

# Activity Resource Estimates

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**Source File:** generated-documents\planning\activity-resource-estimates.md  
**Generated:** 16/07/2025 at 13:57:30  
**Generated by:** Requirements Gathering Agent - PDF Converter

## Activity Resource Estimates

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**Generated by** adpa-enterprise-framework-automation v3.2.0  
**Category:** planning  
**Generated:** 2025-07-14T21:23:19.766Z  
**Description:** PMBOK Activity Resource Estimates

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## Activity Resource Estimates

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**Project:** ADPA – Advanced Document Processing & Automation Framework  
**Version:** 3.2.0  
**Date:** July 2025

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### Document Overview

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This document provides comprehensive resource estimates for all major activities in the ADPA project. Estimates cover human resources, equipment/technology, materials, and facilities, structured by key project work packages: core framework development, AI integration, document generation, enterprise integration, compliance, testing, and phase-2 Adobe Creative Suite implementation.

**Methodology:**

- Role-based effort estimation
- Technology stack and integration dependency mapping
- Reference to standards compliance (BABOK, PMBOK, DMBOK)

- Historical data from prior phases and similar projects
  - Vendor and license requirements
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## Resource Categories

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### Human Resources

- **Roles and Skills:**
  - Project Manager (PM), Solution Architect, Lead Developer, Backend Developer, Frontend Developer, AI/ML Engineer, DevOps Engineer, QA/Test Engineer, Security Engineer, Technical Writer, Business Analyst, Integration Specialist, UI/UX Designer, Support Engineer
- **Skill Levels:**
  - Junior, Mid-Level, Senior/Lead
- **Availability:**
  - Full-time, part-time, contract/consulting

### Equipment and Technology

- **Hardware:**
  - Developer workstations, high-memory build servers, cloud VMs
- **Software:**
  - Node.js, TypeScript, Express.js, Next.js, Adobe Creative SDKs, VS Code, Azure/GCP SDKs, Microsoft Graph, OpenAI/Google AI APIs, testing tools (Jest), collaboration tools
- **Infrastructure:**
  - Azure/AWS/GCP cloud environments, Docker, CI/CD systems, enterprise VPN, network storage

### Materials and Supplies

- **Physical Materials:**
    - Office supplies (minimal, hybrid/remote model), security tokens
  - **Digital Assets:**
    - Document templates, code libraries, design assets, API specifications
  - **Consumables:**
    - API call credits (OpenAI, Google AI, Adobe), cloud compute credits, Adobe license quotas
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# Resource Estimates by Activity

Below, each major activity is detailed with resource estimates.

## 1. Framework Core Development

**Work Package:** WBS-1.1

**Duration:** 6 weeks

### Human Resource Requirements

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
Solution Architect	Senior	1	80%	6 wks	192 hrs
Lead Developer	Senior	1	100%	6 wks	240 hrs
Backend Developer	Mid/Senior	2	100%	6 wks	480 hrs
Frontend Developer	Mid	1	50%	6 wks	120 hrs
UI/UX Designer	Mid	1	25%	3 wks	30 hrs

### Equipment/Technology Requirements

- **Workstations:** 5 (development, high RAM/SSD)
- **Node.js/TypeScript Licenses:** Open source
- **VS Code Licenses:** 5 (free or enterprise)
- **Azure/GCP Dev Environments:** 2 VMs (development/test)
- **Collaboration Tools:** 5 user accounts (Teams, Slack, Jira)

### Material Requirements

- **Document Templates:** 10 (BABOK, PMBOK, DMBOK)
- **API Specifications:** 2 (OpenAPI/TypeSpec)

- **Design Assets:** ADPA branding package

**Estimation Basis**

- Complexity of modular Node.js/TypeScript architecture
- Need for robust CLI and REST API scaffolding

**Assumptions**

- Developers are familiar with Node.js/TypeScript stack
- All core team members are available at project start

**Constraints**

- Limited to 5 core devs for budget reasons
- Azure/GCP credits capped at \$2000/mo

**2. Multi-Provider AI Integration**

**Work Package:** WBS-1.2

**Duration:** 4 weeks

**Human Resource Requirements**

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
AI/ML Engineer	Senior	1	100%	4 wks	160 hrs
Backend Developer	Mid	1	75%	4 wks	120 hrs
Integration Specialist	Senior	1	50%	4 wks	80 hrs

**Equipment/Technology Requirements**

- **Cloud Accounts:** OpenAI, Google AI, Azure OpenAI, GitHub Copilot, Ollama (local VM)
- **API Credentials:** 5 (one per provider)
- **Workstations:** 2 (AI model experimentation)

- **Testing Environments:** 1 VM (GPU optional, for local AI)

