Future of Pensions

Team BEN #2 presents:

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Introduction

Dear reader,

Pensions are in need of updating to prepare for a transitioning economy from manufacturing based to service based. There is a decreasing ratio of *working people:retirees* because of an aging population and an increasing trend of independents (startups, freelancers, fast changing careers) that don't add up/build a "second pillar" of funds through a large employer. Also, the coverage ratio, as in the ratio between the total capital available and the pension pay-out, has been negative for the past two years. Individuals have a difficult time understanding their pension and what they can expect of their future, which indicates that either it is too complex to understand or there is a lack of transparency. This is seen in studies showing a lack of confidence in pensions, which also exacerbates individuals choosing not to invest money into them. These developments/changes ask for a new way of organizing pensions. Therefore, Ben Team #2 in the track future of pensions for APG and PGGM present **NestEgg**.

Source: CBS

NestEgg provides a new way of organizing pensions. This document is divided in three parts after which a conclusion is given. The three parts serve to present the solution, explain its implications, how it works and what we need next to develop this in the coming three months. The three parts are subsequently *“Impact Canvas NestEgg”, “Contribution to Blockchain Ecosystem” and “Quality of Prototype*” with each its corresponding subparts, as given in the provided documents by the Dutch Blockchain Hackathon.

We are proud to present you this solution in the coming pages and are very willing to build this from a prototype into reality during the acceleration programme offered.

