

Product Requirements Document: Universal Video Downloader Platform

1. Executive Summary

1.1 Product Overview

A web-based universal video downloader platform that enables users to download videos from major social media and video platforms (YouTube, Instagram, TikTok, Facebook, Twitter, etc.) without limitations, registration requirements, or technical barriers.

1.2 Product Vision

To become the most reliable, fastest, and user-friendly video downloading solution that respects user privacy while providing unlimited access to content across all major platforms.

1.3 Success Metrics

- 100,000+ monthly active users within 6 months
- Average download success rate > 95%
- Page load time < 2 seconds
- Average download initiation time < 5 seconds
- User satisfaction score > 4.5/5

2. Problem Statement

2.1 Current Market Pain Points

- Existing downloaders have daily limits or require registration
- Many services add watermarks to downloaded content
- Inconsistent quality across different platforms
- Privacy concerns with data collection
- Complex interfaces that confuse non-technical users
- Frequent downtime and broken functionality
- Intrusive ads and malware risks

2.2 Target Audience

- **Primary:** Content creators (18-35 years) who need to repurpose or backup their content
- **Secondary:** Casual users (16-50 years) who want to save videos for offline viewing
- **Tertiary:** Marketing professionals and educators who need video content for presentations

3. Product Goals & Objectives

3.1 Primary Goals

1. Provide unlimited, free video downloads across 50+ platforms
2. Deliver downloads in the highest available quality (up to 8K)
3. Ensure 99.5% uptime and reliability
4. Maintain complete user privacy (no data collection or registration)
5. Support all major video formats and audio extraction

3.2 Business Objectives

- Achieve 500,000 monthly active users in Year 1
- Generate revenue through non-intrusive advertising
- Establish partnerships with content creation tools
- Build a premium tier for advanced features

4. Functional Requirements

4.1 Core Features

4.1.1 Multi-Platform Support

Priority: P0 (Must Have)

Supported platforms include:

- YouTube (videos, shorts, playlists)
- Instagram (posts, reels, stories, IGTV)
- TikTok (videos without watermarks)
- Facebook (public videos, reels)
- Twitter/X (videos, GIFs)
- Vimeo
- Reddit
- Pinterest
- LinkedIn
- Twitch (clips and VODs)

- Dailymotion
- Snapchat (public stories)
- And 40+ additional platforms

Acceptance Criteria:

- System successfully identifies and downloads videos from all listed platforms
- Platform detection is automatic based on URL pattern
- Fallback mechanisms exist for platform API changes

4.1.2 Simple Download Interface**Priority: P0 (Must Have)****User Flow:**

1. User pastes video URL into input field
2. System analyzes URL and fetches available formats
3. User selects desired quality/format
4. Download begins immediately

Acceptance Criteria:

- Single input field prominently displayed on homepage
- Real-time URL validation with visual feedback
- Download options displayed within 3 seconds
- One-click download initiation

4.1.3 Quality & Format Options**Priority: P0 (Must Have)****Available Options:**

- Video qualities: 8K, 4K, 2K, 1080p, 720p, 480p, 360p (based on source availability)
- Formats: MP4, WEBM, MKV
- Audio extraction: MP3, M4A, WAV (various bitrates: 320kbps, 256kbps, 192kbps, 128kbps)
- Subtitle download (when available)

Acceptance Criteria:

- All available qualities from source are presented
- Format conversion happens server-side
- Quality selection remembers user preference
- Clear indication of file size for each option

4.1.4 Watermark Removal

Priority: P0 (Must Have)

- Remove TikTok watermarks automatically
- Remove Instagram branding when possible
- Preserve original video quality during processing

Acceptance Criteria:

- TikTok videos download without watermark by default
- Option to include/exclude watermarks where applicable
- No quality degradation during watermark removal

4.1.5 Batch Downloading

Priority: P1 (Should Have)

- Support playlist downloads (YouTube, Spotify)
- Download multiple videos simultaneously
- Queue management system
- Progress tracking for each item

Acceptance Criteria:

- Users can paste multiple URLs or playlist URL
- Maximum 50 videos per batch
- Individual progress bars for each download
- Ability to pause/resume/cancel individual items

