Smart Contract Powered Retirement Plans

WHITEPAPER

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Abstract

Across the globe, individuals and governments face the reality that people are not saving enough to meet their retirement needs. We are living longer, and the implications of longevity are broader and more urgent than many of us are willing to acknowledge. Globally, life expectancy has grown by nearly 50% since 1950 and 30% since 1980 alone[1]. These changes are occurring at a time when the need for financial advice has never been greater, as savers grapple with global and geopolitical uncertainty, prolonged low and negative interest rates, and longer lifespans.

Retirement savers are often left out of decision making. They are inadequately addressed and feel disenfranchised. In addition, they are not offered the transparency needed to be well informed and are treated in a paternalistic manner.

Furthermore, client preferences have changed. A recent Accenture study[2] found that clients increasingly prefer to have a mix of robo and human advisory. In addition, they feel more and more comfortable to tailor their own portfolios.

However, for many investors, creating a retirement portfolio can seem like an overwhelming task. In recent years, dedicated, but local retirement plan services like Betterment and Wealthfront or Nutmeg have addressed this need for tailored, transparent and robo-advisory driven retirement portfolios.

At Auctus we believe we can even go a step further, cutting out all middlemen by utilizing blockchain and smart contracts, as well as allowing retirement savers to aggregate their entire retirement savings, from regulated 401k/IRA plans, voluntary traditional investments as well as cryptocurrency investments. This holistic approach allows to run analytics and robo-advisory on the entirety of savings, enabling the retirement saver to take better decisions and ultimately reach their saving targets faster.

[1] United Nations, World Population Ageing Report, 2015
[2] Accenture Consulting, The New Face of Wealth Management - In the Era of Hybrid Advice, 2017

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1 – Vision

Auctus' mission is to put retirement savers back in control of their retirement plan, by offering access to a global investment platform that allows users to create optimized portfolios of bonds, stocks and cryptocurrencies, by providing the information needed to take well informed decisions, by using blockchain to increase transparency and automation, and ultimately increasing trust towards the chosen retirement plan.

Robo advisory, transparency, automation and record keeping are thereby an integral aspect of the Auctus Platform, as well as a marketplace that allows the retirement community to come together without middlemen.

Auctus' vision is to create a platform from the community, for the community and aspires to be as decentralized a possible and as much community driven, owned and managed as feasible.

2 - Value Proposition

Decision Power

Traditional retirement plans are rigid, leave very little room for decisions and keep their customers in the dark about performance and fees.

Auctus' ambition is to provide data transparency, fee transparency as well as validation of advice. The Auctus Platform was designed to give the users the information needed, take well informed decisions and ultimately be in control of their retirement savings.

Holistic Approach

Instead of having a regulated retirement plan (such as a 401k/IRA), some investment platform for equities and bonds and some wallets with cryptocurrencies, users will be able to consolidate all of their different retirement savings in the Auctus Platform, having full overview and control.

It will be possible to upload the asset allocation of your regulated 401k/IRA plan, traditional voluntary investments and combine it with your cryptocurrency investments.

This holistic approach allows the user to focus on the overall risk/return characteristics instead of analyzing them individually. This offers unparalleled diversification opportunities, thanks to the low correlation between fiat and crypto assets.

Only a holistic approach will allow retirement savers to obtain the necessary information to run holistic portfolio analytics and determine the suitable investment strategy to reach their retirement saving goals faster.

Long-term focus

In comparison to other investment services, Auctus is specialized on retirement saving. This means the platform is set up with the purpose of long-term saving and payout. Our analytic tools go beyond classic risk calculations and allow you to model your savings from contribution amount, time period as well as payout amount.

Removal of cost layers

The Auctus Platform is turning the retirement plan model upside down. Instead of having multiple cost layers from expensive fund structures, portfolio managers and further middlemen, we are replacing everything with analytic tools and robo advisory. If desired, human advisory can be purchased at the best global market rate.

Transparency

Transparency is a buzzword in the blockchain space. However, transparency is more than a buzzword in the case of Auctus. The retirement plan industry is one of the few industries which hasn't been disrupted. Information is often kept hidden and customers aren't being informed properly.

Offering complete transparency is therefore key, no matter when it comes to investments, or operating the Auctus platform itself.

Result oriented fee structure

Our robo-advisors and human advisors have a result-oriented fee structure to incentivize good advice. Users won’t have to pay for mediocre advice.

3 - Market Overview

3.1 - Market Size

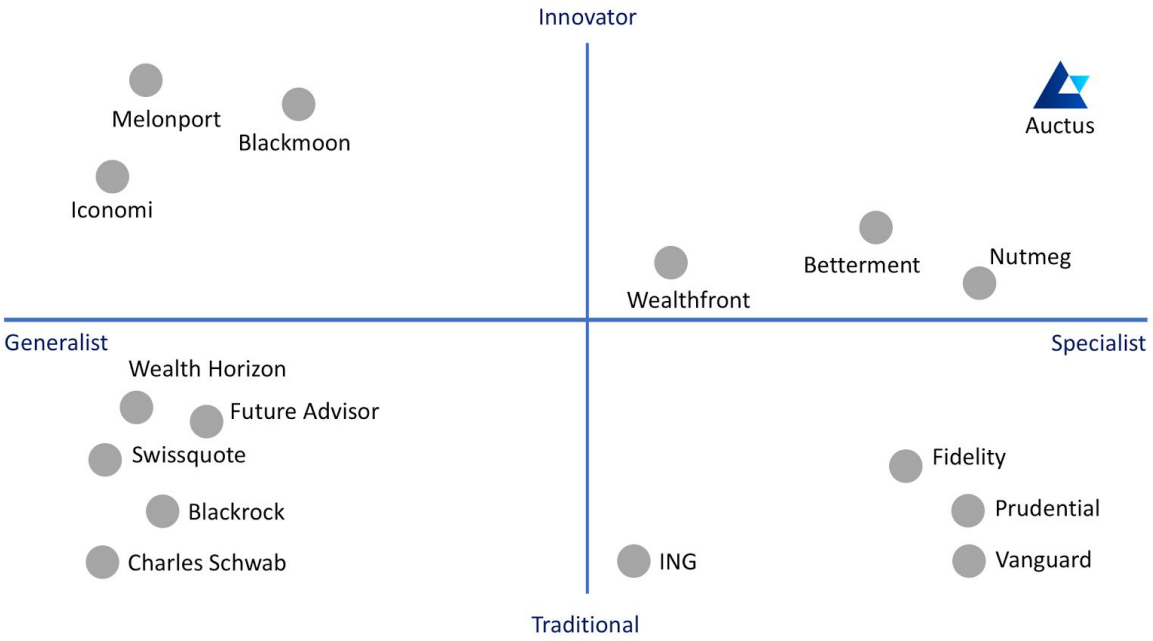
Worldwide, total retirement plan assets were estimated at USD 36 trillion at the end of 2016. The US accounts for 62% of global pensions assets, followed by the UK (7.9%) and Japan (7.7%)[3]. Total United States retirement plan assets in 2016 were USD 19.1 trillion, of which roughly 35% was defined contribution and 65% defined benefit plans[4].

