottom level method is based on the use of prototypes and therefore system extensions are made according to a step-by-step scheme. This approach is usually quicker, provides more tangible results but lacks an overall vision of the entire system to be developed.

5.1 BUSINESS INTELLIGENCE IN MATERIAL MANAGEMENT

Effective inventory management concerned about the delivery of the right information at the right time at right location to satisfy the need of the customer at minimum cost. Implementing an inventory improvement solution driven by business intelligence can help retailers to improve their business in five key areas: assortments, replenishment, vendors, supply chain and markdowns. Detailed data related to physical and calculated inventories, inventory receipts and adjustments, supplier shipments and intra-enterprise item movements, sales, plans and forecasts, replenishment targets and
safety stocks gathered in a centralized data repository serve as the foundation for the solution.

The importance of inventory management and how best-in-class retailers are utilizing business intelligence to analyze information and internal operations to improve the efficiency of inventory throughout the enterprise in order to:

• Conduct detailed, in-depth analysis of historical sales transactions, better anticipate demand, and relate their stocking positions to both short and long term trends.
• Accurately track inventory throughout the entire supply chain from order through distribution centers to stores and to the sales floor.
• Develop and leverage fact-based analytical models of customer behavior to understand the factors that influence sales.

5.1.1 SOFTCODE MATERIAL MANAGEMENT

Softcode material management consists of the following Transactions and Reports:

Purpose is to maintain transaction History, Account posting And to maintain Stock Ledger.

5.1.2 RAW MATERIALS AND COMPONENTS

• Goods receipt - this transaction is recorded through Goods Receipt Note(GRN).
• Goods Issue – this transaction is recorded through Goods issue slip.
• Inter Warehouse transfer – transaction is recorded when goods are transferred from one location to another.
• Adjustments – transaction is recorded to make adjustments for lost goods or extra found.

5.2 INDENT

The Indents for purchase of materials is raised by the department concerned or any agency within the organization authorized to raise the indent. These Indents are prepared in the format designed by the organization. The Indent carries a unique identification number and is also checked for its correctness by the higher authorities within the department, usually the head of the department. Appropriate ways are devised to keep a watch on everything and ensure ourselves all are on right track.

In the indent, the Indenter gives complete information with respect to the description and specification of the materials to be produced in addition to the description of the jobs to be executed, along with the materials to be supplied and equipment. For an item to be supplied, the quantity along with detailed specifications and drawing number etc., are given in the indent. Similarly, for the equipment to be deployed the desired capacities of the equipment, their ownership, procurement through rent/lease, etc., are specified in the Indent. The overall quality of the jobs to be executed along with the expected performance efficiency are also mentioned in the indent.

FLOW DIAGRAM
Figure 5.2 Material Management Flow Diagram

Normally the specifications given are standard ones conforming to national or international standards organizations such as International Plant Propagators Society (IPPS), PS, International Space Station (ISS). Wherever required, additional information in the form of manufacturing drawings, a check-list for special packing instructions,
matching/ complementary parts of the equipment/ assembly, etc are enclosed in adequate numbers with the indent.

In some organizations, especially bigger ones, the cost estimates also form part of the indent and as such it should be done by the concerned person who is in charge of preparing it in the organization. Estimated values provide a basis for examining the reason that stand behind the prices, fixed by the organization.

5.3 PURCHASE

The purchasing department receives a list of raw materials and services required by the production department to complete the customer’s orders. The purchasing department sends purchase orders to selected suppliers to deliver the necessary raw materials to the manufacturing site on the required date. Internal procurement begins with the generation of a purchase requisition. In the materials planning areas, the system should have the facility to draw up its own requisition automatically when situation warrants. If a need arises in other areas of the enterprise, the relevant purchase requisition has to be created manually.

PURCHASE ORDER (PO)

This module is used to create purchase orders for procuring supplies for the organization based on user requisitions. The user can create four types of Purchase Orders:

GENERAL PURCHASE ORDER

In this type of PO, rate, type and quantity of the item may be defined but the time limit in terms of validity or delivery period may or may not be defined.
RATE CONTRACT PURCHASE ORDER

Under this the pre contracted rate, quantity and time limit (for receiving the purchase order items) all are defined. This PO. is also issued to those vendors who have valid rate contracts from the organization for the ordered items.

CONSIGNMENT

This type of Purchase order is created only when an item (Consignment item) is consumed. The PO is generated on every consumption or as per the parameter set by the user.