4.1.6 Browser Extension

Priority: P1 (Should Have)

- Chrome, Firefox, Safari, Edge extensions

- One-click download button on supported platforms
- Integrates seamlessly with video player interfaces

Acceptance Criteria:

- Extension appears on all supported video platforms
- Download initiated without leaving current page
- Extension syncs with web app preferences

4.2 Technical Features

4.2.1 Backend Architecture

Priority: P0 (Must Have)

Components:

- URL parser and platform detector
- Video metadata extractor
- Streaming download service
- Format conversion service (FFmpeg-based)
- Caching layer for frequently accessed videos
- Load balancer for traffic distribution

Technology Stack:

- Backend: Node.js/Python (FastAPI)
- Video processing: FFmpeg, yt-dlp
- Database: PostgreSQL (metadata), Redis (caching)
- Storage: AWS S3/CloudFront or similar CDN
- Queue system: RabbitMQ/Redis Queue

4.2.2 Frontend Architecture

Priority: P0 (Must Have)

Technology Stack:

- Framework: React.js or Next.js
- Styling: Tailwind CSS
- State management: Redux or Context API

- API calls: Axios with retry logic

Key Features:

- Responsive design (mobile-first approach)
- Progressive Web App (PWA) capabilities
- Offline functionality for previously cached videos
- Dark/light mode support

4.2.3 API Design

Priority: P0 (Must Have)

Endpoints:

POST /api/analyze

- Input: video_url
- Output: video_metadata, available_formats, thumbnail

POST /api/download

- Input: video_url, format, quality
- Output: download_link (temporary, expires in 1 hour)

GET /api/download/:token

- Streams video file to user

POST /api/batch

- Input: array of video_urls
- Output: batch_id, status_endpoint

GET /api/batch/:batch_id

- Output: batch status, individual video statuses

4.2.4 Security & Privacy

Priority: P0 (Must Have)

Measures:

- No user data collection or storage
- No registration or login required
- HTTPS encryption for all communications
- Rate limiting per IP (100 requests/hour)
- CAPTCHA for suspicious activity

- Input sanitization to prevent injection attacks
- Content Security Policy headers
- Regular security audits

4.2.5 Performance Optimization

Priority: P0 (Must Have)

Strategies:

- CDN for static assets and temporary video hosting
- Video metadata caching (24-hour TTL)
- Lazy loading for UI components
- Code splitting and minification
- Image optimization and WebP support
- Gzip/Brotli compression
- Database query optimization with indexing

4.3 User Experience Features

4.3.1 Smart URL Detection

Priority: P1 (Should Have)

- Auto-detect URLs from clipboard
- Support for shortened URLs (bit.ly, etc.)
- Handle mobile vs desktop URLs automatically
- Recognize various URL formats from same platform

4.3.2 Download History

Priority: P2 (Nice to Have)

- Local browser storage of download history
- Quick re-download from history
- Search functionality within history
- Export history as CSV

Note: Stored locally only, never on server

4.3.3 Video Preview

Priority: P2 (Nice to Have)

- Thumbnail preview before download
- Video duration and basic metadata display
- Creator information (name, channel)

4.3.4 Mobile Experience

Priority: P0 (Must Have)

- Fully responsive design
- Touch-optimized interface
- Share sheet integration (iOS/Android)
- Reduced data mode option
- Native app feel through PWA

4.4 Monetization Features

4.4.1 Free Tier

- Unlimited downloads
- All platforms supported
- Standard ad placements (non-intrusive)
- Maximum 1080p quality
- Single video downloads

4.4.2 Premium Tier (\$4.99/month or \$39.99/year)

Priority: P1 (Should Have)

Features:

- Ad-free experience
- 4K/8K downloads
- Batch downloading (up to 100 videos)
- Priority download queue
- Faster download speeds
- API access (100 calls/day)

- Browser extension with premium features
- Email support

4.4.3 Advertisement Strategy

Priority: P0 (Must Have)

- Maximum 2 ad units per page
- No pop-ups or pop-unders
- No auto-play video ads
- No malware or misleading ads
- Google AdSense or similar reputable networks
- Native advertising for relevant products

