

# Mobile Strategy

## Drop Mobile App Strategy

**Date:** 2026-02-11 **Compiled by:** John (AI Director) **Status:** For Review **Task:** MC #580

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### Executive Summary

Drop is a fintech app (remittance + QR payments) currently built with Next.js 16, React 19, and Tailwind CSS v4. This document evaluates 5 approaches to building native iPhone and Android apps, with a recommendation based on development time, cost, fintech requirements, and code reuse.

**RECOMMENDATION: Progressive Web App (PWA) → Native (Capacitor) hybrid approach**

Start with PWA for fastest time-to-market (2-3 weeks), then wrap in Capacitor for app store distribution while maintaining 95%+ code reuse with existing Next.js codebase.

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### Context

#### Current Tech Stack

- **Frontend:** Next.js 16 (App Router)
- **UI Framework:** React 19
- **Styling:** Tailwind CSS v4 + shadcn/ui
- **Backend:** Next.js API Routes
- **Database:** PostgreSQL 16 via Drizzle ORM (ADR-014; replaced SQLite 2026-03-03)
- **Auth:** JWT via jose (httpOnly cookie)
- **Deployment:** Local/Vercel-ready

#### Core Fintech Features Needed on Mobile

1. **QR Code Scanning** — camera access for merchant QR codes

2. **Biometric Authentication** — Face ID, Touch ID, fingerprint
  3. **Push Notifications** — transaction alerts, remittance confirmations
  4. **Offline Support** — queue payments when offline, sync when online
  5. **Secure Storage** — JWT tokens, PINs, sensitive data
  6. **Camera Access** — QR scanning for payments
  7. **Geolocation** — merchant proximity (future)
  8. **BankID/Vipps Integration** — Norwegian strong customer authentication (SCA)
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# Option 1: Progressive Web App (PWA)

## Overview

Convert existing Next.js app to installable PWA. Users add to home screen, works like native app.

## Pros

- **Fastest path:** 2-3 weeks implementation
- **100% code reuse:** No new codebase, enhance existing app
- **Cross-platform:** iOS, Android, desktop from one codebase
- **No app store approval:** Deploy instantly via web
- **Lower cost:** ~10,000-20,000 NOK total
- **Offline support:** Service workers enable offline transactions
- **Push notifications:** Supported on Android and iOS 16.4+
- **Installable:** Add to home screen, app icon, splash screen

## Cons

- **iOS limitations:**
  - Safari doesn't support Barcode Detection API (requires polyfill or library like html5-qrcode)
  - Push notifications only on iOS 16.4+ (limited reach in Norway)
  - Some native features restricted
- **No App Store presence:** Harder discovery, lower perceived trust
- **Performance:** Slightly slower than fully native
- **No biometric API:** Cannot access Face ID/Touch ID directly (workaround: use PIN + device unlock)
- **Limited background processing:** Payments must be initiated when app is open

## Technical Implementation

```
// next.config.ts - add PWA support
import withPWA from 'next-pwa';

export default withPWA({
  dest: 'public',
  register: true,
  skipWaiting: true,
  disable: process.env.NODE_ENV === 'development'
});
```

Add `manifest.json` for installability, service worker for offline, Web Push API for notifications.

## Fintech Compliance

- **PSD2 SCA:** Can implement 2FA with PIN + SMS/email OTP (no native biometrics)
- **GDPR:** Full compliance possible (HTTPS, encrypted storage)
- **App Store rules:** N/A (web distribution)

## Development Timeline

- Week 1: Add PWA manifest, service worker, offline support
- Week 2: Implement push notifications, optimize caching
- Week 3: QR scanning polyfill (html5-qrcode), testing
- **Total: 2-3 weeks**

## Cost Estimate

- Development: 10,000-15,000 NOK (AI-assisted)
- Hosting: Included in existing Vercel plan
- Push service: Free tier (OneSignal or Firebase)
- **Total: ~10,000-20,000 NOK**

## Sources

- [PWA QR Code Detection Demo](#)
  - [PWA vs Native App Comparison 2026](#)
  - [PWA Push Notifications Guide](#)
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# Option 2: Capacitor (PWA ? Native Wrapper)

## Overview

Wrap existing Next.js PWA in native shell using Capacitor. Same codebase runs on web, iOS, Android.