Best wishes,
BEN Team #2

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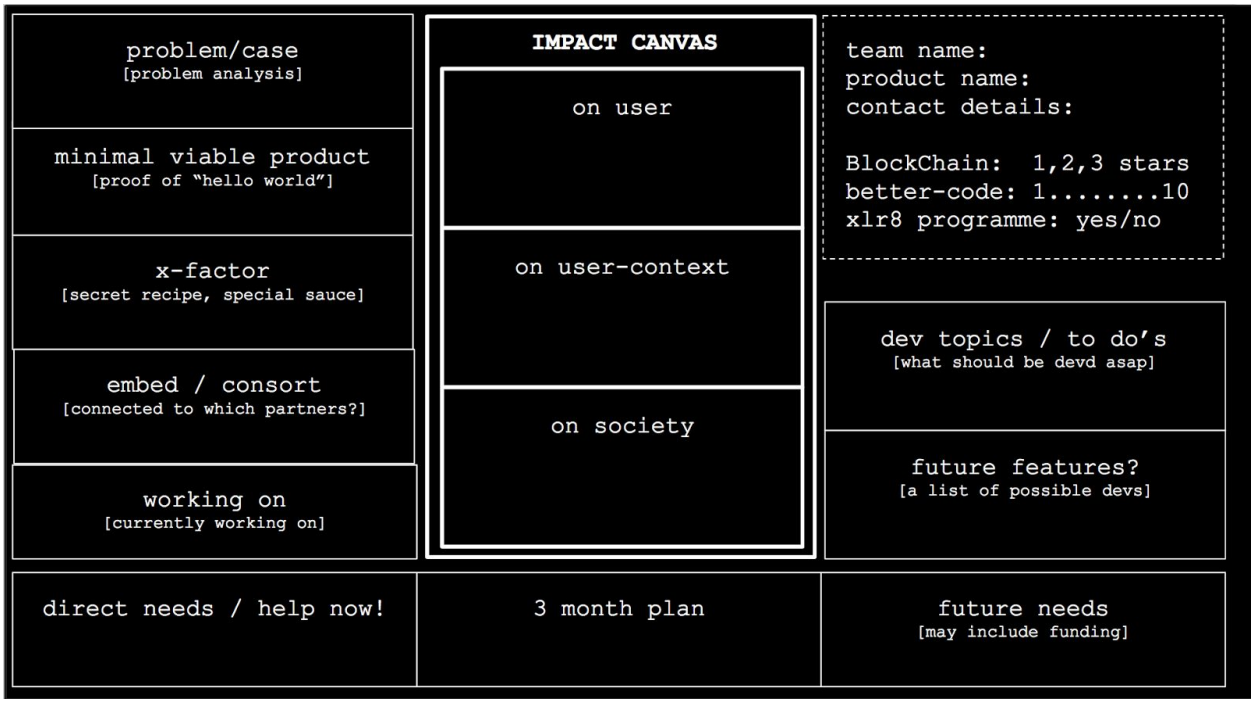
