BallisticPay: A Comprehensive Architecture for Decentralized Payroll, UBI, and Capital Growth

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Abstract

This paper presents BallisticPay, a blockchain-native infrastructure designed to revolutionize salary distribution, employee identity, and passive income generation. The system integrates Universal Basic Income (UBI) principles, capital investment, and programmable token-based salary disbursement into a decentralized architecture. We outline the key challenges in contemporary payroll systems and detail our proposed architecture's modules, including token preference mechanisms, decentralized identity, UBI deductions, capital deployment strategies, and year-end bonus distribution. The solution offers a flexible, secure, and growth-focused payroll system particularly suited for the crypto-native and globally distributed workforce.

1 Introduction

BallisticPay is a decentralized, blockchain-native infrastructure designed to revolutionize salary distribution, employee identity, and passive income generation through a structured and autonomous system. In today's traditional financial systems, payroll is linear, centralized, and often inefficient across borders. BallisticPay seeks to decentralize this process, integrating the powerful principles of Universal Basic Income (UBI), capital investment, and programmable token-based salary disbursement.

Built for the crypto-native and globally distributed workforce, BallisticPay offers flexible, secure, and growth-focused payroll where salaries aren't just paid—they're optimized.

2 What Problems Is BallisticPay Solving?

2.1 Inflexible Salary Payments

Traditional payroll systems only support fiat currencies and centralized banking, which excludes millions of gig economy workers and cross-border teams in emerging markets.

2.2 Unstable Income in Crypto Payroll

Paying salaries in volatile cryptocurrencies exposes employees to unpredictable income due to fluctuating token values.

2.3 Lack of Integrated Wealth Accumulation

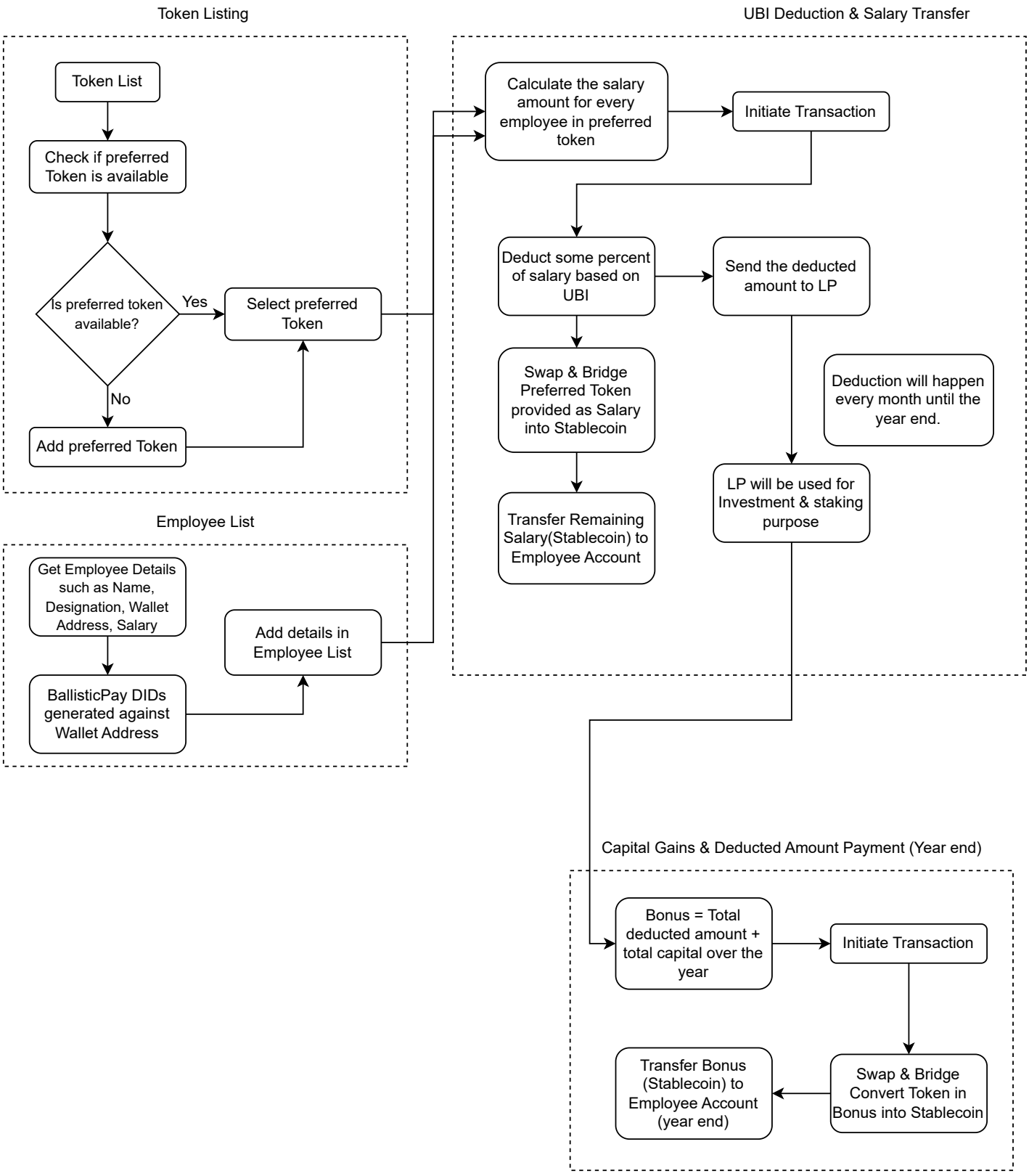
Conventional systems rarely offer built-in saving or investment mechanisms, causing many workers to miss out on long-term financial benefits.