5. Non-Functional Requirements

5.1 Performance

- Page load time: < 2 seconds
- Video analysis time: < 5 seconds
- Download initiation: < 3 seconds after selection
- Support 10,000 concurrent users
- Handle 1 million downloads per day

5.2 Scalability

- Horizontally scalable architecture
- Auto-scaling based on traffic
- Global CDN distribution
- Database sharding capability
- Microservices architecture for independent scaling

5.3 Reliability

- 99.5% uptime SLA
- Automatic failover systems
- Regular backups
- Disaster recovery plan

- Platform API monitoring with automatic fallbacks

5.4 Compatibility

- Browser support: Chrome 90+, Firefox 88+, Safari 14+, Edge 90+
- Mobile browsers: iOS Safari 14+, Chrome Mobile
- Operating systems: Windows 7+, macOS 10.13+, Linux, iOS 13+, Android 8+
- Screen sizes: 320px to 4K displays

5.5 Accessibility

- WCAG 2.1 Level AA compliance
- Keyboard navigation support
- Screen reader optimization
- High contrast mode
- Text size adjustment
- Alt text for all images

5.6 Legal & Compliance

- GDPR compliance (EU users)
- CCPA compliance (California users)
- Terms of Service clearly stating intended use
- Copyright disclaimer and fair use notice
- DMCA takedown process
- Age verification for restricted content

6. User Interface Requirements

6.1 Homepage Layout

Components:

1. Header

- Logo
- Navigation menu (How it Works, Supported Sites, FAQ, Premium)
- Language selector

- Dark/light mode toggle

2. Hero Section

- Main headline: "Download Videos from Any Platform - Free & Unlimited"
- URL input field (large, centered)
- "Download" button
- Supported platform logos
- Trust indicators (downloads count, user testimonials)

3. Features Section

- 4-6 key features with icons
- Brief descriptions

4. How It Works Section

- 3-step visual guide
- Screenshots or illustrations

5. Supported Platforms Section

- Grid of platform logos
- "50+ platforms supported" indicator

6. FAQ Section

- Collapsible questions
- 8-10 most common questions

7. Footer

- Links (About, Privacy, Terms, Contact, Blog)
- Social media icons
- Copyright notice

6.2 Download Results Page

Components:

1. Input field (pre-filled with URL)
2. Video preview thumbnail
3. Video metadata (title, duration, creator)
4. Quality/format selection buttons
5. File size indicators
6. Download button (primary CTA)

7. "Download Another Video" link

6.3 Mobile Interface Adaptations

- Hamburger menu for navigation
- Full-width input field
- Stacked layout for quality options
- Bottom sheet for format selection
- Floating download button

7. Technical Constraints & Considerations

7.1 Platform API Limitations

- YouTube: May require API key, rate limits apply
- Instagram: Private profiles not accessible
- TikTok: Frequent URL structure changes
- Facebook: Login-required videos inaccessible

Mitigation:

- Multiple extraction methods per platform
- Fallback to web scraping when APIs unavailable
- Regular monitoring and quick updates
- Community-driven platform support

7.2 Legal Considerations

- Respect robots.txt directives
- Honor DMCA takedown requests
- Clear terms prohibiting illegal use
- No storage of copyrighted content
- Temporary file deletion after 1 hour

7.3 Infrastructure Costs

- Video processing server costs
- CDN bandwidth costs

- Storage costs for temporary files
- Database hosting

Cost Optimization:

- Aggressive caching strategies
- Temporary file auto-deletion
- CDN with cost-effective pricing
- Reserved instance discounts

8. Development Phases

Phase 1: MVP (Months 1-3)

Deliverables:

- Core platform support (YouTube, Instagram, TikTok, Facebook, Twitter)
- Basic web interface
- Single video downloads
- MP4 format support
- Up to 1080p quality
- Basic analytics

Success Criteria:

- 5 platforms fully functional
- 90% download success rate
- 10,000 monthly users

Phase 2: Enhancement (Months 4-6)

Deliverables:

- 20+ additional platforms
- Audio extraction
- Multiple format support
- Browser extensions (Chrome, Firefox)
- Batch downloading
- Premium tier launch