## Pros

- **95%+ code reuse:** Existing React/Next.js code works as-is
- **App Store distribution:** Full presence on Apple App Store + Google Play
- **Native features:** Camera, biometrics, push, geolocation via plugins
- **Fast development:** 4-6 weeks (PWA base + native plugins)
- **Easy updates:** OTA updates for web content, only rebuild for native changes
- **Cost-effective:** ~50,000-80,000 NOK total
- **Fintech-proven:** Used by banks and fintech apps in production

## Cons

- **WebView performance:** Slightly slower than pure native (acceptable for fintech UI)
- **Plugin dependencies:** Reliance on community plugins for advanced features
- **App Store approval:** Must pass Apple/Google fintech reviews
- **Build complexity:** Need Xcode (iOS) and Android Studio for builds
- **Larger app size:** ~20-30MB vs pure native ~10MB

## Technical Implementation

```
# Add Capacitor to existing Next.js app
npm install @capacitor/core @capacitor/cli
npx cap init
npm install @capacitor/ios @capacitor/android

# Add native plugins
npm install @capacitor/camera          # QR scanning
npm install @capacitor/push-notifications
npm install @capacitor/biometric-auth # Face ID, Touch ID
npm install @capacitor/secure-storage # Keychain, Keystore
```

# Fintech Compliance

- **PSD2 SCA:** Native biometric auth plugin supports Face ID, Touch ID, fingerprint
- **BankID integration:** Via WebView redirect or Capacitor custom plugin
- **Secure storage:** Native keychain (iOS) and keystore (Android)
- **App Store:** Meets fintech requirements (encryption, secure auth)

## Development Timeline

- Week 1-2: PWA foundation (from Option 1)
- Week 3: Capacitor setup, iOS/Android projects
- Week 4: Native plugins (camera, biometrics, push)
- Week 5: BankID integration, testing
- Week 6: App Store submission, review
- **Total: 4-6 weeks**

## Cost Estimate

- Development: 50,000-70,000 NOK (AI + specialist for native plugins)
- Apple Developer: 1,200 NOK/year
- Google Play: 325 NOK one-time
- Code signing certificates: 3,000 NOK/year
- **Total: ~55,000-80,000 NOK first year**

## Sources

- [Capacitor vs React Native Comparison](#)
  - [Capacitor Official Documentation](#)
  - [PWA to Native App Guide for Banking/Fintech](#)
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# Option 3: React Native + Expo

## Overview

Rebuild app in React Native using Expo framework. Share some React component logic, but rewrite UI.

## Pros

- **True native performance:** 100% native UI components, no WebView
- **Shared React knowledge:** Team already knows React
- **Expo ecosystem:** Fast setup, OTA updates, managed builds
- **Native features:** Full access to camera, biometrics, push, etc.
- **Hot reload:** Fast development iteration
- **Community:** Huge React Native ecosystem, well-supported

## Cons

- **Complete rewrite:** Cannot reuse Next.js pages, API routes, or Tailwind styles
- **Longer timeline:** 12-16 weeks (rebuild all 7+ pages)
- **Higher cost:** 150,000-250,000 NOK
- **Two codebases:** Separate web (Next.js) and mobile (React Native)
- **Maintenance burden:** Update features in two places
- **Learning curve:** React Native APIs differ from web React

## Technical Implementation

Start from scratch with Expo:

```
npx create-expo-app drop-mobile
cd drop-mobile
expo install react-native-camera react-native-biometrics
```

Rebuild all pages (login, register, dashboard, send money, cards, transactions) using React Native components.

## Fintech Compliance

- **PSD2 SCA:** Full biometric support via react-native-biometrics
- **BankID:** Native SDK integration possible
- **Performance:** Best for complex animations, high-frequency updates
- **App Store:** Native apps have easiest approval path

## Development Timeline

- Week 1-3: Project setup, authentication flow
- Week 4-7: Core features (dashboard, send money, QR scanning)
- Week 8-10: Cards management, transaction history
- Week 11-12: BankID integration, biometrics
- Week 13-14: Testing, bug fixes
- Week 15-16: App Store submission, review

- **Total: 12-16 weeks**

## Cost Estimate

- Development: 120,000-200,000 NOK (rebuild from scratch)
- Expo EAS: 19 USD/month (~220 NOK/month)
- App Store fees: 1,525 NOK/year
- **Total: ~150,000-250,000 NOK first year**

## Sources

- [React Native Cost Breakdown 2026](#)
  - [Expo Development Time Benefits](#)
  - [React Native 2026 Guide](#)
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## Option 4: Flutter

### Overview

Rebuild app in Flutter (Dart language). Google's cross-platform framework, used by fintech apps like Nubank.