2.4 Absence of Structured UBI Mechanisms

UBI systems often rely on unsustainable airdrops and inflationary token models. There is no efficient way to blend UBI with payroll in a non-dilutive way.

2.5 Missing On-chain Identity for Employees

Web3 systems lack verifiable, interoperable identity structures that are critical for secure employee recognition and benefits assignment.


Token Listing
Token List
Check if preferred Token is available
Is preferred token available?
Yes
Select preferred Token
No
Add preferred Token
Employee List
Get Employee Details such as Name, Designation, Wallet Address, Salary
BallisticPay DIDs generated against Wallet Address
Add details in Employee List
UBI Deduction & Salary Transfer
Calculate the salary amount for every employee in preferred token
Initiate Transaction
Deduct some percent of salary based on UBI
Send the deducted amount to LP
Swap & Bridge Preferred Token provided as Salary into Stablecoin
Deduction will happen every month until the year end.
Transfer Remaining Salary(Stablecoin) to Employee Account
LP will be used for Investment & staking purpose
Capital Gains & Deducted Amount Payment (Year end)
Bonus = Total deducted amount + total capital over the year
Initiate Transaction
Transfer Bonus (Stablecoin) to Employee Account (year end)
Swap & Bridge Convert Token in Bonus into Stablecoin

3 Solution Overview

BallisticPay tackles these issues through a multi-layered architecture that combines:

- Token preference and swap mechanisms
- Decentralized identifiers (DIDs) for identity
- UBI-based deductions and capital deployment
- Automated liquidity provisioning and staking
- Year-end capital returns and bonuses

Let's explore each module in detail.

4 Detailed Architecture

4.1 Token Listing Module

In a decentralized and globally distributed workforce, employees may have varying preferences regarding the type of tokens they receive as salary. Recognizing this diversity, BallisticPay introduces a Token Listing Module designed to empower employees with the ability to customize their salary payout in the cryptocurrency of their choice. This flexibility enhances employee satisfaction and fosters trust in crypto-native organizations.

The process begins by querying a token registry or decentralized exchange (DEX) aggregator APIs to fetch an updated list of supported tokens. This list typically includes major assets such as ETH, MATIC, SOL, and USDC. Once presented with the list, the employee can select their preferred token for payroll disbursement. The system verifies the token's availability and compatibility with the underlying infrastructure (e.g., smart contract standards, network support).

If the desired token is not present in the default listing, the employee is provided an interface to request the addition of a new token. This action triggers a validation pipeline, where the token's metadata, contract address, liquidity, and volatility are reviewed by the system or governing DAO. Upon approval, the token is added to the list, making it available for future selections.

This module serves two strategic purposes: it decentralizes the decision-making around payroll preferences, and it future-proofs the platform by allowing seamless integration of emerging tokens. It also positions BallisticPay as a flexible, inclusive, and protocol-agnostic payroll infrastructure.

Key Features:

- Real-time fetching of supported tokens via integrated APIs.
- Custom token request and validation workflow.
- Protocol-agnostic token support.
- Enhanced autonomy in salary preferences.

Purpose: Enables customizable, token-native salary choices for a globally diverse, decentralized workforce, improving accessibility and autonomy.

