WORKFORCE

DECENTRALIZED FREELANCER ECOSYSTEM

System Flow Overview

Here's how your full system works, phase by phase, from user action to blockchain

1. User Interaction Layer (Frontend)

Built with **Next.js**, the frontend provides:

- User registration & login
- Invoice creation
- Payment flow (via Stripe)
- Reputation dashboard
- AI invoice validator

Users are **freelancers** or **clients** — both interact through this dashboard.

2. API Gateway & Core Backend (NestJS)

NestJS acts as the **central orchestrator**.

It exposes clean REST endpoints to the frontend (like /auth, /invoices, /payments).

Every module handles one part of the ecosystem:

- **AuthModule:** Handles user sign-up/login via JWT.
- **InvoicesModule:** CRUD for invoices (with amount, description, due date, status).
- **PaymentsModule:** Connects Stripe for fiat payments.
- **ValueLinkModule:** Manages value relationships between users (trust link system).

🧩 *Think of this as the "server brain" — it coordinates everything.*

3. Database Layer (MYSQL + Prisma)

Stores all off-chain data: users, invoices, payments, and reputation metrics.

Prisma ORM provides schema control and migrations.

This is your **source of truth before blockchain integration**.

🧱 Example:

User -> creates invoice -> stored in DB -> assigned status = DRAFT

4. Payment & Escrow Simulation (ChainBill logic)

Once an invoice is created:

- The client pays through **Stripe**.
- Backend listens to **Stripe Webhooks** for payment success.
- Status changes from DRAFT → PAID → RELEASED.
- The system holds payment in a simulated **escrow table**.

This simulates the blockchain escrow logic off-chain.

💡 *"At this stage, payments are verified by Stripe and status changes are automated."*

5. Blockchain Layer (KeyLink logic)

When we move to blockchain (Phase 3):

Each paid invoice → **minted as an NFT** on **Aptos**.

Each verified freelancer → **gets a SoulBound Token (SBT)** representing trust score.

Payments or escrow contracts are deployed in **Move language** on Aptos.

🪙 Flow example:

User pays invoice → backend triggers blockchain mint → invoice NFT created → ownership proof on-chain

This ensures **transparency and proof of work/value** between both parties.

6. AI Validation Layer (Optional, Phase 4)

Here's where AI makes it smarter:

AI validates invoices:

- Checks structure (amount, terms, client name)
- Suggests payment terms or due dates
- Detects anomalies (e.g. fake or duplicate invoices)

AI summarizes invoice history for clients/freelancers.

🧠 "Like an automated assistant for financial and contract hygiene."

7. Storage & Privacy (Phase 5)
Invoices, contracts, and proof documents are encrypted and uploaded to **IPFS** (via Pinata SDK).
Each file's **hash** is stored on-chain for authenticity.
Only encrypted links are visible in the DB.
🔐 "So your invoice PDF becomes tamper-proof and decentralized."

8. Dispute Resolution & Reputation (Phase 6)
If a freelancer or client disagrees on payment/work:
They raise a **dispute**.
A pool of verified users (DAO jurors) votes on the case.
The result updates **Reputation Scores** on their SBT.
⚖️ *This gamifies trust — reliable users earn higher reputations.*

9. Real-Time + Scale (Phase 7)
Use WebSockets or Redis to notify users in real-time:

- Invoice paid
- AI validation complete
- Dispute resolved

This gives a smooth UX similar to fintech dashboards.

ELEVATOR SUMMARY

- We're building a decentralized freelancer ecosystem where every invoice, payment, and reputation is transparent, verifiable, and AI-validated. It merges the accountability of KeyLink with the transactional integrity of ChainBill — giving freelancers and clients a trustless way to work together.

BLOCKCHAIN LAYER (KEYLINK LOGIC)

- • Aptos blockchain using Move.
- • Each paid invoice = NFT.
- • Freelancers earn SBTs (trust).
- • Ensures proof of value and transparency.

EXAMPLE END-TO-END FLOW

- 1. Freelancer Aarav creates invoice (₹10,000).
- 2. Client Riya pays via Stripe.
- 3. Invoice = NFT minted on Aptos.
- 4. IPFS hash stored.
- 5. Aarav's trust score increases.
- → Transparent, AI-verified payment system.

CONCLUSION

- KeyLink + ChainBill creates a unified, AI-enhanced freelancing platform.
- Bridging automation and transparency, it empowers freelancers and clients with blockchain trust.

- No middlemen. No fraud. Pure trust and value.