Deep Research Agent - Setup Checklist

✅ Pre-Development Checklist

Complete this checklist before starting development to ensure smooth setup.

🔧 System Requirements

- [ ] **Node.js 18+** installed (`node --version`)
- [ ] **npm or yarn** installed (`npm --version`)
- [ ] **PostgreSQL 14+** installed and running (`psql --version`)
- [ ] **Redis 6+** installed and running (`redis-cli --version`)
- [ ] **Git** installed for version control

🔑 API Keys Required

Essential (Must Have)

- [ ] **OpenAI API Key** - Required for AI processing
- Visit: https://platform.openai.com/
- Create account and generate API key
- Add to `.env` : `OPENAI_API_KEY=sk-your-key-here`
- Budget: ~$20-50/month for development

Recommended (Free)

- [ ] **USPTO API Key** - US patent data
- Visit: https://developer.uspto.gov/
- Register and create application
- Add to `.env` : `USPTO_API_KEY=your-key-here`
- Free with rate limits

Optional (Enhanced Features)

- [ ] **SendGrid API Key** - Email notifications
- Visit: https://sendgrid.com/
- Free tier: 100 emails/day
- Add to `.env` : `SENDGRID_API_KEY=your-key-here`

💾 Database Setup

PostgreSQL Configuration

- [ ] PostgreSQL service is running
  ```bash
  sudo systemctl status postgresql
  ```
- [ ] Database and user created
  ```sql
  CREATE DATABASE deep_research_agent;
  CREATE USER research_user WITH PASSWORD 'research_password';
  GRANT ALL PRIVILEGES ON DATABASE deep_research_agent TO research_user;
  ```

- [ ] Database connection tested
  ```bash
  psql -U research_user -d deep_research_agent -c "SELECT 1;"
  ```

Redis Configuration

- [ ] Redis service is running
  ```bash
  sudo systemctl status redis-server
  ```
- [ ] Redis connection tested
  ```bash
  redis-cli ping  # Should return PONG
  ```

⚙️ Environment Configuration

Environment File Setup

- [ ] `.env` file exists in project root
- [ ] Database URL configured correctly
- [ ] Redis URL configured correctly
- [ ] JWT secret is secure (not default)
- [ ] OpenAI API key added
- [ ] Other API keys added as obtained

Security Settings

- [ ] JWT secret is unique and secure
  ```bash
  # Generate secure secret
  node -e "console.log(require('crypto').randomBytes(32).toString('hex'))"
  ```
- [ ] Database password is not default
- [ ] `.env` file is in `.gitignore`

🚀 Development Environment

Project Structure

- [ ] Project folder extracted/downloaded
- [ ] All documentation files present:
- [ ] `PROJECT_SUMMARY.md`
- [ ] `DEVELOPMENT_PLAN.md`
- [ ] `API_CONFIGURATION.md`
- [ ] `QUICK_START.md`
- [ ] `README.md`

Dependencies Ready

- [ ] Package manager working
- [ ] Development tools available
- [ ] Code editor/IDE configured

🔍 Testing Setup

API Connectivity Tests

- [ ] Google Patents API accessible
  ```bash
  ```

```
  curl "https://patents.googleapis.com/v1/patents:search" \
    -X POST -H "Content-Type: application/json" \
    -d '{"q": "test"}'
```

- [ ] USPTO API accessible (if configured)
- [ ] OpenAI API accessible

```bash
  curl https://api.openai.com/v1/models \
    -H "Authorization: Bearer $OPENAI_API_KEY"
```

📊 Development Priorities

Week 1-2: Foundation

- [ ] NextJS project initialization
- [ ] Database schema creation
- [ ] User authentication system
- [ ] Basic UI layout

Week 3-4: Patent Search

- [ ] Google Patents API integration
- [ ] USPTO API integration
- [ ] Search interface development
- [ ] Results display components

Week 5-6: Processing System

- [ ] Background job queue setup
- [ ] Batch processing implementation
- [ ] Progress tracking system
- [ ] WebSocket integration

🎯 Ready to Start Development?

Final Verification

Before proceeding, ensure:
- [ ] All systems are running (PostgreSQL, Redis)
- [ ] Essential API keys are configured
- [ ] Database connection is successful
- [ ] Environment variables are set correctly

Quick Start Command

Once everything is configured:

```
# Navigate to project
cd deep_research_agent_project

# Install dependencies (when project is initialized)
npm install

# Start development server
npm run dev
```

Initial Development Steps

1. **Review Documentation** - Read PROJECT_SUMMARY.md thoroughly
2. **Follow Development Plan** - Use DEVELOPMENT_PLAN.md as guide
3. **Start with Phase 1** - Foundation setup first
4. **Test Each Component** - Validate as you build
5. **Monitor API Usage** - Track costs and rate limits

Success Indicators

You're ready when:
- ✅ All services respond correctly
- ✅ API keys work without errors
- ✅ Database queries execute successfully
- ✅ Development environment is stable

🆘 Need Help?

Common Issues

- **Database Connection Failed**: Check PostgreSQL service and credentials
- **Redis Not Responding**: Verify Redis service is running
- **API Authentication Failed**: Verify API keys are correct and active
- **Rate Limits Exceeded**: Monitor API usage and implement delays

Resources

- **OpenAI Documentation**: https://platform.openai.com/docs
- **USPTO API Docs**: https://developer.uspto.gov/api-catalog
- **PostgreSQL Guide**: https://www.postgresql.org/docs/
- **Redis Documentation**: https://redis.io/documentation

Development Support

- Review the detailed API_CONFIGURATION.md for specific setup instructions
- Use QUICK_START.md for rapid development setup
- Follow DEVELOPMENT_PLAN.md for structured implementation

Once this checklist is complete, you're ready to build the Deep Research Agent! 🚀