3.2 - Competition

In recent years, dynamic investment platforms, as well as specialized retirement plan platforms have experienced strong growth as they fill the desire of customers for low fees and tailored solutions that can be assembled by the user.

We believe that Auctus is positioned in a unique way, bridging between the cryptocurrency space and specialized retirement saving platforms, while integrating the latest robo-advisory and analytic features.

To compare Auctus' positioning in the existing ecosystem, we plotted some of the most notable companies on two axes, as shown in the chart in Figure 1 below.



The vertical axis ranks the impact on the industry in terms of innovation, the horizontal axis ranks projects and companies from generalist to specialist. With specialist, we mean retirement plan and goal-based investment focus, with tailored analytics and advice for retirement savers.

[3] Towers Watson - Global Pension Assets Study, 2017
[4] Federal Reserve - Statistical Release Report, 2017

Cryptocurrency Generalists

Whereas Iconomi is an innovator in terms of being the first cryptocurrency based investment platform, it is a centralized solution. Melonport and Blackmoon have blockchain based, decentralized business models and follow a generalist approach, meaning they aren't offering dedicated retirement and goal-based investment tools.

Centralized Specialists

Wealthfront, Betterment and Nutmeg are innovators in the retirement space. They all offer tailored platforms for retirement savers, have innovative robo-advisory and analytic tools. However, they are all local (Wealthfront and Betterment US only and Nutmeg UK only), they also are centralized platforms, without involvement of the community. The tools are static and cannot be extended or amended by the users.

Traditional Specialists

Companies like Fidelity, Prudential or Vanguard have long standing reputations in the retirement asset management space. They offer large scale solutions. Even though some of them show interest for new technologies, they are usually late adopters in terms of technology and won't be taking any risks for the sake of innovation.

Traditional Generalists

Many banks and investment managers have established online investment tools. Usually there is little innovation with these players. They focus more on proven strategies, business models and technology.

Auctus is positioned as an innovative, decentralized and cryptocurrency specialist, focusing on the retirement plan and goal-based investment industry, by utilizing the decentralized nature of the Ethereum network, enabling to be community driven, owned and potentially even managed and by providing the latest robo advisory and analytic tools to empower users of the platform.

4 - Issues

4.1 - Challenging Market Environment

Since the financial crisis, the need for financial advice has increased, as existing challenges are gaining in magnitude and are supplemented with new ones. Volatile markets, record low yields, aging populations and lack of financial literacy, or access to advice are jeopardizing the future retirement income of individuals. Incidents that could be absorbed in the pre-financial crisis environment are now impacting retirement plans more severely and are thus exposed more frequently.

Record Low Yields

Investors usually crave low interest rates, because cheap borrowing costs encourage spending and capital investments, which fuel economic activity and growth. Low rates also offer relief for debt-laden governments and consumers, who can now refinance existing loans at better terms.

However, for retirement plans, low interest rates mean low yields on bonds. Low bond yields make it harder for retirement plans to secure future income for their members, given that reserves required to fund future liabilities increase when bond yields decrease. Many retirement plans have found themselves underfunded because of low bond yields, forcing on them a hard choice between insolvency and taking on uncharacteristically high investment risks to escape it.

Low interest rates also lead to higher valuations on equities, which are a major component of retirement plans' portfolios. With stocks more expensive, expected future returns are lower, making the problem of meeting pension promises even more severe.

Aging Population

A demographic crisis for retirement plans, driven by longer life expectancies and declining birth rates, has now become critical, thanks to historic low bond yields across the world. The result is enormous deficits. In the US, retirement plans run by companies in the S&P 1500 index were underfunded by $562bn by the end of last month, according to Mercer — nearly $160bn more than just seven months earlier thanks to further drops in bond yields. For US public plans — which are allowed to assume far higher interest rates than are available in the bond market, making their liabilities look unrealistically cheap — the problem is far worse.

4.2 - Outdated Business Models

Changing Lifestyles

Providers of retirement solutions often have a long history and heritage. Although experience is important, there is often a lack of innovation and flexibility of adapting to new

circumstances. Lifestyles have changed over the past decades, employees are changing their employer more frequently and might even change their domicile and jurisdiction over their career. Current retirement systems are not set up for this kind of profile, despite it becoming a standard.

Lack of Engagement

At a time when the need for financial advice is so great for so many, levels of engagement with financial advisors are disappointingly low. Approximately 17% of individuals surveyed in both the UK and Germany and 14% of individuals in the Netherlands currently use the services of an advisor. In the US, only 28% of individuals surveyed use a professional financial advisor. Further, more than one-quarter of those surveyed who previously used advice had stopped taking advice because it had become too expensive. Disengagement with advisors is especially prevalent in jurisdictions where regulators have prohibited commissions from financial product suppliers (e.g., mutual fund managers) to financial intermediaries as they seek to mitigate potential conflicts of interest. This lack of consumer engagement is compounded by low levels of financial literacy, which may negatively reinforce individuals' willingness to engage with financial advisors[5].

Inadequate Communication

Many providers of retirement plans treat their members in a paternalistic way. Members get only occasional updates, without proper engagement, nor the necessary transparency. Furthermore, members feel as if they are not in control of their retirement saving. Ultimately, this is leading to a completely disenfranchised customer base that is only loyal due to lack of alternatives.

4.3 - Existing investment platform issues

Mediocre advice

Without a proven track record of previous advice and a fee structure that allows users to pay for advice only when the returns are satisfactory, investors might end up paying for bad advice that will result in retirement income gaps and ultimately by not achieving their saving target.

Hidden Costs

Most retirement plan members are not aware of all costs involved. Asset management fees represent only part of overall costs. There are many other costs involved; minimizing these costs can lead to a transparency problem as described by Gail Moss and the IPE[6]. Retirement costs are comprised of transaction, trading and asset custody fees, but also include regulation, administration and reporting costs. These costs are often hidden. Hidden costs reduce net investment returns and can significantly lower funds accumulated for retirement income.