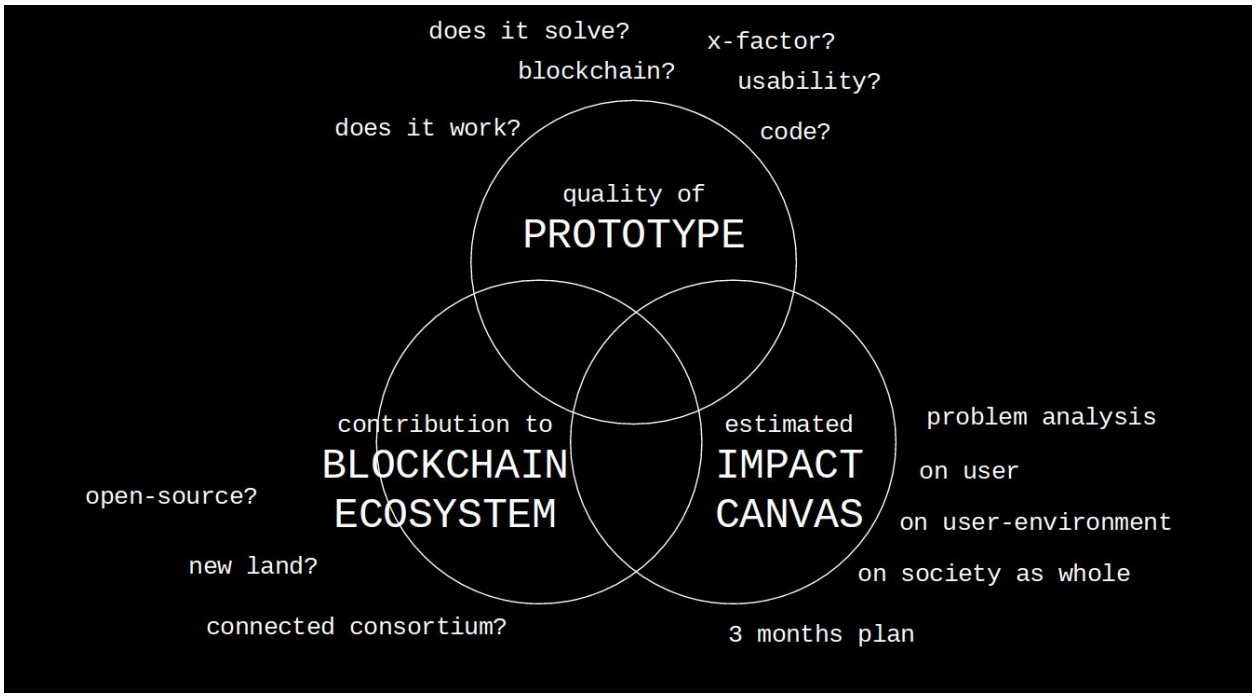
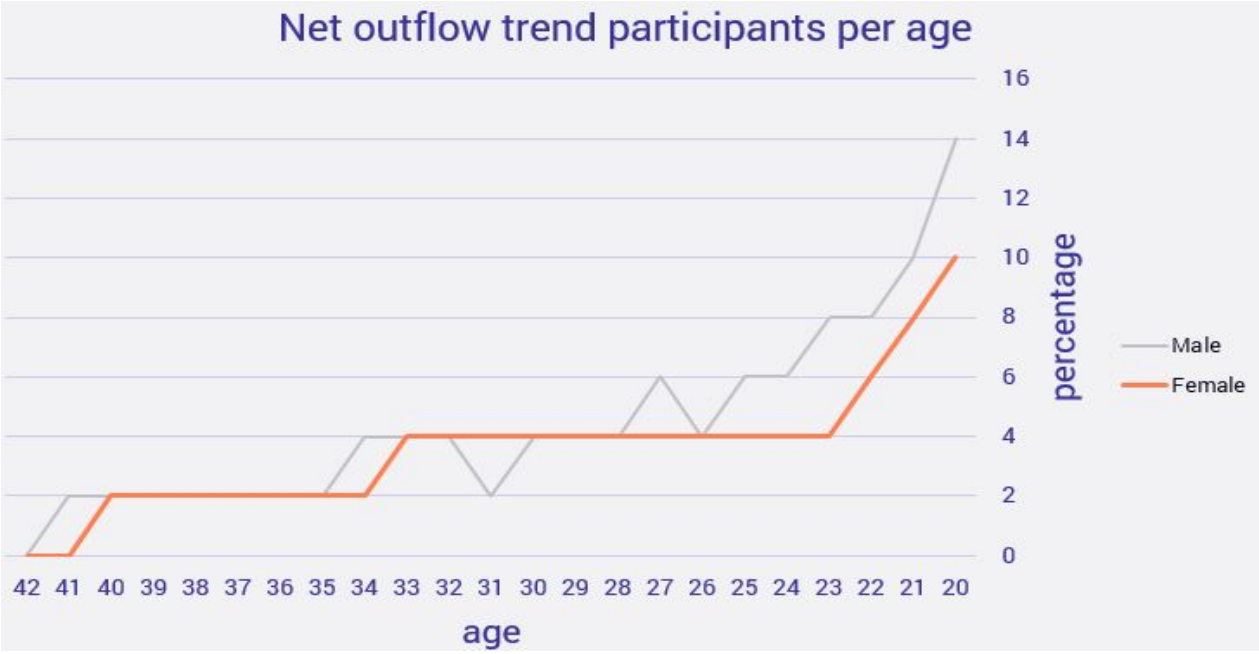
Impact Canvas NestEgg