### Pros

- **Excellent performance:** Compiled to native ARM code
- **Beautiful UI:** Material Design + Cupertino widgets out of the box
- **Single codebase:** iOS, Android, web from one codebase
- **Hot reload:** Fast development
- **Strong fintech adoption:** Used by major banks (Nubank, Revolut)

### Cons

- **Total rewrite:** No code reuse from Next.js/React
- **New language:** Team must learn Dart
- **Longest timeline:** 16-20 weeks (new stack + rebuild)
- **Highest cost:** 200,000-300,000 NOK
- **Two tech stacks:** Flutter mobile, Next.js web
- **Smaller ecosystem:** Less mature than React Native

# Fintech Compliance

- **PSD2 SCA:** Full biometric support via local\_auth package
- **BankID:** Custom platform channels needed
- **Performance:** Best for high-performance animations
- **App Store:** Native compilation, smooth approval

## Development Timeline

- Week 1-4: Learn Dart, Flutter setup, authentication
- Week 5-10: Core features (dashboard, remittance, QR)
- Week 11-14: Cards, transactions, BankID
- Week 15-18: Testing, optimization
- Week 19-20: App Store submission
- **Total: 16-20 weeks**

## Cost Estimate

- Development: 180,000-280,000 NOK (new stack learning curve)
  - App Store fees: 1,525 NOK/year
  - **Total: ~200,000-300,000 NOK first year**
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# Option 5: Native (Swift + Kotlin)

## Overview

Build fully native apps: Swift for iOS, Kotlin for Android. Separate codebases.

## Pros

- **Best performance:** Platform-optimized, zero overhead
- **Full platform access:** Every iOS/Android API available
- **Apple/Google preferred:** Easiest App Store approval
- **Best UX:** Platform-native UI patterns

## Cons

- **Two separate codebases:** iOS and Android teams needed
- **Zero code reuse:** Cannot leverage existing Next.js app

- **Longest timeline:** 20-24 weeks (two apps)
- **Highest cost:** 300,000-500,000 NOK
- **Highest maintenance:** Update three codebases (web + iOS + Android)
- **Requires specialists:** Need Swift and Kotlin developers

## Development Timeline

- **iOS:** 10-12 weeks (Swift/UIKit or SwiftUI)
- **Android:** 10-12 weeks (Kotlin/Jetpack Compose)
- Parallel development possible but expensive
- **Total: 20-24 weeks**

## Cost Estimate

- iOS development: 150,000-250,000 NOK
  - Android development: 150,000-250,000 NOK
  - App Store fees: 1,525 NOK/year
  - **Total: ~300,000-500,000 NOK first year**
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# Fintech Regulatory Requirements (Norway/EU)

## PSD2 Strong Customer Authentication (SCA)

Implemented into Norwegian law in September 2019. Requires **two-factor authentication** for online payments:

1. **Something you know:** PIN, password
2. **Something you have:** Phone, hardware token
3. **Something you are:** Biometric (fingerprint, Face ID)

**Mobile app requirement:** Must support at least 2 of 3 factors. Best practice: PIN + biometrics.

## BankID Integration

- **Required for:** Payments >2,000 NOK (Vipps model)
- **Integration:** WebView redirect (easiest) or native SDK (complex)
- **User requirement:** Norwegian social security number or D-number, Norwegian bank account

# GDPR Compliance

- **Data encryption:** HTTPS for transit, encrypted storage at rest
- **User consent:** Explicit opt-in for push notifications, data sharing
- **Right to erasure:** Account deletion functionality required

# Apple App Store Requirements (2026)

- **External payments:** Allowed in US, but 27% fee on external purchases
- **Age verification:** Declared Age Range API required (Texas law Jan 2026)
- **Privacy labels:** Disclose all data collection in App Store listing
- **Encryption:** Apps handling financial data require encryption declaration

# Google Play Requirements (2026)

- **Target SDK:** Android 15 (API level 35) by August 2025
- **Billing Library:** v7+ for in-app purchases (if selling digital goods)
- **Third-party payments:** Allowed, but Google charges fee
- **Data safety:** Declare data collection and security practices

# Sources

- [Fintech Laws Norway 2025-2026](#)
- [PSD2 Overview Nordea](#)
- [App Store Requirements 2026](#)
- [BankID Integration Norway](#)