[5] Accenture, Financial Times and time.com
[6] Gail Moss, Investment and Pension Europe Magazine, 2017

5 - Why Smart Contracts & Blockchain

Many of the issues affecting the retirement plan industry can be solved by business model reengineering, others by adding robo-advisory and analytic tools and lastly others by applying smart contracts and blockchain technology.

At Auctus we are utilizing the Ethereum network in various areas with the following purposes:

Smart Contract Powered Fee Structure

Smart contracts make it possible to create a result-oriented, transparent and low fee structure. AUC Tokens stay in a trustless escrow and fees are paid only for periods that robo-advisor predictions are right. This system also brings fee transparency, allowing each investor to know exactly what they are paying.

Blockchain Robo and Human Advisor Tracking Record

Blockchain's inherently immutable record-keeping system brings the possibility to provide a permanent track record of all suggested portfolio allocations and robo-advisor predictions. So it is possible to explore robo-advisor performance by comparing expected vs actual returns and against our competitors.

Allowing to be community driven

The Auctus Platform is a community driven platform. This means that eventually, anybody around the world will be able to create or purchase tools and advice without any middlemen in between. Ultimately, our goal is to make the entire platform community driven. The characteristics of the Ethereum network, along with smart contracts allow us to be truly decentralized and will ultimately empower retirement savers.

Being truly global

We believe that there are significant advantages of having a global community. Not only will the community be larger and thus more powerful in size, but it will enable to take the best ideas and products from around the world. Since the Auctus platform will be community driven and decentralized, it will remain dynamic and adjust to local customs, laws or preferences. For example, what might be popular in Germany, might not be popular in Indonesia. On the other hand, there might be a user from China interested in a service from the US.

Enabling a decentralized market place

Part of the Auctus Platform is a marketplace for retirement apps. Apps that help users to customize their retirement management dashboard, to analyze data, as well as robo-advisory apps. Instead of having someone managing the marketplace, we'll have it

organized as a decentralized marketplace with smart contracts and automated payments according to smart contract terms.

Fee transparency

Needless to say that blockchain allows to increase transparency. Since fee transparency is a common issue in the retirement plan industry, the Auctus Platform will be offering full fee transparency.

Payment Gateway

The Ethereum network is allowing for an efficient and global payment network. This will simplify global standardization and allow for a truly global platform.

Trust

Trust is another issue of the retirement plan industry that Auctus will solve by utilizing the transparency, record keeping capability and immutability of the blockchain. Furthermore, by having a global community with various backgrounds and cultures, but a common and global marketplace, smart contracts that can be audited will increase trust into the platform and its processes.

Decentralization of ownership, decision making and operational processes

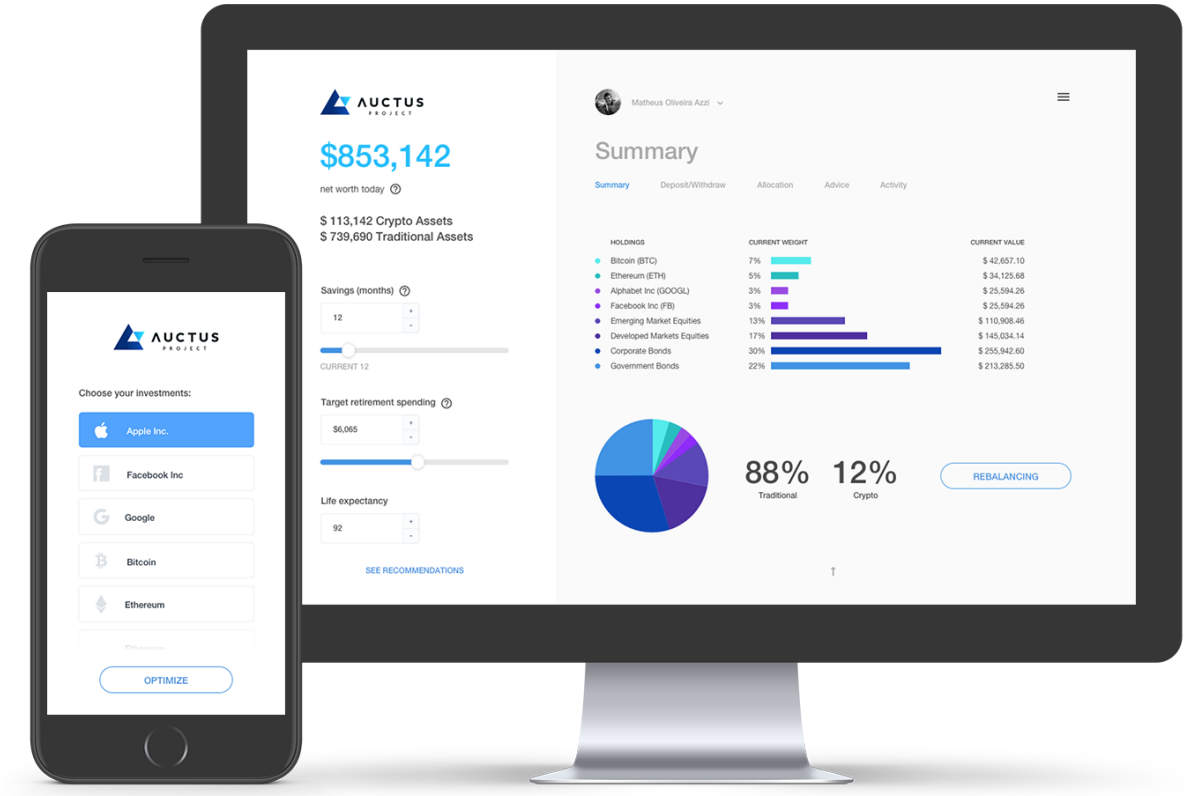
Not only do we intend to create the Auctus Platform in a decentralized way, but ultimately we aspire to even organize the operations from ownership, decision making and accounting of Auctus in a decentralized way. Auctus intends to use Aragon's platform (https://aragon.one/) to achieve this goal.

Tokenization of Assets

As tokenized digital versions of traditional assets become more available, it is becoming easier to manage traditional investments using the power of blockchain technology and smart contracts. It is faster, more secure, easier and less costly to trade and store tokens instead of actual assets, which is a further advantage of being a blockchain and smart contract driven project.