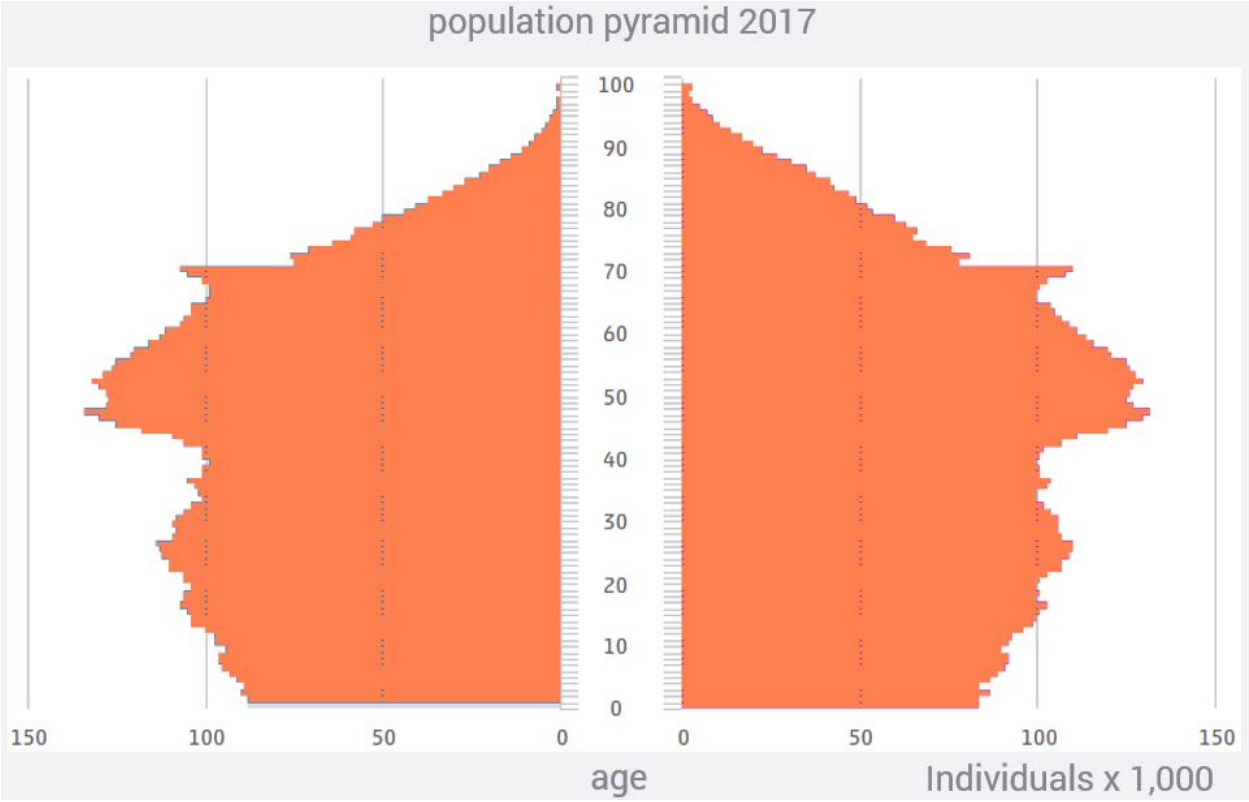




Problem/Case

- Pensions are in need of updating to prepare against a trend of **decreasing ratio of working people/retirees** because of the **aging population**, and to accommodate an increasing trend of independents (startups, freelancers, etc) that don't build a "second pillar" of funds through a large employer.
- For the last two years, the **coverage ratio has been below 100%**
- There is **not high confidence in pension funds**, making people wary of investing in them, further exacerbating the issue.
- Independents (currently) often rely on AOW and their own savings to prepare for retirement. Existing pension plans **have difficulty offering accessible plans to incorporate independents** or their lifestyle (uncertain of the next few years, uncertain of upcoming cash-flows (without stable income), etc)
- **Decentralize decision making:** In addition, for those building the second pillar, there is no information as to the specific investments made on behalf of the individual's investments. Users receive reports of the aggregated investments and risk portfolio made by the company, yet have no input or user-specific data to make better decisions with.
- The **third pillar 'own savings' is currently decoupled from pension companies** and individuals store their savings themselves in stocks, bank accounts or at home.