**Material Requirements**

- **API Call Credits:** \$500 per provider
- **Test Data Sets:** 3 (document samples, requirements, business cases)

**Estimation Basis**

- Integration of 5 different AI providers
- API authentication, failover, and context management

**Assumptions**

- All provider APIs are accessible and documented
- Sufficient call credits for testing

**Constraints**

- Monthly API spend cap \$2500
- Local GPU access limited (for Ollama)

**3. Document Generation Engine & Templates**

**Work Package:** WBS-1.3

**Duration:** 5 weeks

**Human Resource Requirements**

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
Lead Developer	Senior	1	80%	5 wks	160 hrs
Backend Developer	Mid	1	100%	5 wks	200 hrs
Technical Writer	Mid	1	50%	5 wks	100 hrs

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
QA/Test Engineer	Mid	1	50%	5 wks	100 hrs

#### Equipment/Technology Requirements

- **Workstations:** 3
- **Adobe PDF Services SDK:** 1 license (for PDF output)
- **Puppeteer/Headless Browser:** 1 (for legacy pipeline)
- **API Access:** Document Generation API (Adobe)

#### Material Requirements

- **Document Templates:** 20+ (BABOK, PMBOK, DMBOK)
- **Sample Documents:** 30 (for QA)

#### Estimation Basis

- Coverage for three major standards (BABOK, PMBOK, DMBOK)
- Template engine complexity, output QA

#### Assumptions

- Reusable template structure
- Adobe API available for PDF generation

#### Constraints

- Adobe API quota (limit 1000 documents/mo)
- Limited QA resources

## 4. Enterprise Integration (Confluence, SharePoint, Adobe)

**Work Package:** WBS-1.4

**Duration:** 4 weeks

#### Human Resource Requirements

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
Integration Specialist	Senior	1	100%	4 wks	160 hrs
Backend Developer	Mid	1	75%	4 wks	120 hrs
DevOps Engineer	Mid	1	50%	4 wks	80 hrs
Security Engineer	Senior	1	25%	4 wks	40 hrs

### Equipment/Technology Requirements

- **SharePoint & Confluence Accounts:** 1 each (enterprise tenant)
- **Adobe Creative SDK Access:** 1 (see Phase-2 below)
- **Azure AD/OAuth2 Setup:** 1 (app registration)
- **Admin Portal:** Next.js, 2 user seats

### Material Requirements

- **API Credentials:** 3 integrations
- **Test Libraries/Sites:** 2 (for Confluence/SharePoint)

### Estimation Basis

- Experience with Microsoft Graph, Atlassian, and Adobe APIs
- Security and compliance overhead

### Assumptions

- Corporate accounts provisioned in advance
- Test sites available for integration

### Constraints

- Integration testing restricted to business hours
  - Lead time for admin consent (Azure AD/Atlassian)
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## 5. Compliance & Security Implementation

**Work Package:** WBS-1.5

**Duration:** 3 weeks

### Human Resource Requirements

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
Security Engineer	Senior	1	100%	3 wks	120 hrs
Project Manager	Senior	1	20%	3 wks	24 hrs
QA/Test Engineer	Mid	1	40%	3 wks	48 hrs

### Equipment/Technology Requirements

- **Security Tools:** 1 (dependency scanner, static analysis)
- **API Security Testing:** 1 (OWASP ZAP, etc.)
- **VPN Access:** 2 users

### Material Requirements

- **Regulatory Guidelines:** Digital copies (GDPR, SOX, etc.)
- **Checklists:** 10 (per compliance area)

### Estimation Basis

- Enterprise security hardening (OAuth2, JWT, CORS, rate limiting)
- Standards mapping (Basel III, PCI DSS, etc.)

### Assumptions

- Security baseline already established
- Project manager available for compliance reviews

### Constraints

- Compliance review scheduling



- Security tool licensing
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## 6. Testing & QA (Unit, Integration, Performance, UAT)

**Work Package:** WBS-1.6

**Duration:** 4 weeks (overlapping with activities)

### Human Resource Requirements

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
QA/Test Engineer	Mid	2	100%	4 wks	320 hrs
Backend Developer	Mid	1	40%	4 wks	64 hrs
Business Analyst	Senior	1	25%	4 wks	40 hrs

### Equipment/Technology Requirements

- **Test Environments:** 2 (staging, UAT)
- **Jest Licenses:** 2 (open source)
- **Performance Testing Tools:** 1 (Lighthouse, custom scripts)
- **Reporting Tools:** 2 (Allure, etc.)

