Here's a **detailed Proof of Concept (POC) plan** for **Qryptum**, structured to be developed within one month by a team of **two resources**. This plan includes **milestones, technology stack, and execution strategy** to help you build a small MVP that can be presented to investors.

Qryptum - Proof of Concept (POC) Plan

Goal:

Develop a working **testnet prototype** demonstrating Qryptum's **Proof of Data** concept, miner wallets, basic rewards mechanism, and a block explorer.

Duration:

1 Month (4 Weeks)
Team: 2 developers (1 Blockchain, 1 Full-Stack)

Technology Stack

Blockchain Layer (Backend)

- **Programming Language:** Python / Rust
- **P2P Networking:** libp2p (for peer-to-peer networking)
- **Cryptography:**
  - pycryptodome (Python)
  - crypto/ecdsa (Go) for signing transactions
- **Database:** SQLite or JSON-based ledger for testnet
- **Hashing Algorithm:** SHA-256 for block chaining

Frontend & API

- **Frontend:** React.js (Basic UI)
- **API Framework:** FastAPI (Python) or
- **Wallet System:**
  - Public/Private key encryption (ECDSA)
  - Store private keys locally for testnet
- **Block Explorer:** Simple web-based interface

Infrastructure

- **Testnet Deployment:**
  - AWS EC2 for node hosting

    - Docker for containerized blockchain nodes
- **Version Control & CI/CD:** GitHub, Docker

Milestones & Weekly Breakdown

Each **week** will focus on a crucial part of development, ensuring the MVP is ready for demonstration.

Week 1 - Blockchain Core & Proof of Data

Deliverables:
Objectives:

- Establish the core blockchain structure.
- Implement a working **Proof of Data** mechanism.

Day 1-2: Setup & Initialization

- Set up the project repository (GitHub).
- https://github.com/corda/corda
- https://github.com/ethereum/go-ethereum
- Define project structure and directory layout.
- Initialize Python blockchain environment.
- Implement basic SHA-256 hashing functions.

Day 3-4: Block Structure & Genesis Block

- Define block structure:
    - Block number, timestamp, previous hash, transactions, and miner rewards.
- Implement block validation rules.
- Create Genesis Block and validate its immutability.

Day 5-6: Proof of Data Mechanism

- Accept JSON/Text data as transactions.
- Implement uniqueness validation using a hash table.
- Validate data format and completeness.
- Develop an in-memory ledger (to be replaced by SQLite later).

Day 7: Internal Testing & Debugging

- Validate block creation with multiple test transactions.
- Ensure successful linking between blocks.
- Conduct unit testing for blockchain functions.

Tech Used: Go/Python, SHA-256, SQLite

Week 2 - Network & Consensus

Deliverables:

Objectives:

- Develop the **P2P networking layer** for node communication.
- Implement basic transaction submission and validation.

Day 1-2: P2P Network Architecture

- Implement libp2p for peer-to-peer messaging.
- Configure basic networking layer for nodes to communicate.

Day 3-4: Testnet Configuration

- Set up **3-5 testnet nodes** (Bootstrap server, Miners, Validators).
- Enable nodes to broadcast transactions and blocks.

Day 5-6: API for Transactions & Blocks

- Develop endpoints:
  - `/submit-data` → Accept transactions.
  - `/blocks` → Fetch latest blocks.
  - `/rewards` → View miner rewards.

Day 7: Test & Debugging

- Simulate transactions across nodes.
- Debug connectivity issues and refine data propagation.

Tech Used: Python/Go, libp2p, SQLite

Week 3 - Miner Wallets & Rewards System

Deliverables:

Objectives:

- Implement **wallet system** for miners.
- Introduce **testnet token rewards** for data submissions.

Day 1-2: Wallet System Development

- Generate public/private key pairs (ECDSA).
- Develop a simple command-line wallet interface.

Day 3-4: Secure Data Submission

- Allow miners to submit **digitally signed** transactions.
- Implement **signature verification** before processing data.

Day 5-6: Rewards & Token System

- Assign **10 testnet tokens** per valid submission.
- Store miner balances in SQLite.
- Implement reward calculation functions.
- Total Supply: 10 Billion
- Token Price: 0.030
- Token Name: Qryptym
- Token Symbol: QRY

Day 7: Test & Debugging

- Test wallet creation and balance updates.
- Verify token distribution logic.

Tech Used: ECDSA (crypto libraries), SQLite, API for transactions

Week 4 - Block Explorer, UI & Final Testing

Deliverables:

Objectives:

- Build a **simple Block Explorer UI**.
- Develop a frontend for **miners to interact** with the system.
- Conduct **final system-wide testing** and deploy the testnet.

Day 1-2: Block Explorer UI

- Display latest blocks, transactions, and miner rewards.

Day 3-4: Miner Dashboard Development

- Login with wallet credentials.
- Data submission form for miners.
- Real-time rewards tracking.

Day 5-6: Final Testing & Debugging

- Simulate multiple miners submitting data.
- Validate **block creation, transaction processing, and rewards**.

Day 7: Deployment & Demo Preparation

- Deploy testnet nodes on AWS/DigitalOcean.
- Open access to external miners.
- Final walkthrough for investor presentation.

Tech Used: React.js, FastAPI/Go Fiber, SQLite, AWS/DigitalOcean

Final Deliverables (Investor Demo)

Blockchain Testnet: Functional Proof of Data mechanism & blockchain prototype.

Wallet System: Miners create wallets & submit data.

Rewards System: Miners receive testnet tokens.

Frontend UI: Simple explorer and miner dashboard.

Demo Preparation: Walkthrough of miner registration, data submission, and blockchain validation.

Execution Strategy

Resource 1 (Blockchain Dev):

- Set up blockchain core & Proof of Data mechanism
- Implement P2P networking & testnet
- Design consensus mechanism & reward system

Resource 2 (Full-Stack Dev):

- Develop API & wallet system
- Create frontend (React.js) & block explorer

- Host testnet & ensure cloud deployment

Next Steps After POC

Implement **Quantum-Resistant Security** (QuantaSecure Protocol).
Upgrade to **decentralized storage** (IPFS/Filecoin).
Introduce **smart contracts** for complex validation logic.

With this structured **1-month plan**, our team can deliver a functional **Qryptum Testnet MVP** that demonstrates the core concept to investors.