population pyramid 2017
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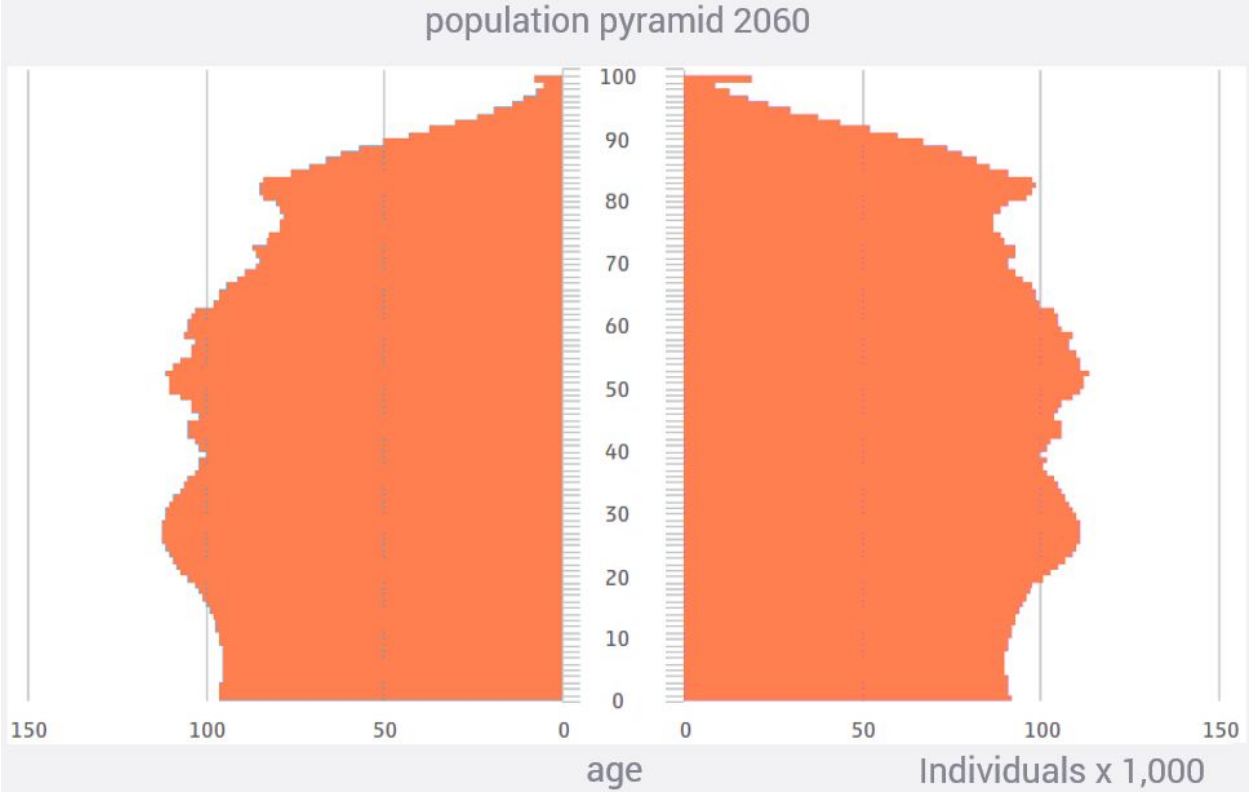
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Individuals x 1,000

These problems display that current pensions are unstainable and are in need of updating to account for the changing demographic and financial conditions.

Minimal Viable Product

Solution in theory

We aim to simplify legacy pension infrastructure with a blockchain infrastructure called Factom, to create an auditable trail of every individual's pension. This transparency and auditability upgrades current pension infrastructure, decreases overhead for managing accounts, eliminates the need for fraud departments, and allows user-profiles to be easily transferred between companies without data loss or data corruption. Upgraded and more lean and efficient pension infrastructure then opens up the ability to incorporate future diversified income streams (crowdfunding community projects, investing in future services, etc). This allows for the pension company to offer services to independents or existing users to diversify their 2nd and foremost the 3rd pillar, which is currently not included in the pension portfolio of the company APG.

More than that, we want to offer an opportunity to the customer to invest their savings into the 3rd pillar, which would consist of investment projects in which they can decide what to invest in themselves. This gives the user agency to choose where their pension investment goes and stimulates the relationship between customer and pension provider. Also, their savings would normally have to be stored in the bank on which they have to pay taxes. This system aims to gain back trust from users by giving people the opportunity to invest their money into projects they support with the ability to check the amount paid out when they retire. Also, this pillar should be aimed at independent workers and the part of people's income that raises above 100k which normally people would get added on top of their income instead of transferring 20% of that to the pension provider.

Solution in practice

We use factom chains to control assets. Assets will be tokens. The idea is each chain will be it's own assets with own tokens. The pension company would control the chain. Each person has a chain and the pension company will record all interactions with that pension via the blockchain and move the tokens accordingly. This gives them a solid immutable audit trail. Our transactions would also include hashes and locations of human-proof documents (checks/forms/etc).

We are allowing tokens on a chain to be moved to other chains. This allows someone, when they switch employer/pension company, to move their accumulated pension to a new fund (currently it often stays at the pension company you are assigned and you recieve the years you worked for them times the rate 1.875% back when you retire). Also, if you allow tokens on a chain to be moved to another, it allows someone to inherit a pension if their

spouse passes away or if a kid becomes an orphan (both chains get combined because the tokens although on different chains, have the same value). And we keep the other chain's history as all data in Factom is permanent and immutable.

