

Network Diagram & Critical Path Analysis

MCP Agents Laravel UI Generator

Project: MCP Agents Laravel UI Generator

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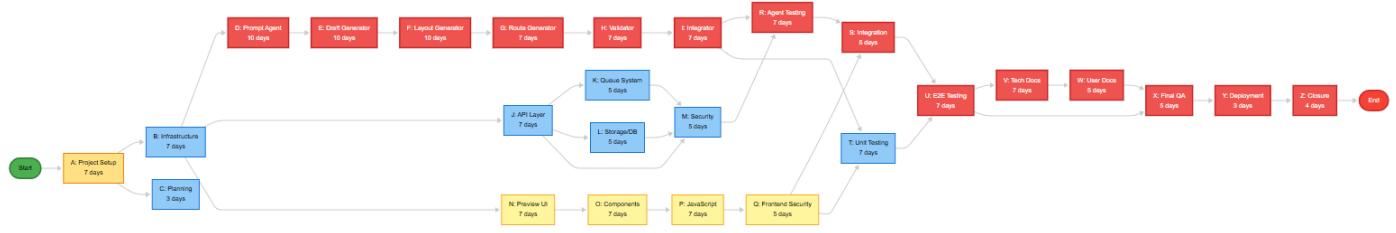
Activity List with Dependencies

| ID | Activity Name | Duration (days) | Predecessors | Resources |
|----|----------------------------------|-----------------|--------------|------------------|
| A | Project Setup & Charter | 7 | - | PM |
| B | Infrastructure Setup | 7 | A | Backend Engineer |
| C | Project Planning (WBS, Schedule) | 3 | A | PM |
| D | Prompt Processing Agent | 10 | B | Backend Engineer |
| E | Draft Generator Agent | 10 | D | Backend Engineer |
| F | Layout & Component Generator | 10 | E | Backend Engineer |
| G | Route Generator Agent | 7 | F | Backend Engineer |
| H | Validator Agent | 7 | G | Backend Engineer |

| | | | | |
|---|------------------------------|---|---------|-------------------|
| I | Project Integrator Agent | 7 | H | Backend Engineer |
| J | API Layer Development | 7 | B | Backend Engineer |
| K | Queue System Setup | 5 | J | Backend Engineer |
| L | Storage & Database Setup | 5 | J | Backend Engineer |
| M | Security Implementation | 5 | J, K, L | Backend Engineer |
| N | Preview UI Core | 7 | B | Frontend Engineer |
| O | Interactive Components | 7 | N | Frontend Engineer |
| P | JavaScript Functionality | 7 | O | Frontend Engineer |
| Q | Frontend Security | 5 | P | Frontend Engineer |
| R | Agent Integration Testing | 7 | I, M | Backend Engineer |
| S | Frontend-Backend Integration | 5 | Q, R | Both Engineers |
| T | Unit Testing | 7 | I, Q | Both Engineers |
| U | E2E Testing | 7 | S, T | Both Engineers |

| | | | | |
|---|-------------------------|---|------|----------------|
| V | Technical Documentation | 7 | U | Both Engineers |
| W | User Documentation | 5 | V | Both Engineers |
| X | Final Testing & QA | 5 | U, W | Both Engineers |
| Y | Deployment | 3 | X | Both Engineers |
| Z | Project Closure | 4 | Y | PM |

Network Diagram (AON - Activity on Node)



Legend:

- Green: Start/End milestones
- Red: Critical path activities
- Blue: Non-critical backend activities
- Yellow: Non-critical frontend activities

Legend:

- Green: Start/End milestones
- Pink: Critical path activities
- Yellow: Non-critical activities

Critical Path Analysis

Critical Path (Longest Path)

Path: Start → A → B → D → E → F → G → H → I → R → S → U → V → W → X → Y → Z → End