6 - The Auctus Platform

The Auctus Platform is a global smart contract-based retirement and goal-based saving platform with specialized portfolio management services for traditional equity and bond investments, as well as cryptocurrency investments.



Source: Auctus Platform

The platform provides the user an aggregated view of all retirement savings, from government regulated IRA/401k plans, voluntary traditional retirement plans, as well as crypto wallets. Only by having this holistic view, well informed decisions and a professional long-term strategy can be established.

In an initial phase (alpha version), all holdings will simply be uploaded virtually. Once all retirement savings have been uploaded to the platform, the user will be able to run analytics and robo advisory on the entirety of the retirement savings. At a later stage, it will also be possible to trade cryptocurrencies and tokenized assets straight from the Auctus Platform, enabling further features such as automated rebalancing between cryptocurrency and traditional holdings.

In addition, the Auctus Platform has a marketplace for retirement apps, which allows you to customize your user experience.

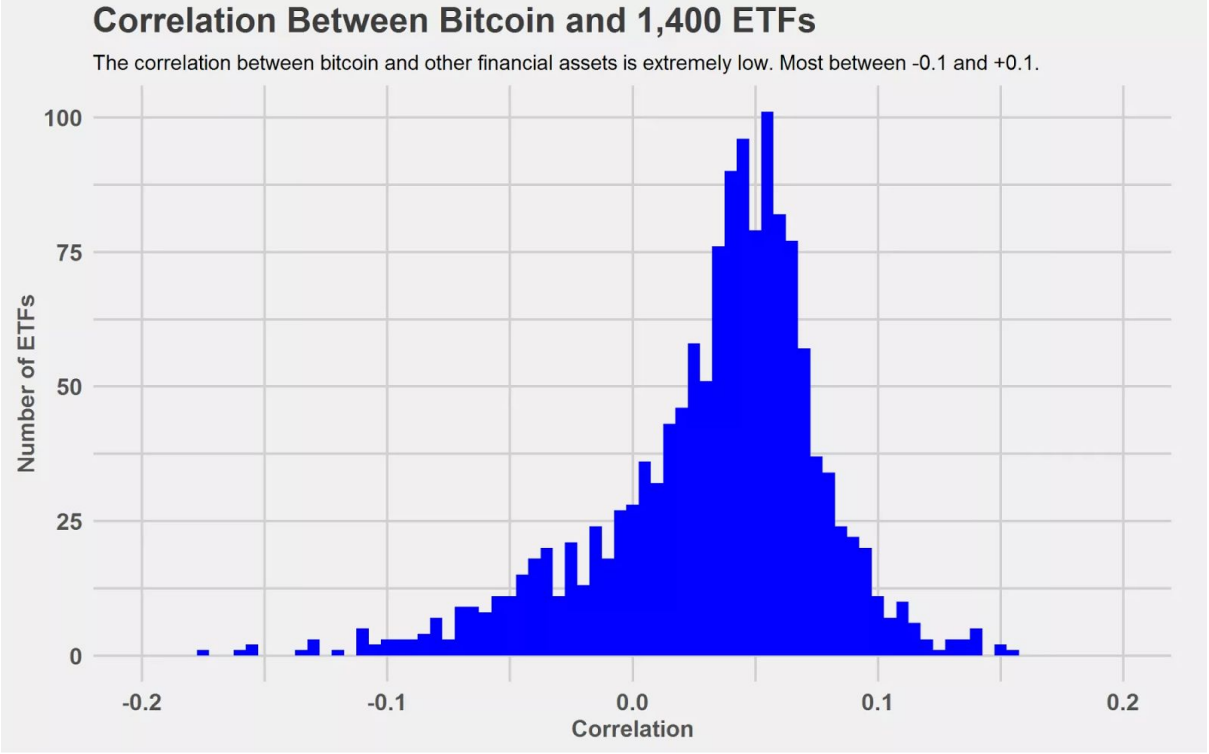
The Auctus Platform provides the following features:

- Allows a mix of traditional and cryptocurrencies investments
- Gives the user a holistic overview of all retirement savings
- Allows to run and consult analytics and robo-advisory on the entirety of retirement savings
- Enables users to make well informed decisions
- Is community run and can be tailored to individual needs with customized apps
- Provides transparency and trust

Traditional Assets and Cryptocurrencies

Having a mix of traditional and cryptocurrency assets has multiple advantages ranging from risk/return aspects to diversification.

A study run by Signal Plot calculated the correlation between 1400 ETFs vs. Bitcoin. The study calculated a correlation between bitcoin and other financial assets of -0.1 and +0.1, which is extremely low.

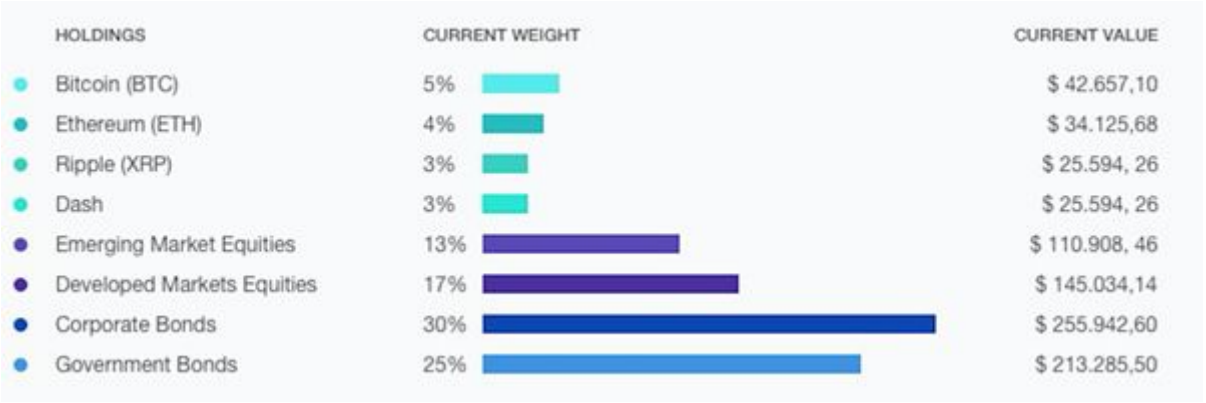


Source: Signal Plot

This is a strong argument for including bitcoin and other cryptocurrencies with similar correlations, as a significant part of a portfolio of risky assets. Finding and adding an uncorrelated asset to a portfolio can act as a powerful source of diversification by increasing

the portfolio's sharpe ratio. There are extremely few assets that are this uncorrelated with other assets and that makes bitcoin and other cryptocurrencies with these correlation characteristics extremely desirable from a portfolio construction perspective.