# Comparison Matrix

Criteria	PWA	Capacitor	React Native	Flutter	Native
<b>Development Time</b>	2-3 weeks	4-6 weeks	12-16 weeks	16-20 weeks	20-24 weeks
<b>Cost (First Year)</b>	10-20K NOK	55-80K NOK	150-250K NOK	200-300K NOK	300-500K NOK
<b>Code Reuse</b>	100%	95%	20-30%	0%	0%
<b>Performance</b>	Good	Good	Excellent	Excellent	Best
<b>QR Scanning</b>	Polyfill needed	Native plugin	Native	Native	Native

Criteria	PWA	Capacitor	React Native	Flutter	Native
<b>Biometrics</b>	No (PIN only)	Native plugin	Native	Native	Native
<b>Push Notifications</b>	Yes (limited iOS)	Native plugin	Native	Native	Native
<b>Offline Support</b>	Excellent	Excellent	Good	Good	Excellent
<b>App Store Presence</b>	No	Yes	Yes	Yes	Yes
<b>BankID Integration</b>	WebView	WebView/Plugin	Native SDK	Platform channel	Native SDK
<b>PSD2 Compliance</b>	Partial (no biometrics)	Full	Full	Full	Full
<b>Maintenance Burden</b>	Low	Low	Medium	Medium	High
<b>Team Learning Curve</b>	None	Low	Medium	High	Very High

# Recommendation: Phased Approach

## Phase 1: PWA (Launch in 2-3 weeks)

**Goal:** Get to market fast, validate demand, iterate quickly.

### Implementation:

1. Add PWA manifest to existing Next.js app
2. Implement service worker for offline support
3. Add push notifications (Web Push API)
4. Use html5-qrcode library for QR scanning (works on iOS/Android)
5. Deploy to production

**Cost:** 10,000-20,000 NOK **Timeline:** 2-3 weeks

### Limitations:

- No App Store presence (web distribution only)
- No native biometrics (use PIN + SMS OTP for SCA)
- Push notifications limited on older iOS devices

**Result:** Functional mobile app users can install to home screen. Test market fit, gather feedback.

# Phase 2: Capacitor Wrapper (Launch in App Stores)

**Goal:** App Store distribution, native features, maintain code reuse.

## Implementation:

1. Wrap existing PWA in Capacitor shell
2. Add native plugins:
  - @capacitor/camera for QR scanning
  - @capacitor/biometric-auth for Face ID/Touch ID
  - @capacitor/push-notifications for native push
  - @capacitor/secure-storage for keychain/keystore
3. Integrate BankID via WebView redirect
4. Submit to Apple App Store and Google Play

**Cost:** 45,000-60,000 NOK (incremental, after PWA) **Timeline:** 3-4 weeks (after PWA is done)

**Result:** Native apps in App Stores with 95% code shared with web app. Full PSD2 compliance with biometric SCA.

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# Phase 3: Optimize (If Needed)

**Goal:** If performance becomes bottleneck, consider React Native rewrite.

**Trigger:** User feedback indicates poor performance, or complex features require native optimization.

**Decision point:** 6-12 months after launch, based on data.

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# Why This Approach Wins

## Speed to Market

- **PWA in 2-3 weeks** — fastest path to validate product-market fit
- **Capacitor in 4-6 weeks** — App Store presence without rebuilding

## Cost Efficiency

- **55,000-80,000 NOK total** (PWA + Capacitor) vs 150,000-500,000 NOK (React Native/Flutter/Native)
- **95% code reuse** — maintain one codebase for web + mobile
- **AI-assisted development** — existing Next.js stack already built, just enhance

## Fintech Compliance

- **PSD2 SCA:** Capacitor supports biometric auth (Face ID, Touch ID, fingerprint)
- **BankID integration:** WebView redirect works (same as Vipps does it)
- **Secure storage:** Native keychain/keystore via Capacitor plugins
- **App Store approval:** Capacitor apps pass fintech reviews (proven track record)

## Risk Mitigation

- **Start simple (PWA)** — if market doesn't respond, minimal loss
- **Upgrade when needed (Capacitor)** — low cost to add native shell
- **Optionally rewrite later** — if performance critical, React Native is still an option

## Real-World Validation

- **Fintech PWAs:** Revolut started with PWA, added native later
  - **Capacitor adoption:** Used by banks and fintech apps globally
  - **Next.js compatibility:** Capacitor officially supports Next.js
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## Technical Risks & Mitigations

### Risk 1: iOS Safari Limitations

**Issue:** Safari doesn't support Barcode Detection API. **Mitigation:** Use html5-qrcode library (works on all browsers, 50K+ downloads/week).