It also allows a pension company to be bought. If they are bought they move all the pensions in the blockchain to the new holder. And if the new company doesn't want to do blockchain, they simply move their chains to non-existent chains to show the sale for audit reasons.

Because this is an immutable audit trail, it can be easily implemented as an additional layer to the existing pension software that can be integrated via API calls. But if they have to review history or audit something, they will have a timeline that can span company sales, can span inheritance, and all other interactions in 1 spot. No information that is private needs to be shared, but we can include location of files, so when they go through the history, they can use their existing audit methods and use the Factom chain to prove the negative (prove no missing files). This means that if a person 25 years later claims they added money to their pension which they didn't the pension company can prove this is not true. If the document does not exist in Factom (and it is integrated properly), then they can prove they have all the documents and there is a fixed number of them.

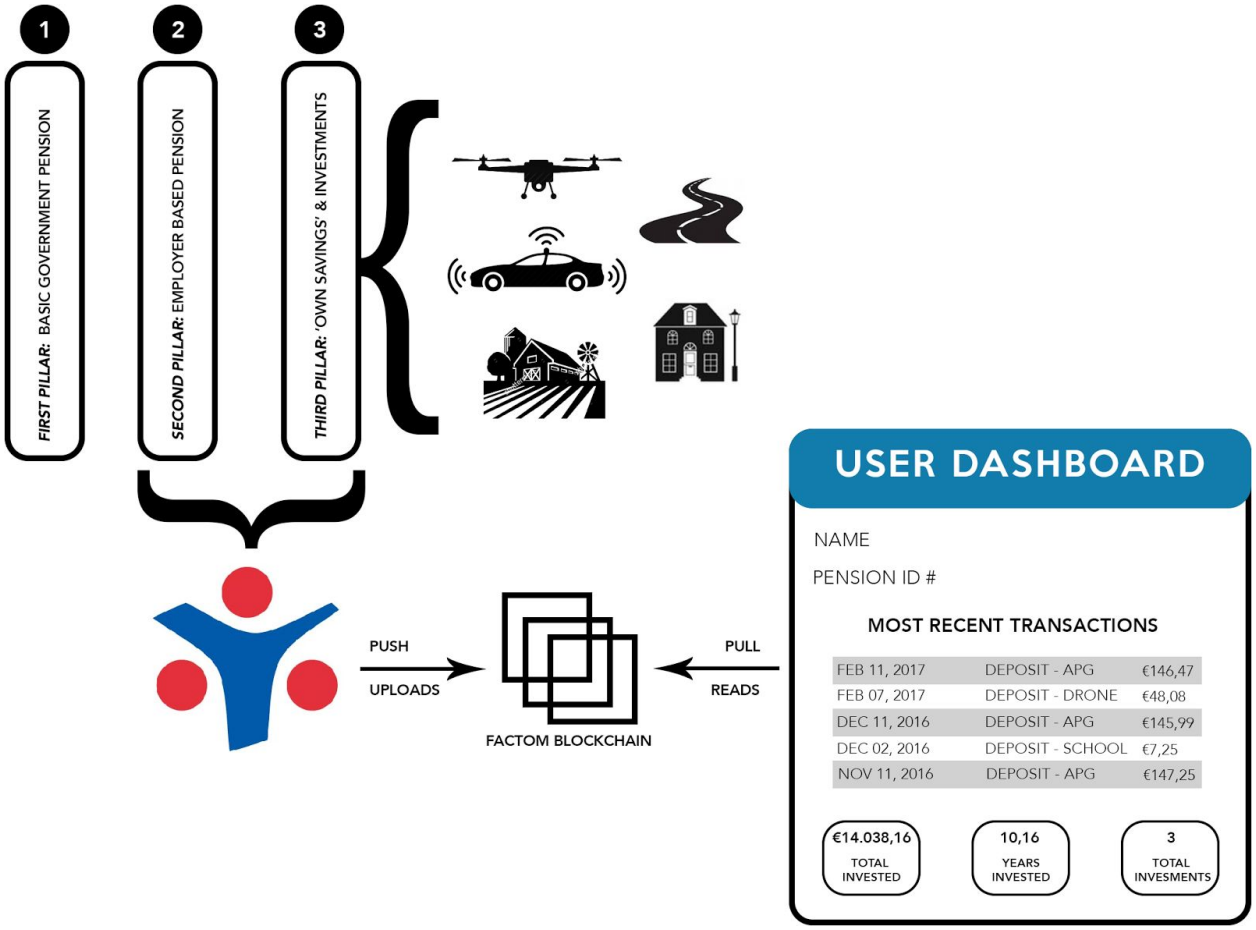
What does this add for the customer?
A frontend that monitors all the assets in a dashboard and lets the customer check real-time what value their pension is worth and what projects their money is invested in.

