



BALANCED

White paper
v1.3

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Introduction

Balanced is a DAO (Decentralized Autonomous Organization) consisting of a decentralized balance sheet of ICX collateral, with the vision of creating a vibrant ecosystem of tokens pegged to the value of real-world assets. It allows users to mint and retire pegged assets, while also providing market makers with clearly defined arbitrage opportunities. The initial iteration of Balanced will support the minting and retiring of USD-pegged assets referred to as ICON Dollars (ICD).

Participants must deposit ICX collateral in order to mint pegged assets, and all collateral deposits are offered to arbitrage traders to maintain the value of the pegged assets. Users will be rewarded with Balance Tokens (BAL) in exchange for collateral contributions and participation in Balanced. This process will be referred to as “mining”. Balance Tokens represent ownership in the Balanced DAO and come with several benefits discussed in the Balance Token Economics section of this paper.

The Balanced Team believes an excellent use case of blockchain protocol tokens such as ICX is to be used as a form of collateral. Balanced can facilitate the minting of any asset with sufficient liquidity and price discovery, such as fiat currencies, commodities, equities, and more; all backed by ICX and secured by the ICON blockchain. While being used for transaction fees and staking gives meaningful value to ICX, Balanced will expand this utility by turning ICX into the reserve backing of any asset listed on the network.

Collateral Management

The only form of collateral accepted by Balanced is ICX. Borrowers (participants that deposit collateral and mint pegged assets) must overcollateralize their debt by a minimum of 400% (Mandatory Collateral Ratio). For example, if a borrower deposits \$400 worth of ICX, Balanced will give them the right to mint up to 100 ICD.

If a borrower drops below the Mandatory Collateral Ratio, the borrower no longer has the right to withdraw collateral from the network. The borrower will not have access to their collateral until the Mandatory Collateral Ratio of 400% is met.

While dropping below the Mandatory Collateral Ratio locks collateral, dropping below the Liquidation Ratio will result in permanent loss of the borrower's remaining collateral. The Liquidation Ratio is 150%.

sICX

ICX has a built-in reward rate for staking and voting on the ICON Network. Because of this feature, users would be reluctant to use their ICX as collateral knowing they would be missing out on these rewards.

To solve this problem, ICX collateral will first be deposited into a staking and voting smart contract (Staking Pool). When a user deposits collateral into the Balanced collateral pool, the ICX first gets converted into sICX (Staked ICX), then sICX is deposited as collateral. The amount of sICX received is a function of the amount of ICX in the Staking Pool and the total sICX outstanding. The amount of sICX received for deposits into the Staking Pool will be based on the following formula:

Exchange Rate of sICX

Amount of ICX in the Staking Pool / Total sICX Outstanding

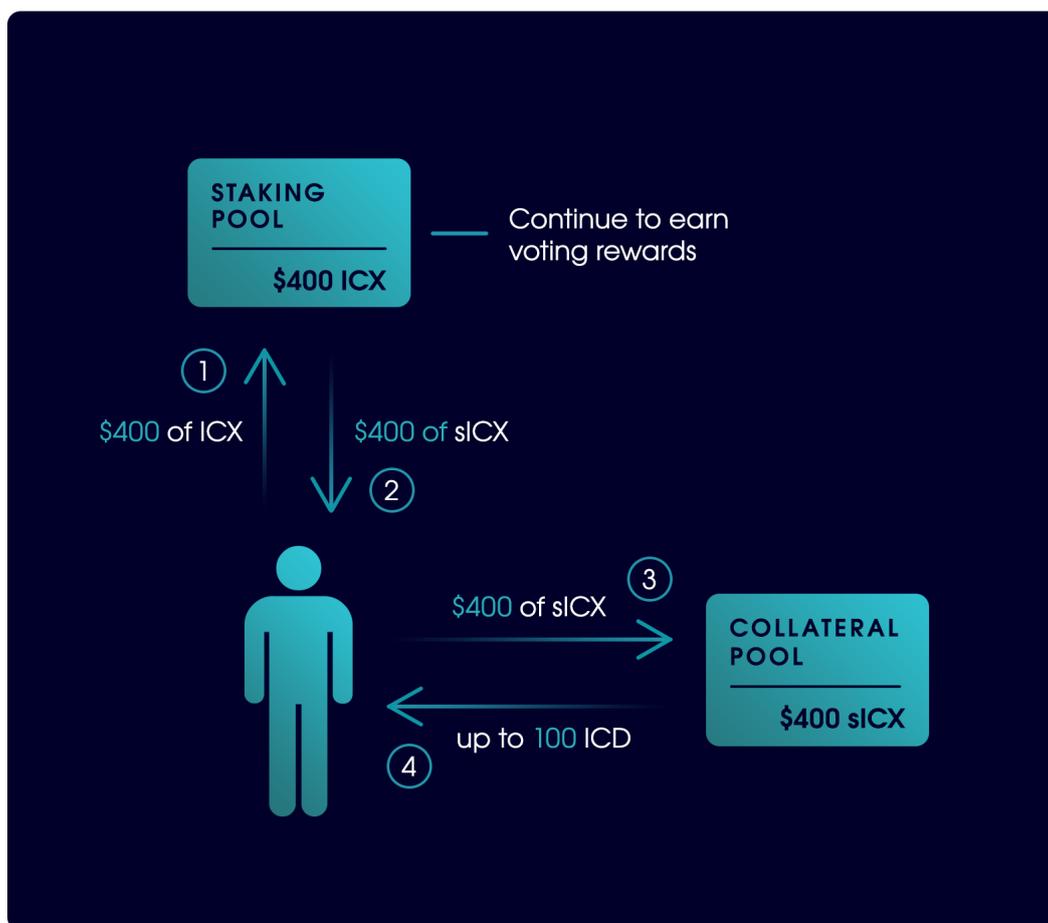


Figure 1: \$400 of ICX being converted into sICX

The ICX in the Staking Pool will be staked and delegated. I-Score will be claimed, ICX will be re-staked, and re-delegated every time a user deposits ICX into the Staking Pool. Balance Token holders will have the right to direct delegations of the Staking Pool to specific nodes on the ICON Network (P-Reps).

1 sICX will always have the claim to its pro-rata share of the ICX in the Staking Pool. For example, if somebody holds 10% of all sICX, and there is 500,000 ICX in the Staking Pool, this person can convert their sICX into 50,000 ICX. When converting sICX into ICX, the ICX will not be received until the unstaking period is complete. The unstaking period varies on the ICON Network, and can range anywhere from 5 days to 20 days. Given the lengthy unstaking period, Balanced will also provide a decentralized exchange (DEX) to provide immediate liquidity for swapping between sICX and ICX for a nominal fee.

Stability and Arbitrage

The stability of pegged assets minted by borrowers is ensured via constant arbitrage opportunities provided by the Balanced decentralized balance sheet. Collateral deposits are used to support arbitrage traders at all times. 1 ICD will always have the right to claim 1 dollar's worth of sICX from the collateral pool. The value of ICX and sICX will be provided by an Oracle solution.

When an arbitrage trader takes advantage of this opportunity, collateral is sold by all Balanced participants on a pro-rata basis according to their relative debt within the network. The debt of each participant is then lowered by the amount of collateral sold. This arbitrage mechanism ensures that the value of pegged assets on exchanges will always remain close to their true value.

As more borrowers participate in Balanced, the effect of an arbitrage trader becomes less and less noticeable to the individual. The minimum amount of ICD to take advantage of arbitrage opportunities is 50 ICD.

As an example, imagine the total collateral pool is 2,500 sICX and total debt on Balanced is 500 ICD. For simplicity purposes 1 sICX = 1 USD and no fees will be included in this example. Borrower A accounts for 20% (100 ICD) of the debt and Borrower B accounts for 80% (400 ICD) of the debt. Arbitrage Trader has purchased 50 ICD on an exchange for only 40 USD and would like to take advantage of the arbitrage opportunity provided by Balanced.