The Auctus Platform will be the first retirement focused investment platform which will enable users to construct portfolios consisting of traditional and cryptocurrency assets.



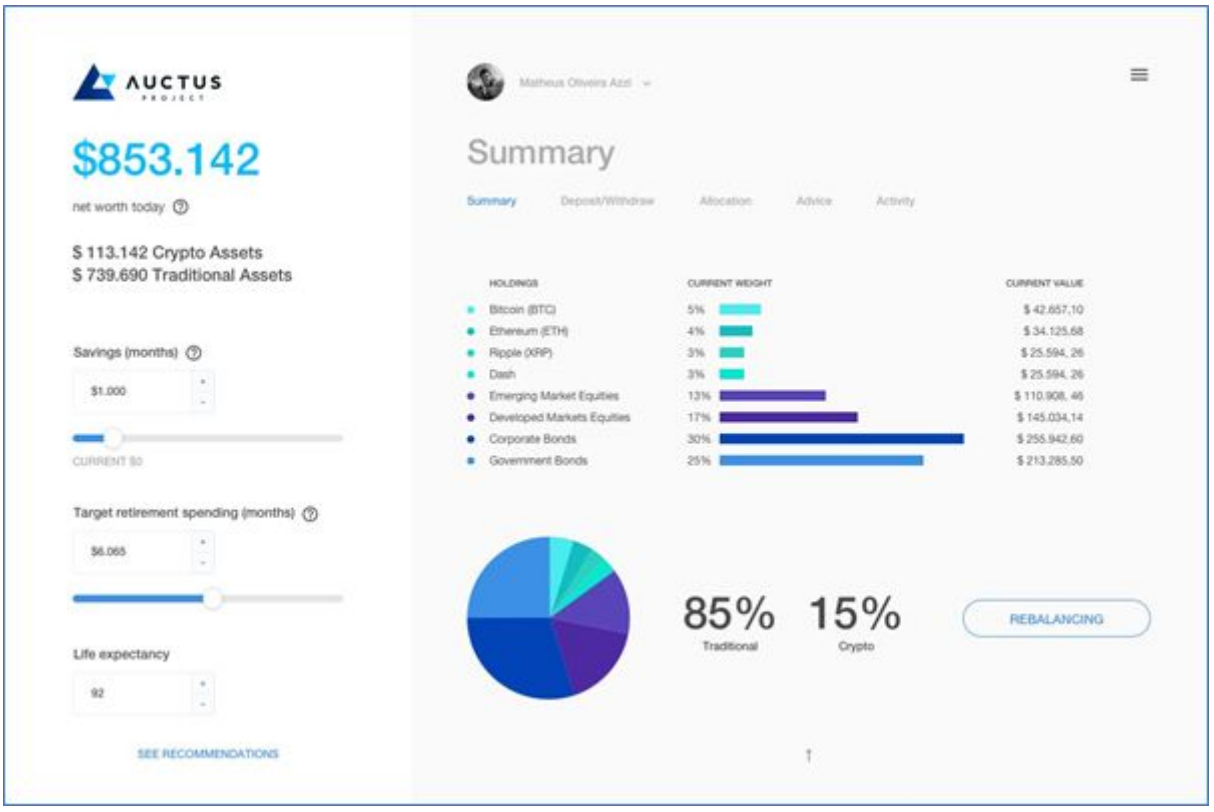
Source: Auctus Platform

Holistic Overview

Holistic portfolio construction is all about approaching your investments as all part of a whole, as opposed to viewing them as separate. The holistic strategy treats the portfolio as the sum of all its parts, connecting each investment in an overall web of risk and return.

Proper retirement or goal-based saving, requires this holistic view and needs to consider all factors. That's why the Auctus Platform will show users all of their holding in a straightforward and transparent user interface.

Even though this is a simple feature, traditional retirement saving often doesn't give this aggregate view, leaving the retirement saver with a multiple of portfolios and investment strategies that might be even conflicting and not properly optimized



Source: Auctus Platform

Users will have the possibility to virtually upload assets that are managed outside of the Auctus Platform, such as existing government pensions, IRA or 401k plans.

6.1 - Products

The Auctus Platform consist of two products that are accessed both via the same user interface. Analytics & Advisory, as well as Investment Services.

6.1.1 - Analytics & Advisory

Analytics & Advisory consists of services such as risk analysis, projections and risk/return metrics, as well as advice ranging from robo and human advisory services, as well as the apps and services marketplace.

Analytics

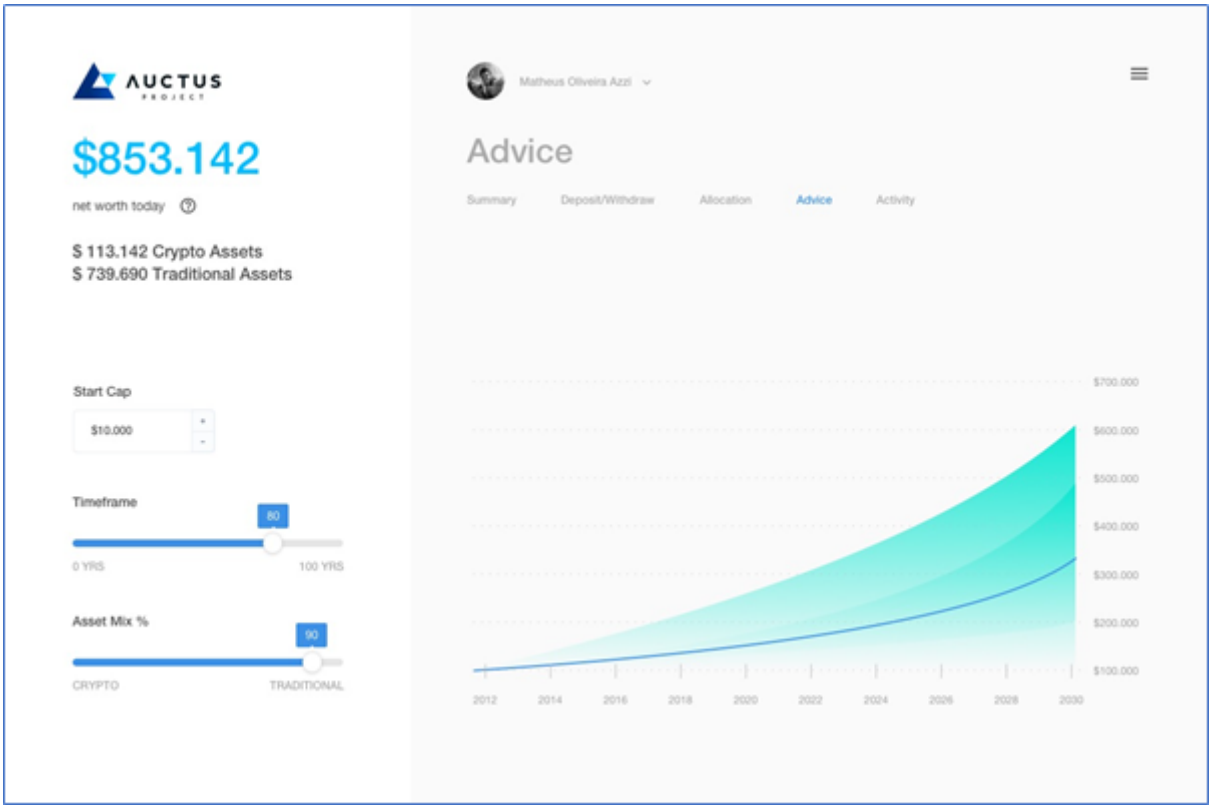
Once the user has added the totality of savings to the platform, a suitable portfolio strategy can be defined.