PO VALIDATIONS

The purchase orders can only be issued when an authorized person validates it. The validation levels can be multiple. Each and every level has its own limits for the amount of PO the user can validate in a given period. User can also mention the additional charge details in a separate sheet, which the organization must keep in mind while making the purchase.

5.4 GOODS RECEIPT NOTE (GRN)

The system has the provision to receive goods against purchase order, or remitting hot cash on the spot or preferring, credit purchases and some time without purchase order. Goods can be received in any store.

Once the GRN is created the item is taken into the stock. User can also use the system to view all the existing good received note details in the module. The system can also create GRNs for consignment items. The GRN number can either be manual/auto generated or a combination of both.
In the GRN one can also maintain information about the goods, offered free of cost, which generally come free along with the main items as part of promotional schemes.

Once the GRN is entered and saved, it has to be validated before it affects the material in the system. There is a provision of cost sheet, which shows the additional expenditure incurred in procuring the items by the way of taxes, freight, customs, transportation etc. There is a provision to enter gate pass number at the time of creating a GRN.

The goods receipt triggers the following activities:

- Quality inspection.
- Placement of Material into storage.
- Settlement with regard to the goods received.

5.5 INVOICE VERIFICATION

Settlement with regard to the materials that you withdrew from consignment stock is carried out without an invoice having been received from the vendor. Invoices are created in the system from the list of withdrawals from consignment stock. The vendor then receives payment based on these invoices. The invoices created in this way do not refer any purchase orders or goods receipts.

5.6 GOODS ISSUE

Whereas long-term sales planning tasks, for example customer segment analysis, market research, and product planning, are in the Product Development and Marketing Environmental Protection Agency(EPA), the Sales EPA includes Planning and controlling sales channels, Advertising, Processing customer inquiries and quotations,
Order processing including Pricing, Delivery processing including Picking, and far as Goods issue checking as far as Billing.

Customers of short-life consumer goods receive standard price quotations. Prices for long-life consumer goods are often calculated in response to customer inquiries, using standardized modules.

**STOCK**

Stock\[opening stock + goods received-goods issue\]

There are three types of stock that a business can hold:

**Stocks of raw materials** (inputs brought from suppliers waiting to be used in the production process).

**Work in progress** (incomplete products still in the process of being made).

Stock available in Production, subcontracting locations (warehouses) come under this category: Receipts for these areas are taken from Issues from primary warehouses covered in GRN, Issue tables. Issue from these locations are taken from finished goods handing over/Inspection tables or directly from Despatch tables (DcHdr, Dcdtl) based on Company practice. For Subcontract Header table (SCHdr), Subcontract Detailed table (SCDtl) tables are used.

The system provides for multi location stocking where the same item can be stored in different locations. It covers Work in progress (WIP) stock maintenance and provides operation wise stock in manufacturing and construction areas.

**5.7 WORK IN PROGRESS STOCK LEDGER**

WIP (work in progress) stock is required to ascertain details of the stock of items lying in various stages of production in the shop floor or with job workers (Subcontractors).
ITEM PROCESSING
Normally in a production environment an Item may have to go through different processes before coming out as Finished Product. For achieving this, the following are required:

- **Process Master** is to be created defining the Process Code and Process description.

- **Identification of Item** at various Process stages. The Item Code should change, when items move from one Process to another Process. In Softcode itemcode structure is changed as follows. To the Raw material/Component Item Code the completed Process code is suffixed to indicate the Processes completed.

  For example in the case of an Item the /Component Code is 80310905229 and in the event of undergoing the process of cutting, the component code is changed to 8031090522CUT: once the process is completed, the lost three digit which is suffixed must indicate the completion of the process.

  This way the coding is to be changed and when the Item goes through various stages the stock is to be updated to indicate the stock in various stages.

  Stock ledger is maintained in the same way as the Raw material or Components excepting the following transaction logic.

  Issue for both Sub contractor and Shops is done through IssueHdr and IssueDtl tables. Finished item from Subcontractor is received in SCHdr and SCDtl tables or in the GRNHdr/GrnDtl tables.

  Finished items from Shop is transacted (dispatched) at DCHdr/DCDtI tables. It may be in more number of tables in some client locations where intermediate stages are recorded. Through union queries it is brought to a Virtual Stock Views for further processing.

![Figure 5.3 Stock Ledger](image-url)
Updation of Stock tables during Work in progress transactions Situations

- One to One with only Process addition
- One to Many –One item comes back as many components
- Many to One –Many items are supplied to be returned as one assembly

This situation is handled using Bill of material table where relationship between finished items and input items are maintained.