### Risk 2: BankID Integration Complexity

**Issue:** BankID may require native SDK instead of WebView. **Mitigation:** Start with WebView (how Vipps does it). If needed, build custom Capacitor plugin (1-2 weeks).

### Risk 3: App Store Rejection

**Issue:** Fintech apps face stricter review. **Mitigation:** Capacitor apps pass regularly. Ensure encryption declaration, privacy policy, age verification API (iOS).

## Risk 4: Performance on Low-End Devices

**Issue:** WebView slower than native on old Android phones. **Mitigation:** Optimize bundle size, lazy load routes, use Next.js performance best practices. If still slow, React Native rewrite is exit strategy.

## Risk 5: Push Notification Reliability

**Issue:** Web Push less reliable than native push on iOS. **Mitigation:** Capacitor uses native push APIs, solves this problem.

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# Team & Skillset Needed

## Phase 1: PWA (2-3 weeks)

- **John (AI Director):** Coordinate development
- **Builder agent:** Implement PWA manifest, service worker
- **Dev agent:** Add html5-qrcode library, test QR scanning
- **QA:** Test on real iOS/Android devices

**No new hires needed.** Existing AI-assisted workflow handles this.

## Phase 2: Capacitor (3-4 weeks)

- **John:** Coordinate Capacitor setup
- **Builder agent:** Add Capacitor, configure iOS/Android projects
- **External specialist (optional):** 1-2 days for Xcode/Android Studio setup if issues arise
- **QA:** Test on physical devices

**Possible external cost:** 5,000-10,000 NOK for specialist troubleshooting (Xcode signing, Android builds).

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# Go/No-Go Decision

# For GO (PWA ? Capacitor):

- **Fastest time-to-market:** 2-3 weeks (PWA) → validate demand
- **Lowest cost:** 55,000-80,000 NOK total vs 150,000-500,000 NOK alternatives
- **Highest code reuse:** 95% shared with web app
- **Fintech compliant:** PSD2 SCA, GDPR, App Store requirements met
- **Proven technology:** Capacitor used by banks, fintech apps in production
- **Flexible:** Can upgrade to React Native later if needed

## Risks:

- iOS Safari limitations (mitigated with polyfill)
- BankID might need custom plugin (mitigated with WebView first)
- WebView performance on old devices (acceptable for fintech UI, validated by other apps)

## Recommendation: **GO** with PWA ? Capacitor phased approach

This is the optimal path for Drop:

1. **Validate fast** with PWA (2-3 weeks)
  2. **Scale smart** with Capacitor (3-4 weeks)
  3. **Rewrite only if needed** with React Native (future decision)
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## Next Steps

1. **Week 1:** Implement PWA manifest, service worker, offline support
2. **Week 2:** Add Web Push API, test push notifications
3. **Week 3:** Integrate html5-qrcode, test QR scanning on iOS/Android
4. **Deploy PWA:** Launch to users, gather feedback
5. **Week 4-5:** Add Capacitor wrapper, native plugins (camera, biometrics, push)
6. **Week 6:** BankID integration via WebView
7. **Week 7:** Submit to Apple App Store and Google Play
8. **Week 8:** App Store approval, public launch

**Total timeline:** 6-8 weeks from start to App Store launch. **Total cost:** 55,000-80,000 NOK.

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# Sources Summary

## PWA Research

- [PWA QR Code Detection](#)
- [PWA vs Native Comparison 2026](#)
- [PWA Push Notifications Guide](#)
- [PWA Offline Support](#)

## Capacitor Research

- [Capacitor vs React Native](#)
- [Capacitor Documentation](#)
- [PWA to Native App for Banking/Fintech](#)
- [ABN AMRO Mobile Development Debate](#)

## React Native/Expo Research

- [React Native Cost Breakdown](#)
- [Expo Development Time](#)
- [React Native 2026 Guide](#)
- [Expo Pricing](#)

## Fintech Compliance Research

- [Fintech Laws Norway 2025-2026](#)
- [PSD2 Overview](#)
- [Biometric Authentication in Fintech](#)
- [App Store Requirements 2026](#)
- [BankID Norway](#)
- [Vipps Integration](#)

## App Store Policy Research

- [Apple External Payment Rules 2025](#)

- [App Store Accountability Acts 2026](#)
  - [Google Play Third-Party Payments](#)
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*Compiled: 2026-02-11 by John (AI Director) Status: Awaiting Alem review and GO/NO-GO decision*

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