Imagine that you bought a new flat without walls inside (open plan). You need to plan and estimate apartment renovation and tell when you could live in this flat. Consider you want to have a separate bedroom; the walls should be painted except the restroom; you should think about the furniture and other elements for comfortable living.

**Tasks**

* Create WBS (not less than 10 items) – 10 points
* Estimate each item in WBS in days and assign required resources – 10 points
* Define dependencies between items in WBS – 8 points
* Identify critical path – 8 points
* Draw a Gantt chart and say when you could start living in your new flat – 10 points

Create WBS (not less than 10 items)

**1. Planning and Design**

* Measuring the entire flat space
* Planning and design the layout
* Consulting with an architect or interior designer

**2. Demolition and Site Preparation**

* Clear the flat of any debris or existing structures that need removal

**3. Structural Changes**

* Erecting walls for the bedroom and any other partitioned spaces
* Installing door frames and doors for the new rooms

**4. Electrical Work**

* Planning the new electrical layout
* Rewriting or adding new electrical lines as per the new layout

**5. Ventilation**

* Installing new ducts or vents

**6. Wall Painting**

* Plastering and smoothing the new walls
* Applying primer to the walls
* Painting the walls with the chosen color

**7. Flooring Installation**

* Choosing flooring materials
* Installing in each room.

**8. Kitchen and Bathroom Installation**

* Installing kitchen cabinetry and countertops
* Installing kitchen appliances
* Installing bathroom fixtures

**9. Furnishing and Interior Decoration**

* Selecting and purchasing furniture for each
* Installing lighting fixtures

**10. Final Inspections**

* Performing a deep cleaning

**11. Moving In**

* Arrange for moving and transportation of personal belongings
* Unpack and set up each room for functional living

Estimate each item in WBS in days and assign required resources

|  |  |  |
| --- | --- | --- |
| **Item** | **Estimated Time (Days)** | **Required Resources** |
| 1. Planning and Design | 7 |  |
| Measuring the entire flat space | 1 | Project Manager, Architect |
| Planning and design the layout | 3 | Architect, Interior Designer |
| Consulting with an architect or interior designer | 3 | Architect, Interior Designer, Contractor, Electrician, Plumber |
| 2. Demolition and Site Preparation | 2 |  |
| Clear the flat and remove debris | 2 | Demolition Crew, Waste Disposal Team |
| 3. Structural Changes | 8 |  |
| Erecting walls for new spaces | 5 | Contractor, Construction Workers, Carpenter |
| Installing door frames and doors | 3 | Carpenter, Construction Workers |
| 4. Electrical Work | 4 |  |
| Planning the new electrical layout | 1 | Electrician |
| Rewriting or adding new electrical lines | 3 | Electrician, Laborers |
| 5. Ventilation | 2 |  |
| Installing new ducts or vents | 2 | Specialist, Laborers |
| 6. Wall Painting | 4 |  |
| Applying primer to the walls | 1 | Painter |
| Painting the walls | 3 | Painter, Laborers |
| 7. Flooring Installation | 5 |  |
| Choosing materials for floor | 1 | Homeowner, Interior Designer |
| Installing flooring in each room | 4 | Flooring Specialist, Carpenter, Laborers |
| 8. Kitchen and Bathroom Installation | 7 |  |
| Installing kitchen cabinetry | 3 | Kitchen Specialist, Carpenter, Laborers |
| Installing kitchen appliances | 2 | Electrician, Kitchen Specialist |
| Installing bathroom fixtures | 2 | Plumber, Laborers |
| 9. Furnishing and Interior Decoration | 5 |  |
| Selecting and purchase furniture | 2 | Homeowner, Interior Designer |
| Installing lighting fixtures | 3 | Electrician, Interior Designer |
| 10. Final Inspections and Cleaning | 1 |  |
| Performing deep cleaning | 1 | Cleaning Crew |
| 11. Moving In | 2 |  |
| Arranging for moving | 1 | Moving Company, Homeowner |
| Unpacking and set up each room | 1 | Homeowner, Helpers |
| **Total Estimated Time** | **47 Days** |  |

Define dependencies between items in WBS

**Planning and Design (1) -> Demolition and Site Preparation (2)**

**Demolition and Site Preparation (2) -> Construction of Walls and Structural Changes (3)**

**Structural Changes (3) ->Electrical and Plumbing Work (4)**

**Electrical Work (4) & Ventilation (5) ->Wall Finishing and Painting (6)**

**Wall Painting (6) ->Flooring Installation (7)**

**Flooring and Interior Installation (7) ->Kitchen and Bathroom Installation (8)**

**Kitchen and Bathroom Installation (8) ->Furnishing and Interior Decoration (7)**

**Furnishing and Interior Decoration (9) v Final Inspections and Cleaning (10)**

**Final Inspections and Cleaning (10) ->Moving In (11)**

Identify critical path

The **critical path** in a project management context is the longest sequence of dependent tasks that must be completed on time for the entire project to be completed on schedule. Any delays in the tasks on the critical path will directly affect the overall project timeline.

The **critical path** for your apartment renovation project is:

**1 → 2 → 3 → 4 → 6 → 7 → 8 → 9 → 10 → 11**

* **1 -** Planning and Design (10 days)
* 2 - Demolition and Site Preparation (2 days)
* 3 - Structural Changes (8 days)
* 4 - Electrical Work (4 days)
* 6 - Wall Finishing and Painting (4 days)
* 7 - Flooring Installation (5 days)
* 8 - Kitchen and Bathroom Installation (7 days)
* 9 - Furnishing and Interior Decoration (5 days)
* 10 - Final Inspections and Cleaning (1 days)
* 11 - Moving In (2 days)

**Total Duration for Critical Path:** 45 **days**

A graph with multiple colored lines

Description automatically generated with medium confidenceDraw a Gantt chart and say when you could start living in your new flat

To provide a more accurate estimation of when I can start living in my flat, I should consider both the average and worst-case scenarios and then select a midpoint between the two.

For example, I might anticipate an additional 10 days due to potential issues, such as delays in permit approvals for walls, electrical systems, or difficulties in finding an available designer. In the worst-case scenario, this would mean 47 days plus the extra 10 days, totaling 57 days.

Given that the expected completion time is 57 days, I can calculate the estimated time as follows:

**Expected Time + (Worst-Case Time – Expected Time) / 2**

This equals:

**47 days + (57 days - 47 days) / 2 = 53 days**

So, **53** days is a more accurate estimate of when I can expect to move into the flat. Of course, this estimation may need adjustment based on actual progress and any additional statistics or data.