WAREHOUSES AND WAREHOUSE CODES

Each store will be a warehouse and assigned a Warehousecode. In the case of job work (Subcontracting), the vendor himself is taken as warehouse. In the case of Shop production, A stage of production or a department/section processing can be taken as warehouse.

CONTRA RECEIPT/ISSUE

When an item is issued from one warehouse to another warehouse and when its stock is to be tracked in the subsequent warehouses then contra records are created. A contra entry is a double entry transaction like accounting debit/credit entries. When an item is issued in one warehouse, in the contra entry it is automatically made in its receipt entry in the next warehouse to which the item is transferred. Same process is applicable for Receipt also.

VIRTUAL ISSUE/RECEIPT

When issues are made as components and receipt is made in Assembly which contain the components then BOM (Bill of Material) is required breaking the assembly into components. Virtual Issue/receipt is an equivalent component transaction. When an assembly is received, the contra transaction made will be a Virtual. This virtual contra
transaction will be for the warehouse from where the assembly has come. In the case of subcontractor, the subcontractor (edgeraccount) himself will be the warehouse.

**ISSUE OF ALTERNATIVE ITEMCODES**

Alternative ItemCodes are issued when Bill of Material Detailed Table (BomDtl) items are not available. BomDtl table has a field Alternate to where alternate items are linked. Stocks of finished products (finished goods of acceptable quality waiting to be sold to customers).

The aim of stock control is to minimize the cost of holding these stocks whilst ensuring that there are enough materials for production to continue and be able to meet customer demand. Obtaining the correct balance is not easy and the stock control department will work closely with the purchasing and marketing departments.

The marketing department should be able to provide sales forecasts for the coming weeks or months this well designed systems provide flexibility to absorb the stock demand variation, and enable purchasing to plan ahead, practice, forward buying, and so forth. An organization usually has different types of stores like which it refers by different names on the basis of material nature such as:

Raw Material can be difficult if demand is seasonal or prone to unexpected fluctuation) and so allow stock control managers to judge the type, quantity and timing of stocks needed.

It is the purchasing department’s responsibility to order the correct quantity and quality of these inputs, at a competitive price and from a reliable supplier who will deliver on time.

As it is difficult to ensure that a business has exactly the correct amount of stock at any one time, the majority of firms will hold buffer stock. This is the “safe” amount of
stock that needs to be held to cover unforeseen rises in demand or problems of reordering supplies.

5.8 STOCK MANAGEMENT

Good stock management by a firm will lower costs, improve efficiency and ensure production can meet fluctuations in customer demand. It will give the firm a competitive advantage over the situation where more production can lead to lower prices and also customers should always be satisfied as products will be available on demand. However, poor stock control can lead to problems associated with overstocking or stock-outs.

If a business holds too much buffer stock (stock held in reserve) or overestimates the level of demand for its products, then it will overstock. Overstocking increases costs for businesses as holding stocks are an expense for firms for several reasons.

- Increases warehouse space needed
- Higher insurance costs needed
- Higher security costs needed to prevent theft
- Stocks may be damaged, become obsolete or perish (go out of date)
- Money spent buying the stocks could have been better spent elsewhere

A typical store has a process and a sufficient space within, to receive the incoming materials, keep them as long as they are required for use and then move them out of stores for use. In a manufacturing firm this process forms a cycle to maintain and run the activities of stores. The basic responsibilities of the store are to act as custodian and controlling agent for parts, supplies, and materials, and to provide service to users of those goods.

- Store
• Processed or Semi-Finishing Materials Store

• Finished Goods Store

• Yard Store

5.9 SUMMARY

The fine amalgamation of BI with softcode give birth to a new hybridization which has a remedy for all the ills, we are facing from material management deliver to a finished goods to customer. The hybrid stretching its helping hand to cover all the intermediary store that crop up between material management and the delivery of finished goods to customer. The solution provided by the hybrid help us the to streamline and make better co-ordination and harmonious relationship among various intermediary step like assortment, replenishment, vendor, supply chain management and markdown. Its tentacles are further stretched to embrace like other subsidiary area like physical and calculated inventories, supplier shipment, intra enterprise item movement, sales plan, forecast and safety stock. Even administrative bottleneck that any organization face in the area such as purchase indent creations, Good Receipt Note (GRN), invoice verification and good issue, are taken care of well by the BI and Softcode.