Arbitrage Trader visits the Balanced Dashboard to convert 50 ICD into 50 USD worth of sICX. Borrower A accounts for 20% of the debt, therefore Borrower A will automatically sell \$10 worth of their collateral to Arbitrage Trader. In return for selling \$10 worth of collateral, Borrower A's debt is decreased by 10 ICD (from 100 ICD to 90 ICD). Additionally, Borrower B accounts for 80% of the debt, therefore Borrower B will automatically sell \$40 worth of their collateral to Arbitrage Trader. In return for selling \$40 worth of collateral, Borrower B's debt is decreased by 40 ICD (from 400 ICD to 360 ICD). In terms of value, neither Borrower A nor Borrower B has

lost anything. For every 1 dollar's worth of collateral sold, their debt was decreased by 1 ICD.

Please refer to Figure 2 below for a visual representation of the aforementioned example.

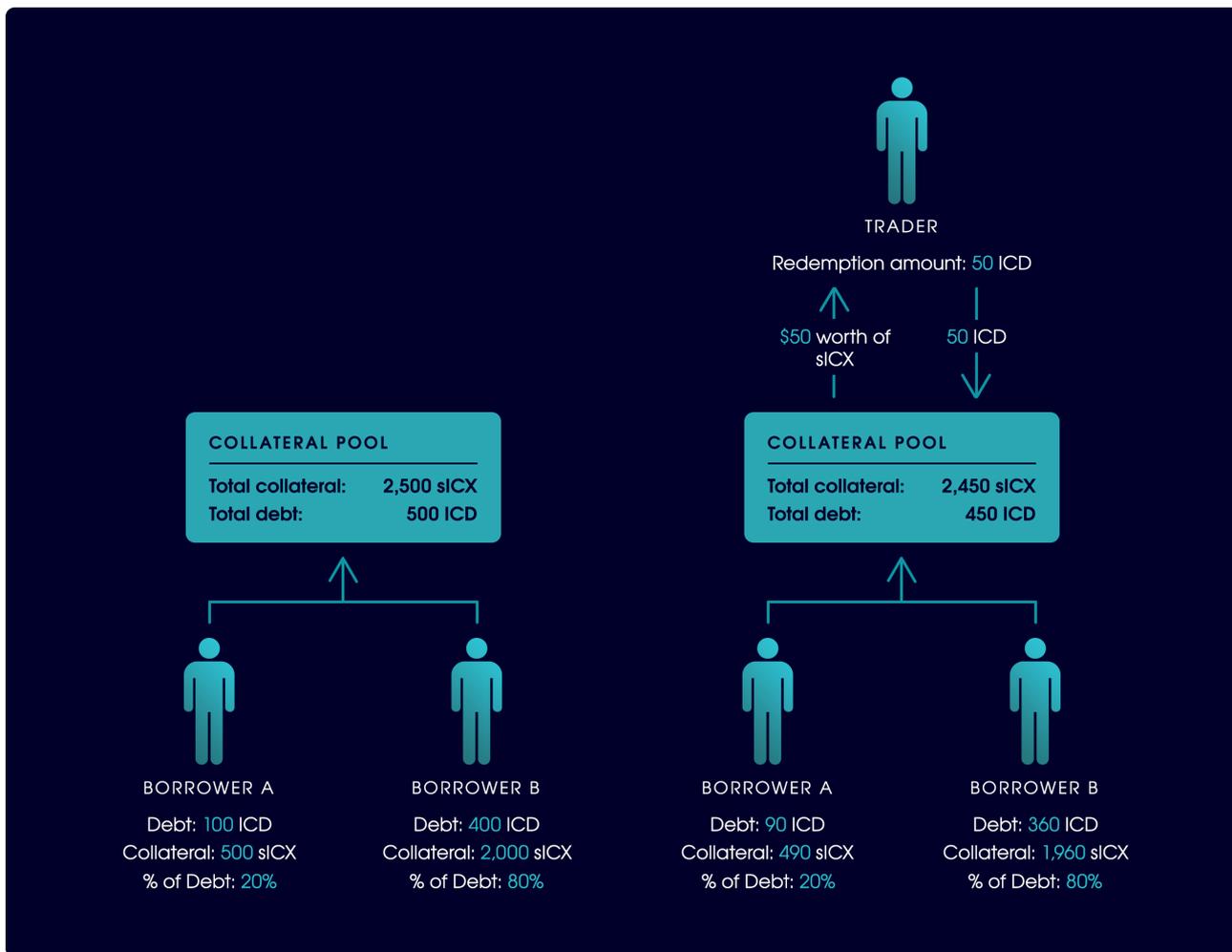


Figure 2: Arbitrage process

Liquidation Policy

If a borrower drops below the Liquidation Ratio of 150%, the borrower will permanently lose access to their remaining collateral. Their unpaid debt will be tracked and referred to as “bad debt”. The collateral will be held by Balanced and used to field redemptions of pegged assets. This provides a clear incentive for borrowers to begin paying off their debt or depositing more collateral if the price of ICX begins to fall.

Liquidated collateral will be set aside into a Forced Liquidation Pool and will be the first collateral used to honor redemptions of pegged assets. For example, if there is \$75 worth of collateral in the Forced Liquidation Pool and a trader would like to redeem \$100 worth of collateral in exchange for 100 ICON Dollars, \$75 worth of collateral will come from the Liquidation Pool and the remaining \$25 worth of collateral will come from borrowers as described in the “Stability and Arbitrage” section of this paper. The \$75 worth of collateral sold will also lower the Bad Debt amount by 75 ICD.

Gamified Liquidation