### Material Requirements

- **Test Cases:** 50+
- **Sample Data Sets:** 10

### Estimation Basis

- Feature coverage, regression cycles
- Automated vs. manual test split

### Assumptions

- CI/CD pipeline in place
- Test data available

**Constraints**

- QA resource pool shared with other projects
  - Test environment outages
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**7. Phase-2: Adobe Creative Suite Presentation Layer**

**Work Package:** WBS-1.7

**Duration:** 6 weeks

**Human Resource Requirements**

Role	Skill Level	Quantity	% Allocation	Duration	Total Effort
Integration Specialist	Senior	1	100%	6 wks	240 hrs
Backend Developer	Senior	1	80%	6 wks	192 hrs
Frontend Developer	Mid	1	50%	6 wks	120 hrs
UI/UX Designer	Mid	1	50%	6 wks	120 hrs
Technical Writer	Mid	1	25%	6 wks	60 hrs

**Equipment/Technology Requirements**

- **Adobe Creative SDK Licenses:** 1 per API (InDesign, Illustrator, Photoshop, Document Gen)
- **Dedicated VM for InDesign Server:** 1 (cloud or on-prem, 8-core/32GB+)
- **API Credentials:** 4 (1 per Adobe API)
- **Workstations:** 3 (design/development)

**Material Requirements**

- **Brand Templates:** 5 (InDesign)

- **Sample Data/Images:** 20 (for Illustrator/Photoshop)
- **API Call Credits:** \$800 (Adobe Cloud)

**Estimation Basis**

- Experience with Adobe SDKs, template-based output
- High-end presentation and image processing needs

**Assumptions**

- SDK access granted before project start
- InDesign Server properly licensed and deployed

**Constraints**

- Adobe API quotas
- Design asset creation lead time

**Resource Summary**

**Human Resource Summary**

Role	Total Effort	Peak Utilization	Duration Needed	Skills Required
Solution Architect	192 hrs	80%	6 wks	Node.js, TypeScript, API design
Lead Developer	400 hrs	100%	11 wks	Node.js, TypeScript, Express.js, integration
Backend Developer	1156 hrs	100%	18 wks	Node.js, TypeScript, API, SDKs
Frontend Developer	240 hrs	50%	12 wks	Next.js, React, Tailwind

Role	Total Effort	Peak Utilization	Duration Needed	Skills Required
Integration Specialist	560 hrs	100%	10 wks	Microsoft Graph, Confluence, Adobe APIs
AI/ML Engineer	160 hrs	100%	4 wks	OpenAI, Google AI, Azure OpenAI, Copilot
QA/Test Engineer	688 hrs	100%	9 wks	Jest, API testing, performance
Security Engineer	160 hrs	100%	7 wks	OAuth2, JWT, enterprise security
Technical Writer	160 hrs	50%	11 wks	API docs, templates, user guides
UI/UX Designer	150 hrs	50%	9 wks	Figma, InDesign, Next.js
Project Manager	24 hrs	20%	3 wks	Agile/Scrum, stakeholder mgmt
Business Analyst	40 hrs	25%	4 wks	BABOK, requirements, acceptance criteria
DevOps Engineer	80 hrs	50%	4 wks	Azure, Docker, CI/CD
Support Engineer	0 (not yet)	-	-	-

## Equipment/Technology Summary

Item	Quantity	Duration	Cost Category	Procurement Lead Time
Developer Workstations	7	Project	CAPEX	2 weeks
Cloud Dev/Test VMs	4	Project	OPEX	1 week
Adobe Creative SDK Licenses	4	1 year	OPEX	2-4 weeks (approval)
OpenAI/Google/Azure Credits	n/a	Monthly	OPEX	1 week
InDesign Server VM	1	6 wks	OPEX	2 weeks
Next.js Admin Portal Seats	2	Project	OPEX	Immediate
MS Graph/SharePoint/Confluence Accounts	1 each	Project	OPEX	1 week
Security Tools	1	Project	OPEX	1 week
Collaboration (Jira, Slack)	7	Project	OPEX	Immediate

## Resource Optimization Opportunities

- **Shared Resources:**
    - Backend developers and QA/testers across modules
    - Cloud VMs and test environments reused across dev, test, and integration
  - **Resource Leveling:**
    - Overlap document generation and integration testing with core development
    - Stagger AI provider integration after core framework stabilization
  - **Alternative Resources:**
    - Use open-source tools where feasible (e.g., replace paid tools with community editions)
    - Substitute local GPU/VMs for cloud AI services if API quotas exceeded
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## Assumptions & Constraints (Project-wide)

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- Most team members are hybrid (on-site/remote)
  - All required licenses and cloud credits are budgeted
  - Adobe and enterprise API credentials are provisioned promptly
  - Integration environments (SharePoint, Confluence) are accessible
  - Security and compliance sign-offs are not delayed
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### End of Resource Estimates

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