Users will get an array of tools to analyze their portfolios, including stress testing (scenario projections), risk metrics, portfolio optimization, crisis hedging, and actuarial analysis. These tools will help users to have a full understanding of their portfolios.

Projection tools will enable users to get an idea of what to expect based on their chosen asset allocation and timeframe. We believe this is especially important as nowadays

retirement savers are often left alone and have no idea what the long-term impact would be if they were to change the composition of their retirement portfolios.

See Appendix B for more information on the risk analytics mentioned above.

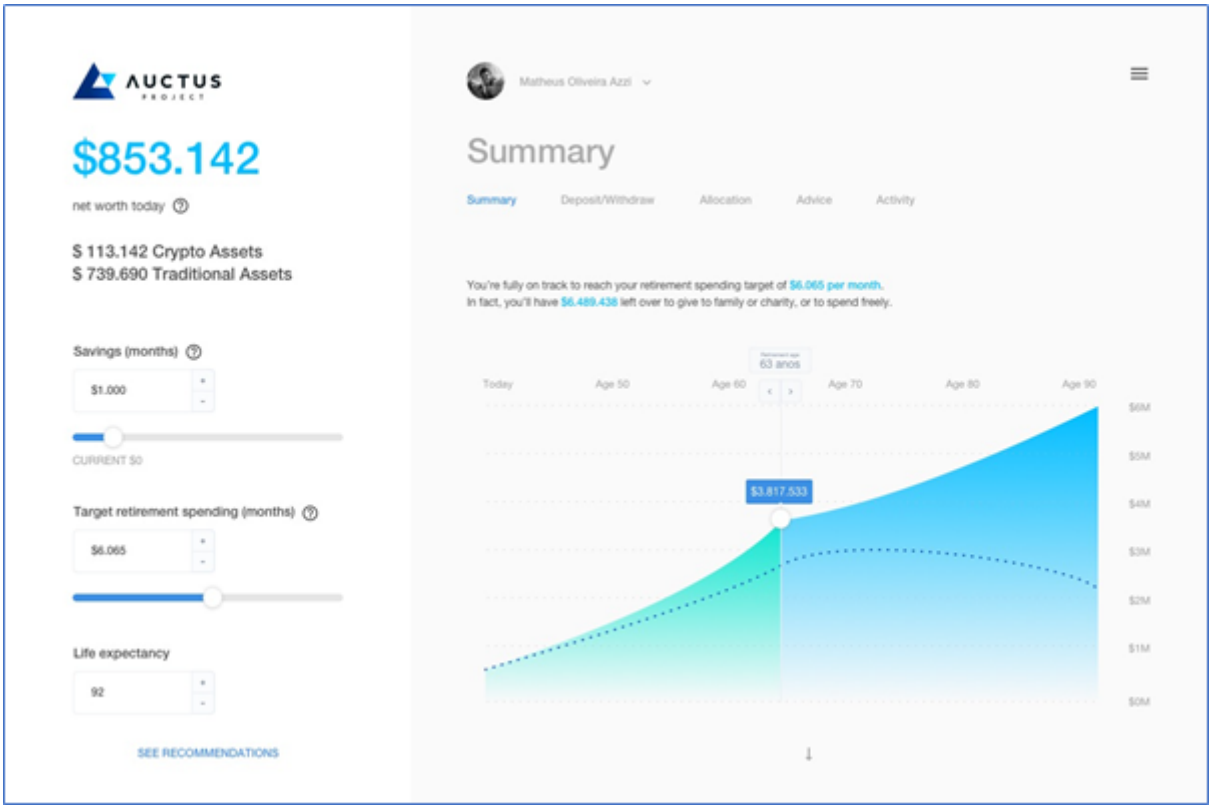


Source: Auctus Platform

Robo Advisors

A robo-advisor is an online, automated portfolio management service that follows a set of rules to choose appropriate investments based on the users risk tolerance and time horizon.

Robo advisors can automatically select investments and build a diversified portfolio. Once the users funds are invested, the software automatically makes changes to the investments to align the portfolio back to the chosen target allocation.



Source: Auctus Platform

The Auctus robo-advisor provides a variety of services, such as peer analysis and recommendations based on optimized risk adjusted asset allocations. Users can even give permission to the robo advisor to automatically make trades that follow a set of rules, such as tax optimization or diversification adjustments.