Activating a liquidation must be handled by users because Balanced is structured as a DAO. If Balanced proprietary software activated liquidations, Balanced would be a single point of failure for the network. Therefore, Balanced will offer a monetary incentive simply for alerting the network that an individual borrower has dropped below the 150% Liquidation Ratio.

Additionally, those that redeem the liquidated collateral by retiring pegged assets will receive the collateral at a fixed discount. Keep in mind that liquidated collateral will be approximately 150% of the Bad Debt. Details for the gamified liquidation are as follows:

- The reward for triggering a Forced Liquidation will be 1% of the value of the Bad Debt
- The bonus for retiring pegged assets against the Forced Liquidation Pool will be up to 10% of the pegged assets retired

For example, imagine Bob has \$299 worth of collateral, but his debt is 200 ICON Dollars. Bob's collateral ratio is currently 149.5%, which is below the Forced Liquidation Ratio of 150%.

Alice notices Bob is below the Forced Liquidation Ratio. Alice will then send a transaction to Balanced to trigger the Forced Liquidation of Bob. In exchange for this work, Alice will receive \$2 worth of Bob's collateral (1% of Bob's Bad Debt) before it goes into the Forced Liquidation Pool.

The Forced Liquidation Pool now has \$297 worth of collateral and Balanced now has a bad debt of 200 ICON Dollars. Meanwhile, Charley has been holding ICON Dollars waiting to earn rewards for paying off the bad debt of other users. Charley uses 200 ICON Dollars to retire the 200 ICD of bad debt. In exchange for providing this service to Balanced, Charley receives \$220 worth of collateral, an extra 10% (200×1.10) for retiring bad debt.

Handling Edge Cases

While the economic design of Balanced is equipped to handle extreme fluctuations in the value of ICX, Balanced must still be prepared for the worst case scenario. In order to handle edge cases, such as extreme price drops in short periods of time, Balanced employs an Emergency Reserve Fund and a concept known as Dead Markets.

Emergency Reserve Fund

In extreme circumstances where the value of bad debt of a particular pegged asset is greater than the value of the Forced Liquidation Pool, an Emergency Reserve Fund will be made available for outside traders.

