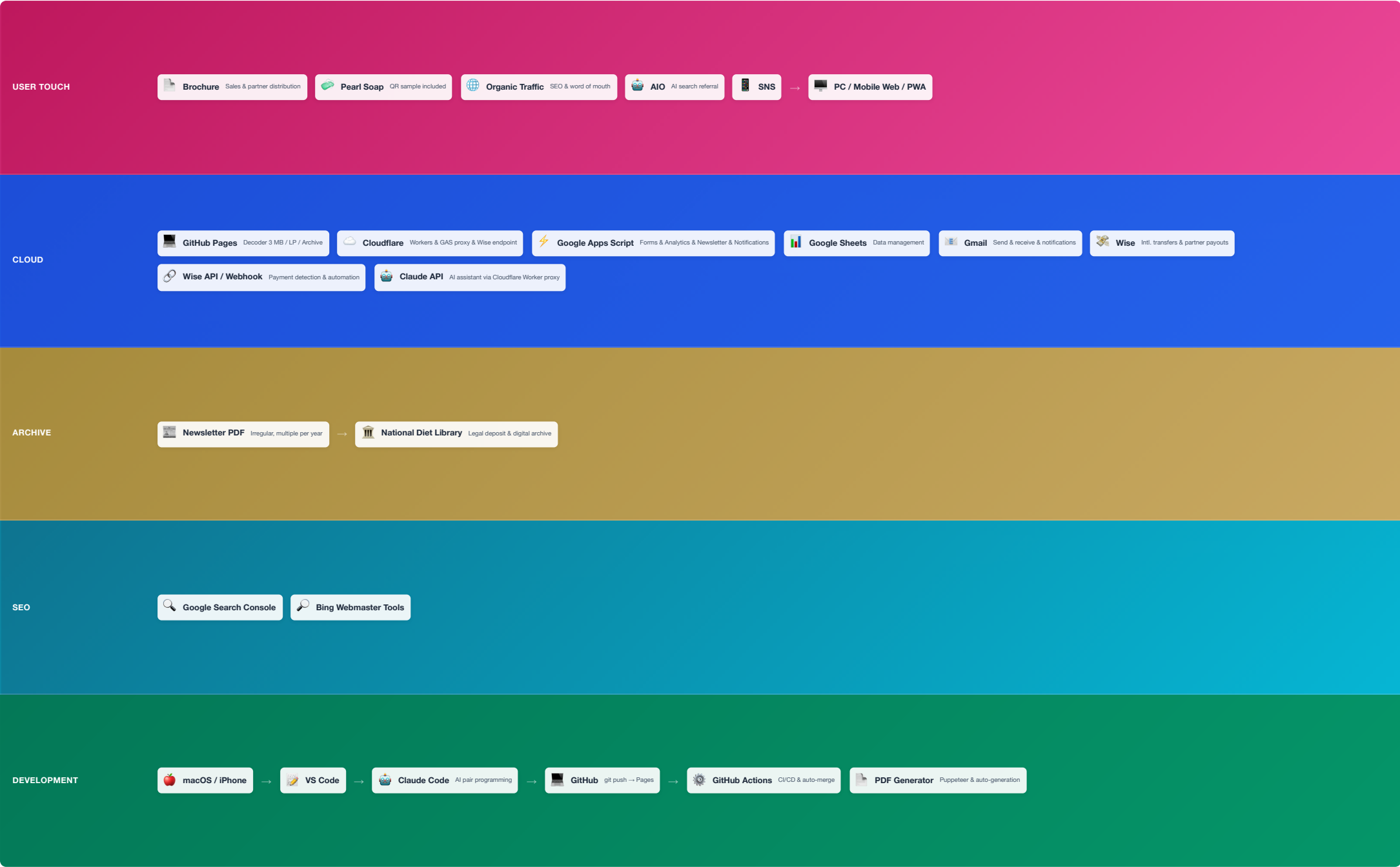# TokiStorage
Technical Architecture

No server. No subscription.

Three-layer distributed storage carrying voice and memory **a thousand years** forward.

