1. **Improved customer service**
   - Products are made available (on-hand) when customers need them
   - This contributes to reducing lead time (LT)

2. **Reduction in inventory investment**
   - The reduction is far more significant for raw materials, parts, and subassemblies with dependent demand than for end items with independent demand.

3. **Improved plant operating efficiency**
   - Based on the philosophy of producing the right amount at the right time.

---

**Inputs for MRP System → Three of them!**

1. **Master Production Schedule (MPS)**
   - MRP assumes that the MPS for a product is given. It also assumes that there is adequate capacity available for producing the MPS.
2. Bill of material (BOM) file

It is a list of components, parts, and subassemblies that is required to produce a unit of end item. Also called the product structure file or the indented parts list.

3. Inventory Status file

It is a complete record of each item held in inventory. Although each raw material or part may be used at different levels in one or more products, there is only one material record for each item. The following details have the following details:

- Low-level code (lowest level at which the material is used)
- Inventory on hand
- Items on order, and
- Customer orders for the item.

The above + items in a material record are updated as and when inventory transactions such as receipts, disbursements, scrap, spoiled materials, and planned orders, and order release occur. A few other pieces of information:

- Lot sizes
- Lead times
- Safety stocks
- Scrap rates
Parts/Components

Replacement parts

- These parts are purchased directly by customers.
- Supplies are made directly from inventories.

Service parts

- Forecasts for these parts are available to the company.
- Included in the MPS.

Q: How does the MRP system work?

A:

1. Determine the number of end items required (by each time period) from the MPS end item at level 0.

2. Gross Requirement (G.R) at level 0 = \[\text{Units of each MPS + service parts; if it is used as a service part} \]
   \[\text{MPS; otherwise} \]

3. Net Requirement (N.R) also called the planned order receipts (P.O.Re.)
   \[\text{Inventory on hand - SS - Inventory allocated for other uses or replacement parts} \]
4. Offset the planned NRs evaluated in step 3 to allow for production, which then becomes the planned order releases (P.O.Rls.) for the end item.

5. \[
GR_{\text{Level 1}} = \begin{cases} 
\pi_1 \times \text{P.O.Rl. Level 0} + \text{service parts} & \text{if } \theta \text{ is used as a service part} \\
\pi_1 \times \text{P.O.Rl. Level 0} & \text{otherwise}
\end{cases}
\]

Repeat this procedure until the requirements for all r.m.s., parts, and subassemblies, and the end item are determined.
Indent BOM

A
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<thead>
<tr>
<th>B(2)</th>
<th>H(3)</th>
<th>E(2)</th>
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<tbody>
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<td>F(1)</td>
<td>G(3)</td>
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<td></td>
<td>F(1)</td>
<td></td>
</tr>
</tbody>
</table>

0 1 2 3
Level code

0

1

2

3

4

Tree structure

A

B(1)

C(1)

D(4)

E(2)

F(1)

G(3)

H(1)

I(3)

J(1)