4.2 Employee Registration and DID Module

To establish a secure and verifiable identity layer, BallisticPay incorporates a decentralized onboarding mechanism through Decentralized Identifiers (DIDs). When an employee is registered into the system, their personal information—including name, designation, wallet address, and salary—is captured and used to generate a DID using industry-standard protocols such as Ceramic or ION.

This DID acts as a unique on-chain representation of the employee's identity, cryptographically linked to their wallet address. It enables seamless interaction with other modules within BallisticPay, including salary disbursement, UBI contributions, and bonus retrieval. The employee's DID and associated metadata are stored in a secure, append-only structure referred to as the Employee List.

DID-based architecture ensures both privacy and verifiability. The employee's real-world credentials remain protected while still enabling decentralized authentication. Wallet-based login and verification further simplify the interaction without relying on centralized credentials.

Flow:

1. Capture personal employee details.
2. Generate a DID linked to the employee's wallet.
3. Store the DID and employee metadata in the Employee List.

Key Features:

- DID generation for decentralized identity.
- On-chain, verifiable employee registry.
- Seamless wallet-based authentication.

Purpose: Ensures secure, privacy-preserving, and verifiable on-chain identities tied to real-world employee roles, establishing a foundation for decentralized interactions within BallisticPay.

4.3 UBI Deduction & Salary Transfer Module

The UBI Deduction and Salary Transfer Module serves as the financial core of BallisticPay, automating monthly payroll disbursements while embedding a sustainable Universal Basic Income (UBI) model that reinvests capital instead of distributing it passively.

What is UBI in BallisticPay? Universal Basic Income (UBI) generally refers to an unconditional, regular income given to all individuals irrespective of employment status (1). However, BallisticPay reinterprets UBI by introducing a self-funded approach. Rather than distributing external subsidies or printing inflationary tokens, a small fraction of each employee's salary is allocated into capital-productive DeFi strategies. This transforms UBI from a one-way distribution mechanism into a regenerative economic engine.

Operational Flow:

1. Compute employee salary in their selected token (e.g., ETH).
2. Deduct a predefined portion (e.g., 10%) as the UBI contribution.
3. Convert this portion into a stablecoin (e.g., USDC) to hedge against volatility.
4. Allocate the stablecoin into DeFi protocols like Aave, Compound, or Curve.
5. Transfer the remaining salary to the employee's wallet in the requested stablecoin.

Monthly Recurrence: This process is automated and recurs each payroll cycle. Over time, the DeFi allocations accumulate returns, forming a passive yield reserve tied to the employee's DID.

Key Features:

- Continuous capital reinvestment for long-term value.
- Risk-mitigated stablecoin usage.
- Transparent deductions visible on-chain.
- Non-inflationary, self-reliant UBI mechanism.

Purpose: This module balances present salary delivery with future capital growth. By anchoring deductions into stable, income-generating DeFi instruments, BallisticPay creates a self-sustaining UBI layer that supports employee wealth-building.

4.4 Capital Deployment and Yield Strategies

BallisticPay introduces an innovative approach to Universal Basic Income (UBI) by transforming employee contributions into productive capital. Rather than allowing deducted amounts to remain idle or be immediately disbursed, the system programmatically channels these stablecoin reserves into decentralized finance (DeFi) ecosystems to generate yield.

Capital Allocation Mechanism

Once employee UBI contributions are deducted and converted into a risk-mitigated stablecoin (e.g., USDC, DAI), these funds are routed to selected DeFi protocols through smart contracts. The platform supports three primary yield-generation strategies:

- **Lending Platforms (e.g., Aave, Compound):** Funds are lent out at fixed or variable APYs, generating interest over time. These platforms are ideal for conservative capital deployment with a relatively low risk profile.
- **Automated Market Makers (AMMs) (e.g., Curve, Uniswap v3):** Liquidity provisioning to high-volume pools enables the platform to capture trading fees, albeit with an elevated risk of impermanent loss. BallisticPay limits exposure by selecting stable-stable pools with high depth and low volatility.
- **Yield Aggregators (e.g., Yearn, Beefy):** These smart contract-based vaults actively reallocate capital across multiple strategies to maximize returns. Aggregators provide built-in optimization logic, automating rebalancing and risk management to ensure yield maximization with minimal manual intervention.