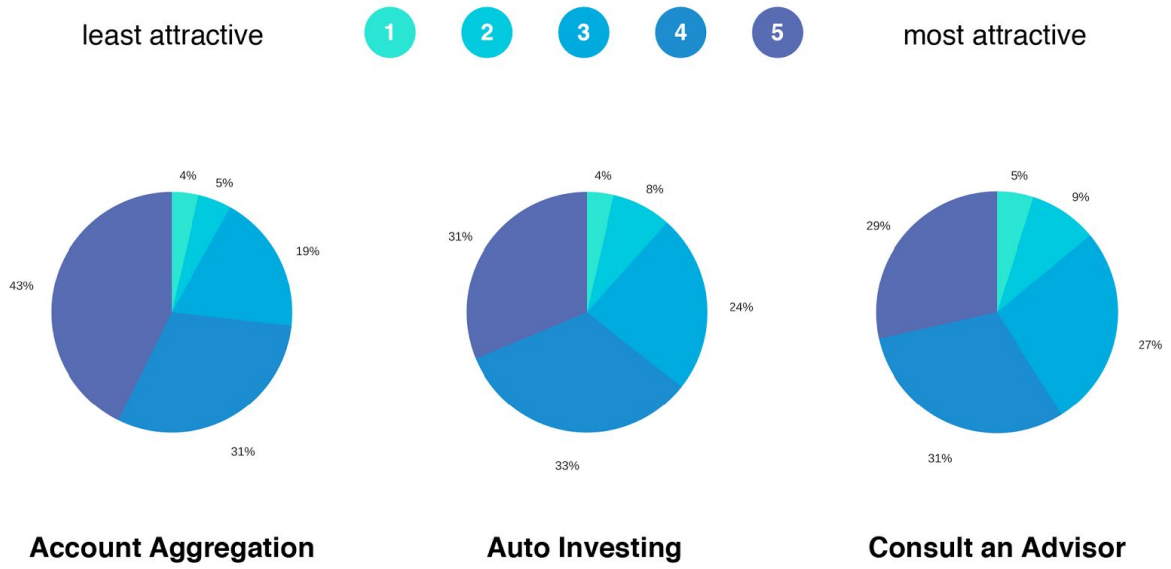
The user will be able to add further robo features via the Auctus Marketplace.

Human Advisors

Besides robo advisory, users will be able to consult human advisors whenever they feel a need for it.

KMPG recently did a survey on robo-advisors[7] to find out how the ideal way to offer such tools would be. Participants were asked to rank the attractiveness of different features and capabilities:

[7] KPMG - Robo advising, 2016



In the image above, the three most attractive features according to the survey are illustrated: the first one was account aggregation - followed by auto investing and the ability to consult a human advisor when necessary.

Account aggregation was rated with a 4 or 5 on the attractiveness scale by more than 73 percent of participants. Auctus will increase aggregation by treating crypto and traditional investments as one, allowing to run robo advisory and analytics on the combined portfolio (crypto/traditional).

Human advisory will also be provided via the Auctus Marketplace, allowing members to purchase services from human advisors by paying with AUC token.

Marketplace

The Auctus Platform will feature a marketplace with an app store and services store.

The services store will be a marketplace for human advisory. Advisors will be able to offer their services and earn AUC tokens in return. Retirement savers will have a transparent and cost-efficient way to get personalized advisory. Users will be able to rate advisors, thus further increasing transparency.

The retirement app store is a world novelty. The Auctus Platform will be an open platform. The community will be able to create widgets, add-ons and other features and either offer them for free or against an AUC token fee, either in the form of a small purchase price, or in a freemium model. Users will therefore be able to get the customized experience they desire.

6.1.2 - Investment Services

Investment Services consist of all trading activities of tokenized traditional and cryptocurrency assets, as well as related features.

Trading

By using the Ethereum network it is possible to create a global contribution gateway in which users are able to contribute to their voluntary retirement savings using ETH or any other tokenized currency.

The contributions will need to be converted into the assets that compose each user's portfolios. The Auctus platform will ultimately have a seamless exchange mechanism using the 0x open protocol (https://0xproject.com/) to trade between any kind of token on the Ethereum network.

A hybrid approach can be used in the initial phase, connecting to centralized exchange APIs until the decentralized approach achieves good liquidity.

Tokenization of Traditional Assets

Tokenization is the process of converting rights to an asset into a digital token on a blockchain. Currently there are several projects (such as LAToken, latoken.com) that are working on getting traditional assets tokenized.

Auctus aims to facilitate trading of traditional assets via tokenized assets. This has the advantage that all Auctus transactions could be tracked on the blockchain, it would facilitate 24/7 trading and would most certainly bring significant cost advantages.

Automated Portfolio Rebalancing

Automated rebalancing allows users to rebalance their portfolio in an automated way, based on a set of predefined rules. This can be rebalancing in terms of asset mix, for example in order to automatically convert cryptocurrencies to fiat investments if the cryptocurrency allocation surpases a certain percentage of total holdings, or rebalancing in terms of tax optimization.

The rebalancing timeframe, as well as the set of rules are variable and can be predefined by the user.

Automated rebalancing enables the user to maintain a conservative retirement plan, while keeping a healthy portion of upside in the overall portfolio, as well as taking tax considerations into account.

Recurring Funding

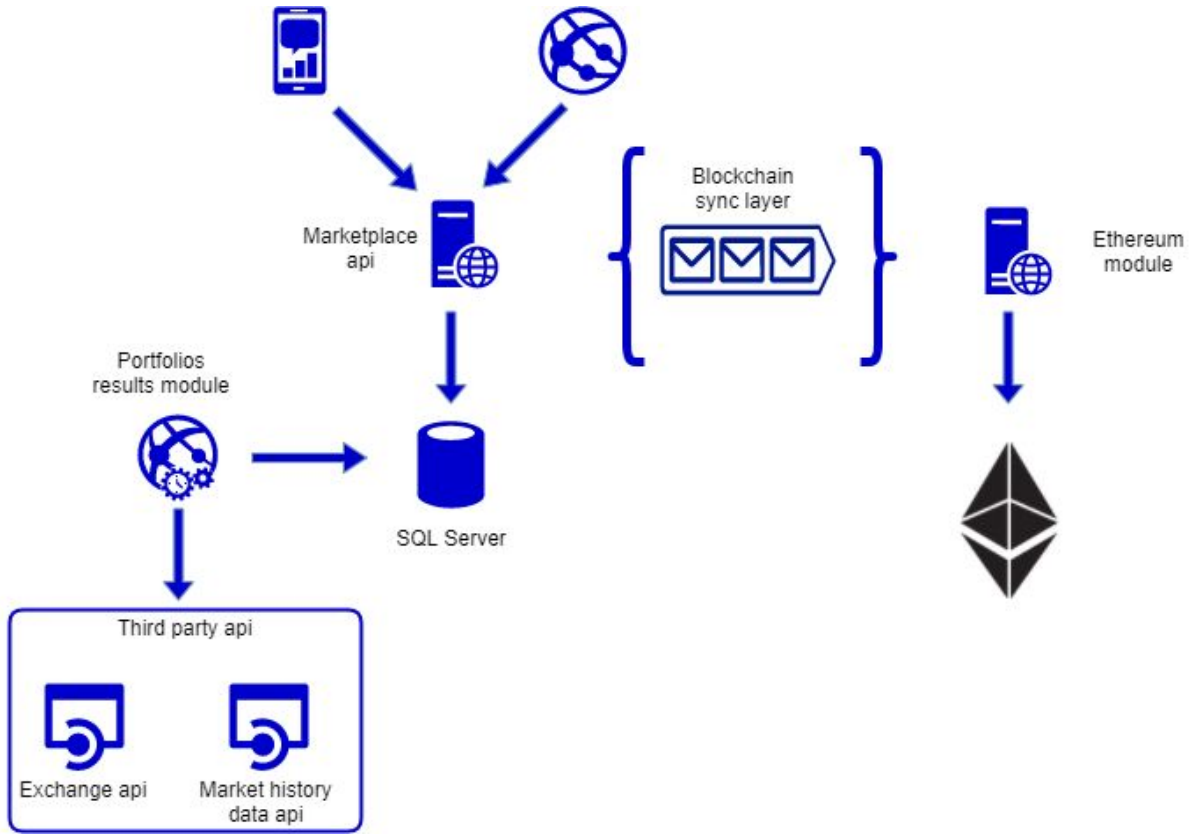
Pursuing a long term saving goal, such as retirement or any other major financial target requires thorough planning. Small changes can have major impacts in the long-run. A small