- Dark mode

Success Criteria:

- 95% download success rate
- 100,000 monthly users
- 1% premium conversion rate

Phase 3: Scale & Optimize (Months 7-12)

Deliverables:

- 50+ total platforms
- Mobile apps (iOS, Android)
- API access for developers
- Advanced analytics dashboard
- Partnership integrations
- Multi-language support (10+ languages)
- CDN optimization

Success Criteria:

- 500,000 monthly users
- 99% uptime
- 3% premium conversion rate
- Break-even or profitable

9. Success Metrics & KPIs

9.1 User Metrics

- Monthly Active Users (MAU)
- Daily Active Users (DAU)
- User retention rate (7-day, 30-day)
- Average downloads per user
- Session duration

9.2 Technical Metrics

- Download success rate by platform
- Average download time
- Server response time
- Error rate
- Uptime percentage
- CDN hit rate

9.3 Business Metrics

- Premium conversion rate
- Monthly Recurring Revenue (MRR)
- Customer Acquisition Cost (CAC)
- Lifetime Value (LTV)
- Ad revenue per user
- Churn rate

9.4 Engagement Metrics

- Bounce rate
- Pages per session
- Click-through rate on quality options
- Share rate
- Browser extension installations

10. Risk Assessment & Mitigation

10.1 Technical Risks

Risk: Platform API changes break functionality

- **Likelihood:** High
- **Impact:** High
- **Mitigation:** Multiple extraction methods, automated monitoring, rapid response team

Risk: Server overload during viral traffic spikes

- **Likelihood:** Medium
- **Impact:** High

- **Mitigation:** Auto-scaling, CDN, queue system, rate limiting

Risk: Video processing quality issues

- **Likelihood:** Medium
- **Impact:** Medium
- **Mitigation:** Extensive testing, user feedback loop, fallback quality options

10.2 Legal Risks

Risk: Copyright infringement claims

- **Likelihood:** Medium
- **Impact:** High
- **Mitigation:** Clear ToS, DMCA compliance, no content storage, fair use education

Risk: Platform terms of service violations

- **Likelihood:** High
- **Impact:** Medium
- **Mitigation:** Legal review, industry best practices, multiple access methods

10.3 Business Risks

Risk: Insufficient revenue to cover costs

- **Likelihood:** Medium
- **Impact:** High
- **Mitigation:** Multiple revenue streams, cost optimization, premium tier, partnerships

Risk: Competition from established players

- **Likelihood:** High
- **Impact:** Medium
- **Mitigation:** Superior UX, unlimited access, reliability, community building

11. Maintenance & Support

11.1 Ongoing Maintenance

- Daily platform compatibility checks

- Weekly security updates
- Monthly feature updates
- Quarterly infrastructure reviews
- Continuous monitoring and alerting

11.2 Customer Support

- FAQ and knowledge base
- Email support (response within 24 hours)
- Community forum
- Twitter/social media support
- Premium users: Priority support

11.3 Platform Updates

- Automated testing for platform changes
- CI/CD pipeline for rapid deployments
- Rollback capabilities
- Staged rollouts for major changes

12. Future Enhancements (Post-Launch)

12.1 Potential Features

- Cloud storage integration (Google Drive, Dropbox)
- Video editing capabilities (trim, crop, filters)
- Subtitle generation and translation
- Video compression tools
- Format conversion library
- Social sharing features
- Collaborative playlists
- Video summarization using AI
- Automatic organization and tagging

12.2 Platform Expansion

- Niche platform support (educational, sports, gaming)

- Live stream recording
- Podcast downloading
- Music platform support (Spotify, Apple Music)
- Conference platform support (Zoom, Teams recordings)

13. Conclusion

This PRD outlines a comprehensive video downloader platform that addresses current market limitations while providing unlimited, high-quality downloads across 50+ platforms. The phased approach ensures steady growth while maintaining quality and reliability. Success depends on technical excellence, legal compliance, and superior user experience that prioritizes simplicity and privacy.

Next Steps:

1. Stakeholder review and approval
2. Technical architecture deep dive
3. Design mockups and user testing
4. Development sprint planning
5. MVP development kickoff