








1 PROJECT OVERVIEW

You are required to build a **Windows desktop application** similar in capability to **Adobe Acrobat Pro (excluding AI & OCR features)**.

Key Principles:

-  NO AI FEATURES
-  NO OCR (now or future)
-  Offline-first
-  Distributed as .exe
-  Subscription-based licensing
-  Strong document security & redaction
-  Professional, clean, user-friendly UI

Target users:
Chartered Accountants, CS, Lawyers, Corporates, SMEs, Compliance Professionals

2 CORE OBJECTIVES

1. Provide **professional PDF creation, editing, redaction, security, and signing**
 2. Ensure **data privacy (no cloud processing)**
 3. Follow **ISO PDF standards & Indian legal compliance**
 4. Make UI **simple enough for non-technical professionals**
 5. Prevent casual piracy using **license validation**
 6. Keep architecture **extensible for future modules**
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3 TECHNOLOGY STACK (MANDATORY)

| Layer | Stack |
|-------------------|--------------------------|
| Language | Python 3.11+ |
| UI Framework | PyQt6 or PySide6 |
| PDF Engine | PyMuPDF (fitz) + pikepdf |
| Encryption | AES-256 |
| Digital Signature | PKCS#12 / Windows CAPI |

| Layer | Stack |
|---------------|------------------------------------|
| Local Storage | SQLite |
| Packaging | PyInstaller |
| Updates | Optional auto-update |
| Licensing | Hardware-bound + server validation |

- ✗ No Electron
 - ✗ No browser-based UI
 - ✗ No cloud dependency for document processing
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4 FEATURE SCOPE (STRICT – DO NOT ADD AI / OCR)

4.1 PDF Creation & Conversion

- Create PDF from:
 - Word
 - Excel
 - PowerPoint
 - Images (JPG, PNG)
 - Virtual “Print to PDF” capability
 - Batch conversion
 - PDF/A conversion for archival
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4.2 PDF Editing

- Edit existing text (font-preserving)
 - Edit / replace images
 - Add text boxes
 - Insert / delete / reorder pages
 - Rotate / crop pages
 - Merge multiple PDFs
 - Split PDFs by:
 - Page range
 - File size
 - Bookmark
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4.3 Redaction (CRITICAL MODULE)

Redaction must be **irreversible**.

Required:

- Manual redaction (draw box)
- Text-based redaction
- Pattern-based redaction:
 - PAN
 - Aadhaar
 - GSTIN
 - Bank account numbers
- Metadata removal
- Flattened output (cannot be undone)

 Redacted data must **not exist** in underlying PDF objects.

4.4 Security & Protection

- Password protection (open / edit / print)
 - Permission controls
 - AES-256 encryption
 - Watermarking:
 - Text
 - Image
 - Permanent flattening
 - PDF permissions viewer
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4.5 Digital Signature

- Support Indian DSC (Class 2 / 3)
 - USB token support
 - Visual signature placement
 - Timestamp support
 - Signature validation panel
 - Signature audit trail
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4.6 Forms & Utilities

- Create fillable PDF forms
- Flatten forms
- Export form data to Excel
- Page numbering
- Bates numbering

- Header / footer
 - Background & stamps
 - Hyperlinks
 - Bookmarks
 - PDF compression & optimization
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5 UI / UX DESIGN GUIDELINES (VERY IMPORTANT)

5.1 Visual Style

- Professional
- Clean
- Minimal
- Corporate-friendly

Color Scheme:

- Primary: Blue / Slate / Grey
 - Accent: Green
 - Avoid flashy colors
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5.2 Layout Structure

Top Ribbon (like MS Office):

- File
- Edit
- Pages
- Security
- Redaction
- Forms
- Signature
- Tools
- Help

Left Panel:

- Thumbnails
- Bookmarks
- Layers
- Attachments

Main Canvas:

- PDF preview

- Zoom tools
- Page navigation

Right Context Panel:

- Properties
 - Formatting
 - Security options
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5.3 UX Principles

- Max 2 clicks for common actions
 - Clear icons + text
 - Undo / Redo support
 - Tooltips everywhere
 - Keyboard shortcuts
 - Progress indicators for long tasks
 - Confirmation dialogs for destructive actions
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6 LICENSING & SUBSCRIPTION LOGIC

6.1 License Model

- Annual subscription
 - Machine-bound (Hardware ID)
 - Online activation
 - Offline grace period (7 days)
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6.2 License Flow

1. App installed
 2. User enters license key
 3. App validates with server
 4. License stored locally (encrypted)
 5. Periodic silent re-validation
 6. On expiry:
 - App opens in read-only mode
 - Prompt for renewal
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6.3 Anti-Tamper

- Obfuscate license logic

- Check system clock tampering
 - Prevent simple DLL patching
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7 LEGAL & REGULATORY COMPLIANCE (MANDATORY)

7.1 PDF Standards

- ISO 32000 (PDF specification)
 - Proper object removal for redaction
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7.2 Indian Legal Compliance

- Information Technology Act, 2000
 - DPDP Act, 2023 (privacy-first)
 - Digital Signature rules (IT Act)
 - No user data sent outside device
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7.3 EULA & Disclaimers

- Clear license terms
 - No liability for misuse
 - Redaction disclaimer
 - Signature legal disclaimer
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8 DATA HANDLING RULES

- All files processed locally
 - No telemetry without consent
 - No hidden uploads
 - Logs stored locally
 - Clear cache option
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9 PERFORMANCE REQUIREMENTS

- Handle 500+ page PDFs
 - Memory efficient
 - Non-blocking UI
 - Background workers for heavy tasks
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10 ARCHITECTURE GUIDELINES

- Modular design

- Feature-wise services
 - Easy future extension
 - Clear separation:
 - UI
 - PDF Engine
 - Security
 - Licensing
 - Utilities
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1 1 PACKAGING & DELIVERY

- Single .exe
 - Installer with:
 - Desktop shortcut
 - Start menu entry
 - Auto-update ready (optional)
 - Log file for support
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1 2 PHASE-WISE DELIVERY PLAN

Phase 1 (MVP)

- Core editing
- Merge/split
- Security
- Redaction
- Licensing

Phase 2

- Forms
- Signatures
- Bates numbering
- Watermarks

Phase 3

- Optimization
 - Auto-update
 - UI polish
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1 3 STRICT INSTRUCTIONS TO DEVELOPER

- ❌ Do NOT add AI or OCR
 - ❌ Do NOT add cloud dependency
 - ❌ Do NOT change licensing logic
 - ❌ Do NOT simplify redaction logic
 - ✅ Follow UI/UX instructions strictly
 - ✅ Write clean, documented code
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END GOAL

Deliver a **stable, professional, offline PDF suite** that:

- Professionals trust
 - Is legally safe
 - Is affordable
 - Competes with Adobe on **practicality, not hype**
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