What does this add for the pension provider?
Using Factom to manage pensions, it costs $.001 to make an entry. This fee value is pegged by a constantly updating factoid/entry credit conversion, based off factoid's market price. This ensures the fee will always be around $.001 *($^{1}/_{10}$ of a USD Penny).*

So to keep audit records of pensions in which you *(for example)* make 5 entries a month per pension, the calculation for 1 pension is 5*12*.001= 0.06 per person per year. More outcomes of possible situations are displayed below.

# of Pensions	# of Entries a year	Cost/Person/Year
100	12	1,20$
100	50	5,00$
10.000	12	120,00$

10.000	50	500,00$



Secret Sauce - Factom

Data entries are secured by the most secure blockchain, Bitcoin*. Bitcoin allows for script which process stack-based, left-to-right, non-looping commands within space left over in bitcoin transaction data, called OPCODE. Factom acts as a layer on-top of bitcoin: allowing the storage of .JSON files, documents, and other data too large to fit inside bitcoin's OPCODE.
**Note: Factom can use any blockchain, so even if bitcoin dies the data can be attached to ethereum, monero, etc.*
Companies don't need to know blockchain to use NestEgg. We use factom which abstracts the blockchain so companies don't have to use cryptocurrency to use its benefits. Factoids are exchangeable tokens on the Factom ledger that can be converted into entry credits, which can only be used to make immutable data entries to Factom. Because entry credits are not exchangeable, it acts a "license" to make an entry, which cannot be traded/hacked, freeing the pension company from the responsibility of securing a factom-wallet.

Embed/Partners

- APG/PGGM
- Factom
- Crowdfunding initiatives
- Companies wishing to raise capital for large companies that can payout long-term dividends on the investment OR provide a comparable service at a later date.

Impact Canvas

- On user
    - Individuals have the data/information about their individual pension investments, renewing confidence in pension funds. Additionally, users now have the ability to mathematically prove every payment into their pension and what they are entitled back. Plus, if employees change companies, they can choose to move their tokens to a new company. This makes it easier to interact real-time and always be able to check the value of their pension.
    - Independents are included in the system by creating opportunities to invest your 3rd pillar ('own savings') in specific investments/portfolios/crowdfunds/future services. Thus, even if an individual isn't covered by a company with a large pension plan, they have options to invest in their future beyond their bank account and stocks.

- On user-context
    - Pension funds, companies seeking long-term investment
- On society
    - As the economy transitions to a hyper-competitive service economy (vs manufacturing), giving individuals the agency to check at any time how much pension they have and what is invested in. Also, the ability to move tokens between different chains when for example a spouse passes away, gives the partner a more secure feeling in terms of receiving their pension in the future. Adding the feature to invest your savings into investment projects too, individuals in society will feel more taken into the process and this will increase the trust in pension systems, regardless of their career path (independent or corporate).