Critical Path Activities

1. **A:** Project Setup (7 days)
2. **B:** Infrastructure Setup (7 days)
3. **D:** Prompt Processing Agent (10 days)
4. **E:** Draft Generator Agent (10 days)
5. **F:** Layout & Component Generator (10 days)
6. **G:** Route Generator Agent (7 days)
7. **H:** Validator Agent (7 days)
8. **I:** Project Integrator Agent (7 days)
9. **R:** Agent Integration Testing (7 days)
10. **S:** Frontend-Backend Integration (5 days)
11. **U:** E2E Testing (7 days)
12. **V:** Technical Documentation (7 days)
13. **W:** User Documentation (5 days)
14. **X:** Final Testing & QA (5 days)
15. **Y:** Deployment (3 days)
16. **Z:** Project Closure (4 days)

Critical Path Duration

Total Duration: $7 + 7 + 10 + 10 + 10 + 7 + 7 + 7 + 7 + 5 + 7 + 7 + 7 + 5 + 5 + 3 + 4 = 109$ days (≈ 15.6 weeks)

Float/Slack Analysis

| Activity | ES | EF | LS | LF | Total Float | Free Float | Critical? |
|----------|----|----|----|----|-------------|------------|---|
| A | 0 | 7 | 0 | 7 | 0 | 0 | <input checked="" type="checkbox"/> Yes |

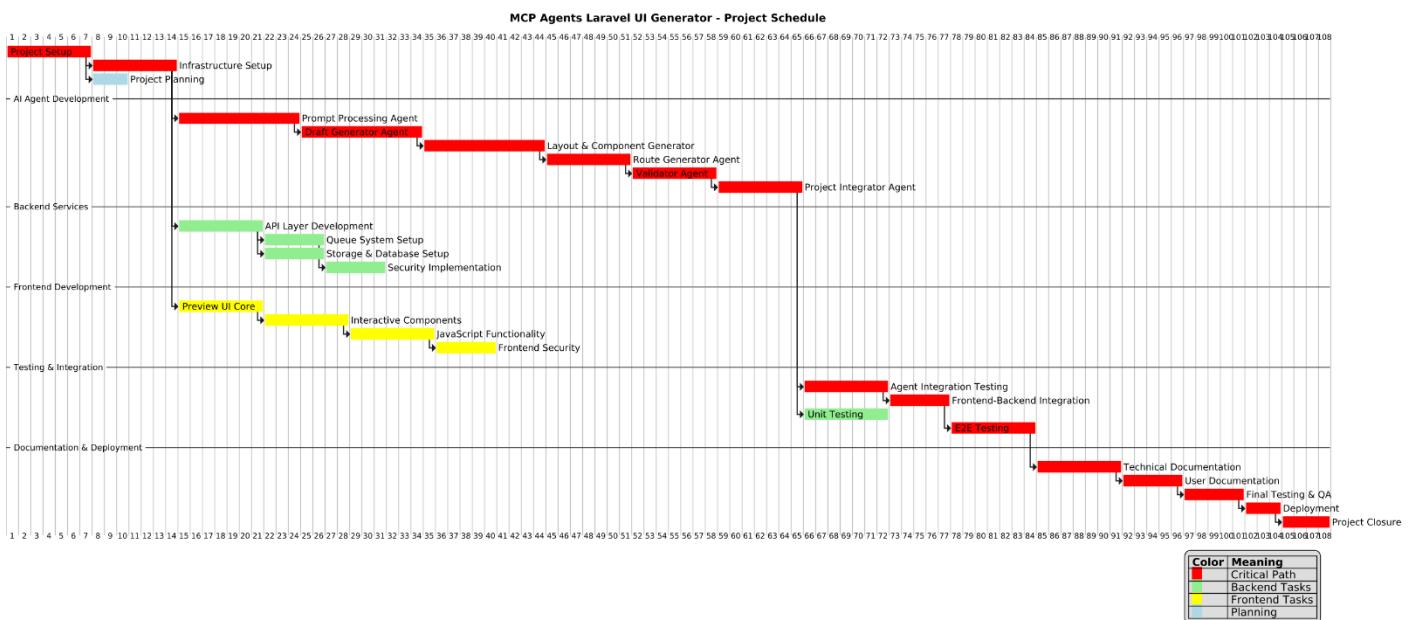
| | | | | | | | |
|---|-----|-----|-----|-----|---|---|---|
| B | 7 | 14 | 7 | 14 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| C | 7 | 10 | 11 | 14 | 4 | 4 | <input checked="" type="checkbox"/> No |