Zero proprietary servers — hosting, payments, and development all composed from external services

USER TOUCH

| Brochure — Sales & partner distribution | Pearl Soap — QR sample included | Organic Traffic — SEO & word of mouth | AIO — AI search referral | SNS | → | PC / Mobile Web / PWA |

CLOUD

| GitHub Pages — Decoder 3 MB / LP / Archive | Cloudflare — Workers & GAS proxy & Wise endpoint | Google Apps Script — Forms & Analytics & Newsletter & Notifications | Google Sheets — Data management | Gmail — Send & receive & notifications | Wise — Intl. transfers & partner payouts |

| Wise API / Webhook — Payment detection & automation | Claude API — AI assistant via Cloudflare Worker proxy |

ARCHIVE

| Newsletter PDF — Irregular, multiple per year | → | National Diet Library — Legal deposit & digital archive |

SEO

| Google Search Console | Bing Webmaster Tools |

DEVELOPMENT

| macOS / iPhone | → | VS Code | → | Claude Code — AI pair programming | → | GitHub — git push → Pages | → | GitHub Actions — CI/CD & auto-merge | PDF Generator — Puppeteer & auto-generation |

Zero fixed monthly costs. Zero proprietary servers — development, delivery, payments, and archiving all run on external services and public institutions. Frontend, GAS, and Cloudflare Workers run on JavaScript / HTML / CSS; generator scripts in Python.

# Zero servers in the data flow — an architecture with no dependencies

ARCHITECTURE & DATA FLOW

Input	Encoder	URL Generation	QR Code	Scan	Decoder
Voice / Image / Text	In-browser encoding	Base64URL embed	V40 / 2,953B	Smartphone / 3x zoom	GitHub Pages / PWA / 3MB

NO SERVER IN DATA FLOW — No server, no database, no API, no account
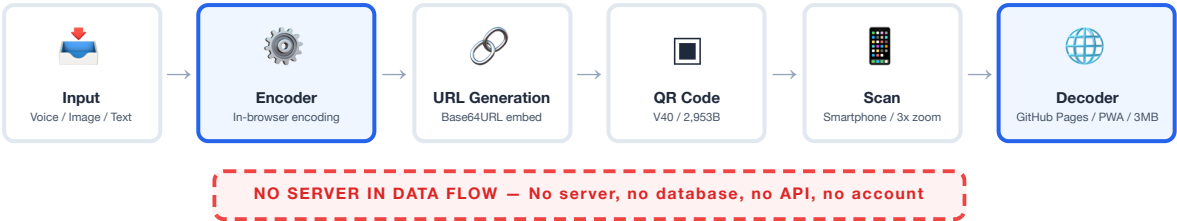
Data Type	Encoding	Max Capacity
Voice	Codec2 WASM (6 modes: 3200–450 bps)	~29 sec (450 bps)
Image	JPEG / WebP — in-browser resize + Base64URL	~2.2 KB
Text	UTF-8 — Base64URL	~2,900 chars

To eliminate service shutdown risk, servers are completely removed from the data flow. The QR code itself is the storage, and the decoder is just a 3 MB static site. With PWA, fully offline playback is possible. No customer data, personal information, or confidential data is held.

BULK MODE ARCHITECTURE

Supports long audio, high-res images, and long text beyond the single QR's 30-second limit

