Constructing and Implementing the Layout plan
Layout plan

- Layout plans are detailed representations of facilities.
- The representation:
  - Two dimensional and drawn by hand, constructed with templates or drawn by computer
  - Three dimensional and consist of modular building blocks or detailed models.
Constructing a Layout Plan

- Prior to beginning the construction of the layout plan, the following data must be gathered.
  1. A department layout that has been developed using appropriate layout techniques.
  2. The department and area requirement sheets for each department
  3. The material handling planning charts for each product to be manufactured.
The layout plan should be constructed using systematic procedure.

The systematic procedure for a manufacturing facility is:

1. **Select the scale**: should be selected so that the overall facility configuration, the department layout, and the available layout planning equipment fit appropriately.
2. Decide on the method of representation: should be selected so that the overall facility configuration, the department layout, and the available layout planning equipment fit appropriately.

3. Obtain layout plan supplies and/or hardware and software.
4. (For an existing facility) locate all permanent facilities on the layout plans: all columns, windows, doors, walls, ramps, stairs, elevators, cranes and other permanent fittings should be the first elements placed on the layout plan heights should be recorded on layout plans for existing facilities.

5. Locate the exterior wall that includes the receiving function.
6. (For nonexistent facilities) Locate all columns.
7. Locate all manufacturing departments and equipment: beginning with receiving, each department should be tentatively located in the layout plan based on the department layout.
8. Locate all personal and plant services.
9. **Audit the layout plan**: prior to finalizing the layout plan, it should be audited from both the material and personnel perspective.

- The material audit should involve tracing all material flows through the facility, material handling, storage, operation and inspection.

- Personnel audit should involve tracing the tasks performed by every person to be employed within the facility.
**Example:** a production workers efforts should be traced through at least the following activities.

| 1. Park automobile                      | 11. Get a drink of water |
| 2. Walk into facility                   | 12. Take a break         |
| 3. Hang up coat and store lunch         | 13. Go to lunch          |
| 4. Sign in                              | 14. Meet production meeting |
| 5. Talk with supervisor                 | 15. Interact with production and quality control |
| 7. Begin production                     | 17. Wash hands           |
| 8. Handle machine breakdown             | 18. Retrieve coat        |
| 9. Handle machine setup                 | 19. Sign out             |
| 10. Go to rest room                     | 20. Return to automobile |
10. Finalize the layout plan: once the layout plan is fully audited, it should be finalized by permanently locating everything on the layout plan.
While developing the layout plan the majority of data used and assumptions made will be questioned repeatedly.

Much iteration will be necessary and many trial and error attempts will be made before obtaining an acceptable layout plan.
Selection of plant layout

- Every layout plan has intangible costs which to all intents and purposes cannot be measured in terms of Birr and Cents.
- There are a number of ways by which the selection of a good plant layout can be done.
  - Balancing advantages against disadvantages;
  - Cost comparison and justification; and
  - Factor analysis rating.
Balancing Advantages against Disadvantage

- The easiest way of evaluating method.
- It is also the least accurate; therefore, it is used more for preliminary screening out of rough alternatives.
- This pros and cons system involves merely listing in columns to each other all the advantages of each alternative, below them are listed the disadvantages.
- This simple comparison is surprisingly effective and certainly is not a time consuming procedure.
Cost Comparisons

- A more economical approach to the evaluation problem is cost comparison.
- Establishing the total factory cost of a product and added investment for machine tools, a comparison between alternatives is possible.
- In preparing a cost analysis, there are basically two approaches:
  - Consider total cost involved or
  - Consider only those costs that will be affected by the project under considerations.
A systematic way of classifying cost elements and accumulating cost figures are required.

- prepare a worksheet(s) that picks up investment requirements for each alternatives;
- prepare a worksheet that establishes operating cost estimates, and
- make calculations to compare and justify expenditures for alternative layout plans.
Factor Analysis

- Follows the engineering concept of breaking down the problem into its elements and analyzing each one.
- It is merely a technique of ranking procedure with various considerations weighted according to their importance.
- The overall desires of what is wanted in layout being planned are broken down into so-called factors or considerations.
The most commonly involved factors or considerations are:

- Ease of future expansion
- Adaptability and versatility
- Flexibility of layout
- Flow of materials effectiveness
- Materials handling effectiveness
- Storage effectiveness
- Space utilization
- Effectiveness of supporting service integration
- Safety and housekeeping
- Working conditions and employee satisfaction
- Ease of supervision and control

- Appearance, promotional value, public or community relations
- Quality of products
- Maintenance problems
- Fit with company organization structure
- Equipment utilization
- Utilization of natural conditions or surroundings
- Ability to meet capacity or requirements
- Investment or capital required and
- Savings, payout, returns, profitability, etc.
Implementation plan

➢ The most important section in the layout planning.

➢ It describes the specific activities and the dates for completing the activities required to fully implement the facility plan as described in the report.