5% of Balance Tokens mined on a daily basis are sent to the Emergency Reserve Fund and collateral held in the Liquidation Pool after all Bad Debt of active markets (not dead) is paid will be swept to the Emergency Reserve Fund.

Dead Markets

If the net bad debt of a pegged asset, defined as bad debt minus the value of the Forced Liquidation Pool, is greater than the value of all open positions for that asset, the pegged asset will be marked as a Dead Market. Dead Markets can be revived when the aforementioned situation is no longer true.

When marked as a Dead Market, the bad debt of these pegged assets will be paid off over time by the Emergency Reserve Fund, any additional liquidated collateral from that pegged asset will go straight to the Emergency Reserve Fund, and no new originations of that pegged asset can occur.

Debt Waterfall

The debt waterfall decides where the collateral comes from when an outside trader visits Balanced in order to retire pegged assets and redeem their equivalent value in ICX.

1. Liquidation Pool (Used to pay bad debt)
2. Borrowers of the retired pegged asset
3. Emergency Reserve Fund (Used to pay bad debt of Dead Markets)

The below example details the worst case scenario for Balanced, where the debt waterfall reaches the Emergency Reserve Fund.

Bob visits Balanced to retire 1,000 ICD as the price of ICX is dropping.

- Bad Debt: 1,000
- Forced Liquidation Pool: \$0
- Value of all open ICD Positions: 0 (everybody has been liquidated)
- Emergency Reserve Fund: \$5,000 worth of collateral

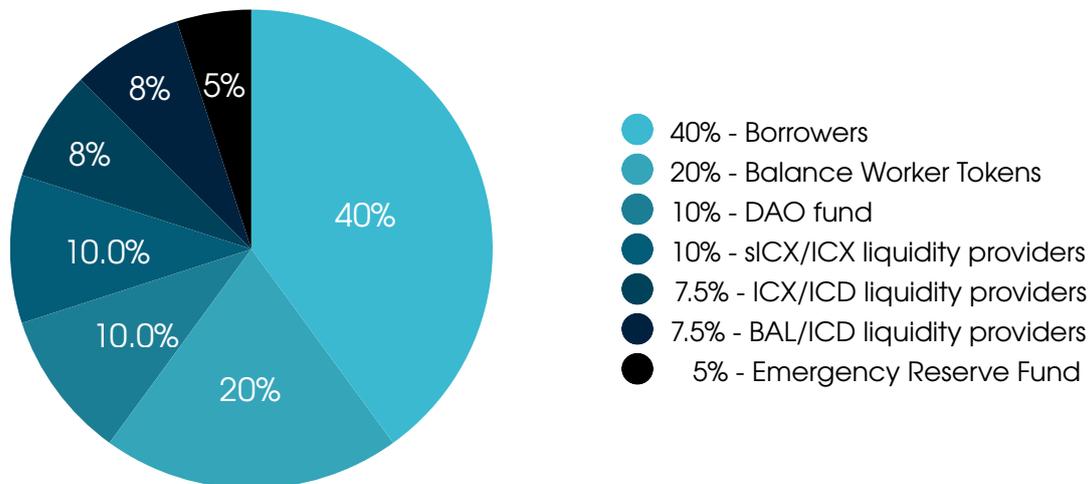
Since the net bad debt of ICD is greater than the value of all open ICD positions, ICD will be marked as a Dead Market. Since ICD is a Dead Market, Bob's 1,000 ICD retirement will be paid by the Emergency Reserve Fund. When Bob retires the 1,000 ICD, Bob will receive \$1,000 worth of collateral from the Emergency Reserve Fund, Bad Debt will be set to 0, and ICD will no longer be a Dead Market.

Balance Token Economics

Balance Tokens represent ownership in the Balanced DAO. They are entitled to governance and network fees, and are mined by providing liquidity on the DEX and/or having an open position on Balanced with at least a 500% collateral ratio.