| Source Data | → | Codec
Opus / Image / Text | → | N-Split |

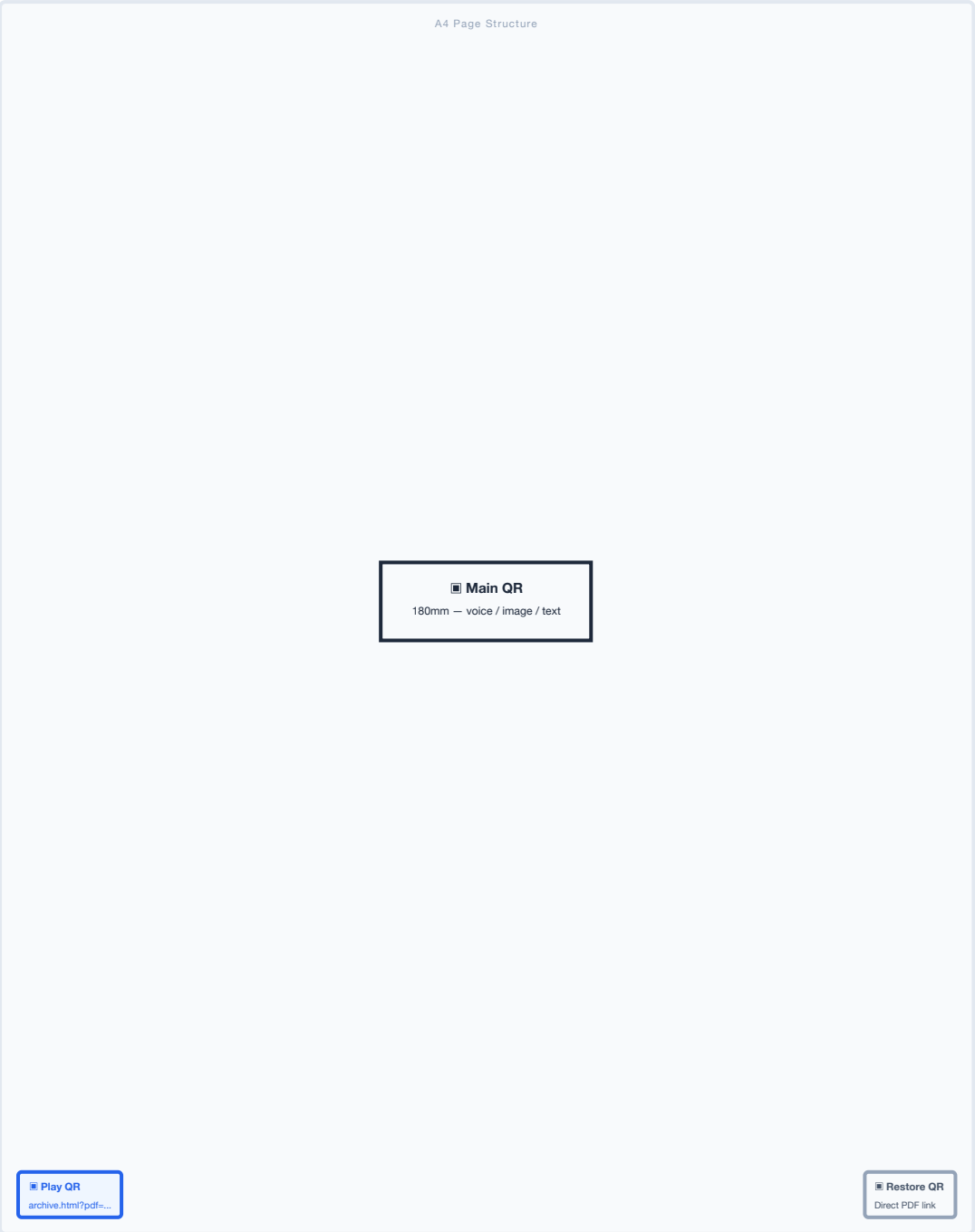| QR 1 | QR 2 | ... | QR n | → | Self-Print |
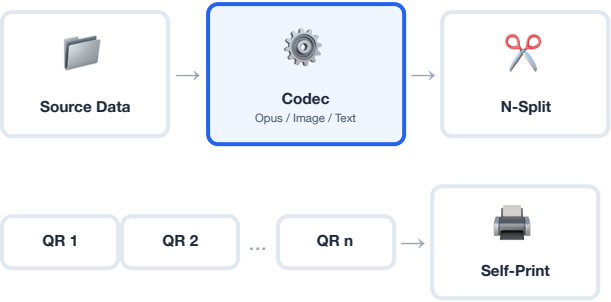
The server cannot see balances, revoke credits, or recover lost ones. This asymmetry is intentional by design.

💳 Prepaid Credits

- ¥150 / 1 code ($1)
- IndexedDB (browser storage)
- No account required
- No personal info required
- No expiry
- Purchase via Wise transfer

MULTI-LAYER RESTORATION ARCHITECTURE

A4 Page Structure

◼ **Main QR**
180mm — voice / image / text

◼ **Play QR**
archive.html?pdf=...

◼ **Restore QR**
Direct PDF link

Path	Entry Point	Action
A. Play QR	Page bottom-left (blue)	Scan → auto-decode → instant play
B. Restore QR	Page bottom-right (grey)	Scan → fetch PDF → save
C. PDF Link	Inside PDF viewer	Click → browser navigation
D. Play Button	Newsletter	▶ → auto-decode → instant play
E. Manual Scan	Page main QR	Scan one by one (works offline)

Storage Layer	Medium	Durability
Physical	Quartz glass / UV laminate	1,000 yr+
Public	NDL deposit (newsletter PDF)	Permanent
Private	GitHub + PWA offline	Immediate

All paths use ISO / WHATWG standards only — zero proprietary dependencies. Under 100 lines of added code.

MIGRATION ROADMAP

Component	Current	Migration Candidate	Trigger	Phase
Email Delivery	GAS + Gmail (100/day)	**Amazon SES (62,000/mo)**	Orders > 100/day	Phase 2
Production	Manual (print, laminate, pack, ship)	**Domestic outsource (turnkey)**	Orders > 50/day	Phase 2
Partner Payouts	Wise manual (monthly batch)	CSV batch → API automation	Volume increase	Phased
Voice Codec	Codec2 WASM (450 bps)	Next-gen low-bitrate codec	QR capacity up or quality demand	10-yr audit
QR Standard	Version 40, ECC-L (2,953B)	rMQR / JAB Code / next-gen 2D	ISO update & reader adoption	10-yr audit
Playback Stack	WebAudio API + WASM	Successor browser APIs	API deprecation notice	10-yr audit

> Design seams in advance; act before crisis. Swapping a single sendEmail() migrates GAS to SES. Every component is independently replaceable — zero lock-in.