Intelligent Deployment Governance

To ensure strategic capital allocation and mitigate systemic risks, BallisticPay incorporates both AI-driven logic and community-based governance:

- **AI Agent Optimization:** An embedded agent monitors DeFi protocol health metrics—such as total value locked (TVL), audit status, APY fluctuations, protocol insurance availability, and historical volatility—to dynamically rebalance capital.
- **DAO Supervision:** All allocation strategies can be proposed, challenged, or modified through a decentralized autonomous organization (DAO). Governance token holders vote on rebalancing thresholds, protocol whitelists, and maximum exposure levels.

Security and Risk Management Considerations

Security underpins the capital deployment model:

- **Protocol Due Diligence:** Only protocols with a rigorous audit trail, high TVL, and community trust are permitted.
- **Real-Time Monitoring:** Smart contracts integrate with risk oracles to monitor pool health and adjust exposure as needed.
- **Withdrawal Safety Nets:** Emergency exits and liquidity buffer pools allow for rapid divestment in black swan scenarios.

Purpose: This module transforms UBI from a passive deduction into a dynamic capital engine. By allocating stablecoins to carefully vetted and algorithmically governed DeFi strategies, BallisticPay generates sustainable returns that can be redeemed at scale, ensuring long-term utility and growth for employees.

4.5 Year-End Capital and Bonus Redemption

Traditional financial systems often treat bonuses as discretionary, opaque, and centralized rewards. In contrast, BallisticPay offers a transparent, programmatic, and performance-linked model that uses accumulated yield from UBI investments to deliver year-end bonuses in a decentralized and automated fashion.

Bonus Computation Model

At the conclusion of each fiscal cycle (typically annual), BallisticPay initiates a bonus distribution protocol for all registered employees. The bonus mechanism is calculated using a combination of individual contribution records and the total yield accrued by their capital over time.

Flow Overview:

1. **Aggregate Individual Contributions:** The platform queries each employee's DID-linked record to calculate total salary deductions made for UBI over the year.
2. **Calculate Yield Performance:** Using yield-tracking smart contracts, the system determines the total interest and fees earned from deployed capital.
3. **Determine Bonus Proportions:** Each employee receives a share of the total yield pool proportional to their contribution and participation duration, optionally adjusted by company-specific multipliers or governance incentives.

4. **Stablecoin Redemption:** Yield and principal are converted back into a stablecoin to ensure a predictable payout. Depending on the employer or DAO preference, employees may also opt to receive bonuses in governance tokens or reinvest in yield-bearing instruments.

5. **On-chain Disbursement:** The bonus is directly transferred to the employee's wallet, linked through their DID, ensuring transparent, verifiable delivery.

Vesting Logic (Optional)
BallisticPay supports customizable vesting schedules for bonus disbursement to encourage retention:

- **Cliff-based Vesting:** A portion of the bonus is locked for a minimum time period (e.g., 6 months).
- **Linear Vesting:** Gradual unlocking of bonus amounts over time.
- **Performance Multiplier:** Employees contributing above a certain threshold can unlock faster or larger vesting proportions.

These rules are fully auditable on-chain and adjustable via DAO governance.

Purpose: This module redefines the concept of bonuses by aligning them with actual yield performance, employee participation, and transparent distribution logic. It not only creates a strong incentive model for retention but also fosters financial literacy and participation in decentralized finance.

5 Conclusion

BallisticPay represents a paradigm shift in how organizations handle payroll, employee identification, and wealth creation in the blockchain era. By integrating decentralized identity with automated UBI deductions, capital deployment, and yield-based bonuses, we create a holistic ecosystem that serves both immediate salary needs and long-term financial growth.

The architecture addresses the fundamental limitations of traditional payroll systems while embracing the flexibility and transparency of blockchain technology. Each module—from token selection to year-end bonus redemption—works in concert to deliver a comprehensive solution that scales across organizations and jurisdictions.

As decentralized finance and Web3 ecosystems continue to mature, infrastructure like BallisticPay will become increasingly essential for organizations seeking to operate in a truly global, crypto-native manner. The self-sustaining UBI model, in particular, offers a blueprint for how employment benefits can evolve beyond simple compensation into true wealth-building mechanisms.

Future research will focus on expanding the protocol's cross-chain capabilities, enhancing the yield optimization algorithms, and developing governance structures that align incentives across all stakeholders in the payroll ecosystem.

References

[1] Widerquist, K. (2013), *Basic Income: An Anthology of Contemporary Research*, Wiley-Blackwell.