There will be no pre-mine of Balance Tokens and there is no maximum supply. 100,000 tokens will be mined per day for the first 720 days of operation. On the 721st day, the amount mined per day will begin to decrease by .50% each day until reaching 5,000 tokens per day to perpetuity. This results in a sub 2% inflation rate and continued incentivization to use Balanced.

Distribution of Balance Tokens



Balance Worker Tokens provide continued incentives to develop the platform and are explained in more detail in the Governance section of this paper. The DAO fund will hold BAL tokens, which BAL holders can vote on how to spend (i.e. to fund promotions and smart contract audits).

Mining Balance Tokens Through Borrowing

In order to mine BAL through borrowing, one must meet the following qualifications:

- Deposit collateral into Balanced
- Borrow pegged assets from Balanced
- Be at or above the Target Collateralization Ratio of 500%

After meeting the above qualifications, the formula to calculate an individual's mining rewards on any given day is a function of the amount of debt they have in the Balanced DAO relative to the total debt. The precise formula is detailed below:

Mining Rewards

$$(My\ Debt / Total\ Debt\ on\ Balanced) \times BAL\ Allocation\ to\ Borrowers$$

Mining Balance Tokens on the Decentralized Exchange

Mining BAL can also be done through trading on the Decentralized Exchange. At launch, two trading pairs will be able to mine BAL: the sICX/ICX pair and the ICX/ICD pair. These pairs are both important for the success of Balanced, with extra significance on the sICX/ICX pair in order to guarantee speedy liquidity for arbitrage traders. Only those buying sICX will be able to mine BAL, however, both sides of the trade will earn BAL for the ICX/ICD pair.

To qualify for these mining rewards, **traders must trade within 3% of the true value of sICX and ICD**. True value of ICD is based on the oracle data feeds, while the true value of sICX is determined by the going exchange rate at the Staking Pool. The amount of mining rewards earned by a specific trader are calculated as follows:

My DEX Mining Rewards

(My volume on trading pair XYZ / total volume on trading pair XYZ) x BAL allocation to trading pair XYZ.

Entitlements of Balance Tokens

In order to receive any of the following entitlements associated with holding Balance Tokens, one must first stake Balance Tokens from a wallet that also has debt in the Balanced Network. With this policy in place, only users of Balanced will be entitled to the benefits associated with Balance Tokens.

Network Fees

Below is a list of fees associated with using Balanced. All fees are adjustable via a token holder vote:

- **0.00% Transfer Fee** - Charged each time a pegged asset minted on Balanced is transferred from one wallet to another. The initial transfer fee will be set at 0%.
- **0.10% Decentralized Exchange Maker Fee** - Charged to market makers when trading on the Balanced Decentralized Exchange.
- **0.20% Decentralized Exchange Taker Fee** - Charged when executing a market order on the Balanced Decentralized Exchange.
- **0.25% Origination Fee** - Charged each time a borrower mints new pegged assets.
- **0.50% Redemption Fee** - Charged each time a non-borrower claims collateral in exchange for retiring a pegged asset.

All network fees will be split pro-rata amongst qualified Balance Token stakers and paid on a weekly basis.

Governance Power

The governance powers of Balance Token holders include, but are not limited to:

- Adjusting fees
- Adjusting interest rates
- Adjusting inflation rates
- Adjusting inflation allocations
- Adjusting the Balance Token unstaking period
- Adjusting Loan to Value (collateral ratio) requirements
- Adjusting the Balanced governance process
- Transferring Balance Worker Tokens (BWT)
- Spending the Balance Tokens held in the DAO fund

- Adding new pegged assets

Additionally, qualified Balance Token holders will have the right to delegate the ICX held in the Staking Pool on a pro-rata basis. For example, if somebody holds 10% of staked Balance Tokens, they can delegate 10% of the Staking Pool.

Governance

Balanced is a DAO owned and operated by Balance Token holders. Although Balanced is a DAO, it's still important to make sure a group of people are dedicated to actively developing the product. With Balance Worker Tokens ("BWT"), we can make this possible.