| D | 14 | 24 | 14 | 24 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| E | 24 | 34 | 24 | 34 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| F | 34 | 44 | 34 | 44 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| G | 44 | 51 | 44 | 51 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| H | 51 | 58 | 51 | 58 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| I | 58 | 65 | 58 | 65 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| J | 14 | 21 | 19 | 26 | 5 | 5 | <input checked="" type="checkbox"/> No |
| K | 21 | 26 | 26 | 31 | 5 | 5 | <input checked="" type="checkbox"/> No |
| L | 21 | 26 | 26 | 31 | 5 | 5 | <input checked="" type="checkbox"/> No |
| M | 26 | 31 | 31 | 36 | 5 | 5 | <input checked="" type="checkbox"/> No |
| N | 14 | 21 | 21 | 28 | 7 | 7 | <input checked="" type="checkbox"/> No |
| O | 21 | 28 | 28 | 35 | 7 | 7 | <input checked="" type="checkbox"/> No |
| P | 28 | 35 | 35 | 42 | 7 | 7 | <input checked="" type="checkbox"/> No |
| Q | 35 | 40 | 42 | 47 | 7 | 7 | <input checked="" type="checkbox"/> No |
| R | 65 | 72 | 65 | 72 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| S | 72 | 77 | 72 | 77 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| T | 65 | 72 | 70 | 77 | 5 | 5 | <input checked="" type="checkbox"/> No |
| U | 77 | 84 | 77 | 84 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| V | 84 | 91 | 84 | 91 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| W | 91 | 96 | 91 | 96 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| X | 96 | 101 | 96 | 101 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
| Y | 101 | 104 | 101 | 104 | 0 | 0 | <input checked="" type="checkbox"/> Yes |

| | | | | | | | |
|---|-----|-----|-----|-----|---|---|---|
| Z | 104 | 108 | 104 | 108 | 0 | 0 | <input checked="" type="checkbox"/> Yes |
|---|-----|-----|-----|-----|---|---|---|

Legend:

- ES: Early Start
- EF: Early Finish
- LS: Late Start
- LF: Late Finish
- Total Float: LS - ES (or LF - EF)
- Free Float: ES(successor) - EF(current)

Gantt Chart Representation



Risk Impact on Schedule

| Risk | Impact on Critical Path | Mitigation Strategy | Buffer Days |
|-----------------------------|-------------------------|---|-------------|
| AI Agent development delays | High - directly on CP | Parallel development where possible, daily standups | +7 days |

| | | | |
|-------------------------|--------------------------------|---|----------|
| Mistral API downtime | Medium - affects testing | Implement retry logic, use cached responses | +3 days |
| Integration issues | High - affects testing phase | Early integration testing, continuous integration | +5 days |
| Resource unavailability | High - single point of failure | Cross-training, documentation | +5 days |
| Scope creep | High - extends all phases | Strict change control, MVP focus | +10 days |

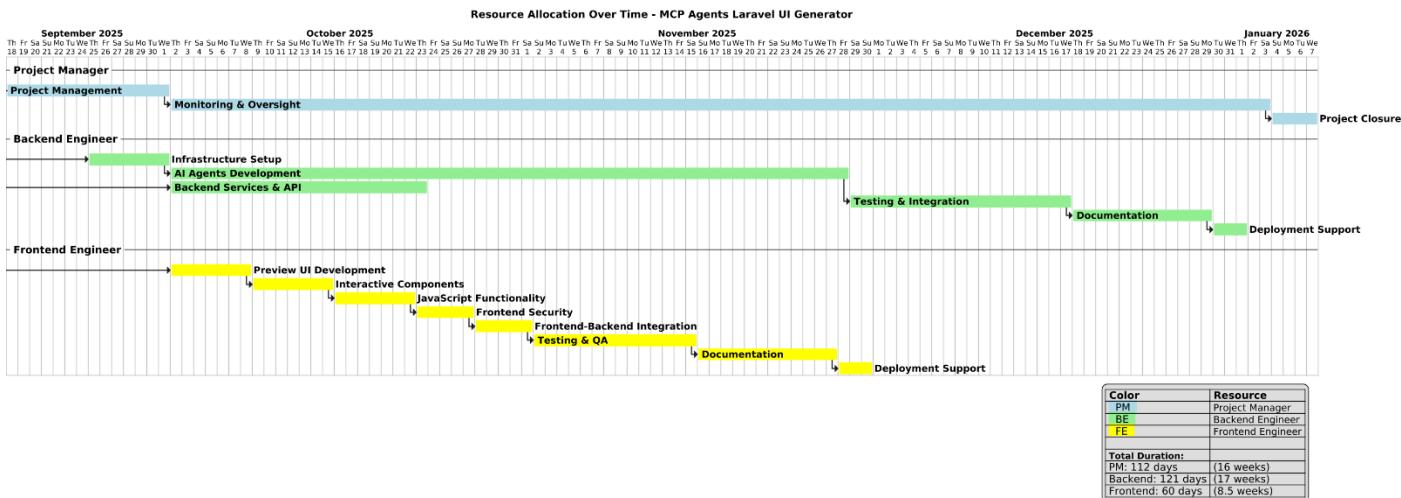
Recommended Project Buffer: 30 days (≈ 4 weeks)

Total Project Duration with Buffer: 139 days (≈ 20 weeks)

Milestone Schedule

| Milestone | Target Date | Dependencies | Deliverable |
|----------------------------|-------------|--------------|-------------------|
| M1: Project Kickoff | Day 0 | - | Project Charter |
| M2: Infrastructure Ready | Day 14 | A, B | Dev Environment |
| M3: Core Agents Complete | Day 58 | D, E, F | 3 AI Agents |
| M4: All Agents Complete | Day 65 | G, H, I | 6 AI Agents |
| M5: Backend Complete | Day 36 | J, K, L, M | API & Services |
| M6: Frontend Complete | Day 40 | N, O, P, Q | Preview UI |
| M7: Integration Complete | Day 77 | R, S | Integrated System |
| M8: Testing Complete | Day 84 | T, U | Test Reports |
| M9: Documentation Complete | Day 96 | V, W | All Docs |
| M10: Production Ready | Day 104 | X, Y | Deployed System |
| M11: Project Closure | Day 108 | Z | Final Report |

Resource Loading Chart



Optimization Recommendations

1. Fast-Tracking Opportunities

- **Frontend & Backend Development:** Can run in parallel (already planned)
- **Documentation:** Start technical documentation during development phase
- **Testing:** Begin unit testing as each agent is completed

2. Crashing Opportunities

- **Add resources to AI Agent development:** Hire additional backend engineer for agents D-I
 - Potential time savings: 20-30 days
 - Cost increase: 1 additional engineer salary
- **Parallel agent development:** Develop Route, Validator, and Integrator agents in parallel
 - Potential time savings: 14 days
 - Risk: Integration complexity increases

3. Schedule Compression

- **Current duration:** 109 days
- **With fast-tracking:** 95 days (-14 days)
- **With crashing:** 85 days (-24 days)
- **Aggressive compression:** 75 days (-34 days, high risk)

Conclusion

Critical Path Duration: 109 days (15.6 weeks)

Recommended Duration (with buffer): 139 days (20 weeks)

Critical Activities: 16 out of 26 activities (62%)

Schedule Risk: Medium-High (due to sequential agent development)

Key Recommendations:

1. Focus management attention on critical path activities
2. Monitor AI agent development closely (longest sequence)
3. Maintain 30-day buffer for unforeseen issues
4. Consider parallel agent development if resources allow
5. Start documentation early to reduce end-phase pressure