Balance Worker Tokens

Balance Worker Tokens are entitled to a certain portion of the daily Balance Token inflation. At launch, and unless Balance Token holders vote otherwise, Balance Worker Tokens will be entitled to 20% of the Balance Token inflation.

Balance Worker Tokens can be transferred two ways: either by the holders of the BWT or via a vote by Balance Token holders. There will only be 100 BWT, with the initial allocation being evenly split between the initial workers: ICX Station, PARROT9, iBriz, and Mousebelt.

Governance Process

The governance process of Balanced will start off simple, but is subject to change by Balance Token holders. More than 66% of staked Balance Tokens must vote in favor of any change or DAO fund proposal, all votes must meet a minimum quorum of 20% of staked Balance Tokens, and all votes will last for a minimum of 5 days.

Decentralized Exchange

Balanced will provide a simple decentralized exchange to facilitate liquidity for the following pairs:

- sICX : ICX
- ICX : ICD
- BAL : ICD

Liquidity between sICX and ICX is essential to support arbitrage traders. Given the importance of supplying liquidity to this pair, a portion of the daily Balance Token mining rewards will be allocated to traders supplying ICX liquidity within a 3% range from the true value of sICX. The true value of sICX is derived from the amount of ICX held in the Staking Pool divided by the amount of circulating sICX.

Team

Balanced DAO is a community led project started by four different P-Rep teams: ICX_Station, PARROT9, Mousebelt x AC3, and ICONOsSphere. The representatives of each team dedicated to this project are below:

Scott Smiley – ICX_Station Co-Founder, ICON Strategy Team

Scott earned his Master of Science in Finance (MSF) from Vanderbilt University in 2016, followed by two years of Investment Banking experience at Deutsche Bank specializing in Asset Backed Securities.

During his time at Deutsche Bank he dedicated his nights and weekends to self-education on the nascent blockchain and cryptocurrency space, eventually leading to his current role as Co-Founder of ICX Station and member of ICON's Strategy Team since April of 2018.

Daniel Brehmer, PhD – ICONOsSphere Founder

Dan is an applied research scientist at his core. He's spent more than 25 years directing scientific research, and over 15 years leading highly skilled teams. He studied semiconductor materials physics at UC Santa Barbara, and worked at Stanford's SLAC National Accelerator Laboratory, where he led development of soft X-ray vacuum ultraviolet beamlines and instrumentation for materials research until 2013.

An entrepreneur since 1992, he became progressively more involved in the entrepreneurial community after he moved to Silicon Valley in 2001. In 2013, he left the national lab to build products and businesses based on blockchain, data science, and research.

Galen Danziger – MouseBelt CTO

As the MouseBelt CTO, Galen works to implement and invest in emerging blockchain products. He's worked on software projects in gambling, fitness, internet

of things, and blockchain over the last decade, taking software products from an idea to serving hundreds of thousands of users. Currently, his focus is scaling the MouseBelt engineering team and delivering strong blockchain products to attract the next wave of users.

Lisa Verheul – Content Designer, PARROT9 Co-Founder

Lisa is a UX Writer for 1Password, an app that helps millions of people stay secure online. Over the last four years, she's been involved in every part of the user experience, from marketing, sales, and onboarding, to in-app wording, support articles, technical support, and webinars.

Dissatisfied with the quality of most digital services, she co-founded PARROT9, a company that specializes in user experience design. When she discovered blockchain, she knew it was far too complex for widespread adoption, so she's been building PARROT9 to fix it ever since.

Peter Denholm – UX Designer, PARROT9 Co-Founder

Peter has worked on over 300 design projects for more than 100 clients. He's spent the last five years working with a top 1% university, where he conducted UX research, optimized user flows, and increased conversions for various business units.

After he graduated in 2012, Peter started building PARROT9, a user experience design company that increases conversions for businesses. Recognising the untapped potential in the blockchain space, and an investor in ICON since the ICO, he decided to become an ICON P-Rep to help the ICON project lead with design.