difference in return, or slightly smaller contributions towards the savings plan can lead to major differences in the long run.

To facilitate and smoothen regular funding, Auctus intends to add a feature to automate regular payments. For fiat contributions, this can be achieved via a bank wire gateway, for cryptocurrencies a payment request platform, such as Request Network (https://request.network) could be used.

7 - Technology

Auctus is combining various technologies on the Auctus Platform. The overall software architecture can be illustrated as follows:



Marketplace Frontend

We will have two frontend modules. A Web module, developed using the AngularJS framework, and a mobile app. Those modules contain only client-side rules and communicate with the Marketplace API.

Marketplace API

Backend module developed using the ASP.NET Core framework. This module provides the services for the mobile app and web application. It contains the rules for server operations related to the marketplace, such as portfolio creation and performance tracking.

Portfolio Results Module

To track historical performance of recommended portfolios, it is necessary to get information from outside the platform. The portfolio results module will get market information using third-party APIs: exchange API for cryptocurrency historical values and a market history API for traditional assets. The data collected in this module is stored on the same SQL Server

database used by the Marketplace API. This data is intended to be used for historical charts in the platform.

Blockchain Sync Layer

This layer is responsible for providing decoupling between web application and blockchain integration. By using queues in this layer it is possible to improve the user's experience, through asynchronous integration with the blockchain to improve the response time of the application. This approach makes the solution more scalable and tolerant to blockchain network instability.

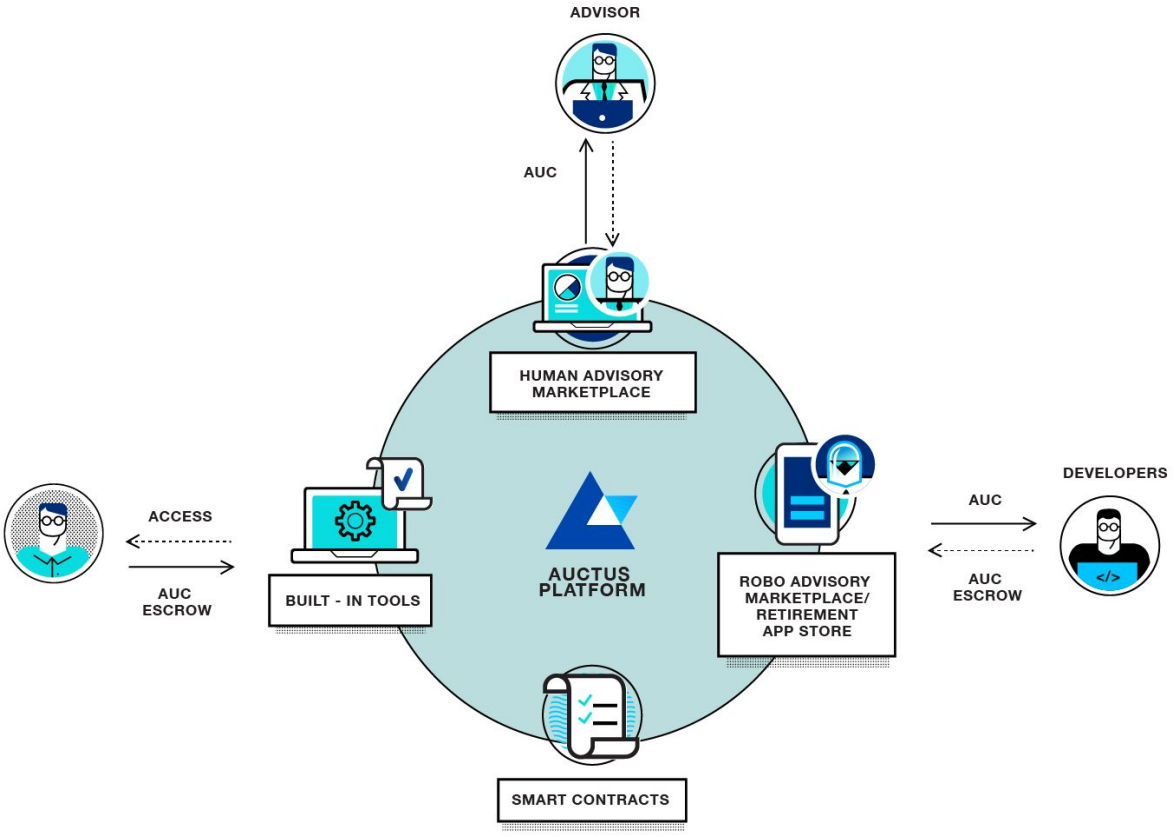
Ethereum Module

This module will be built using NodeJS and will integrate with web3.js. Some of the application information will be stored in smart contracts, developed using the Solidity programming language. Payments for advice will be made using smart contracts, as well as the portfolio projection values. A smart contract-based oracle, such as Oraclize (http://www.oraclize.it/) will be used to collect the real portfolio performance after a defined period of time. This information will define if the tokens locked for payment for the advice will either be transferred to the advisor (in case the advice was good, meaning that results met predictions) or redeemed by the customer (in case of bad advice).

8 - Token Model

To unite participants around the platform and assure the quality of third-party tools and services provided, a utility token was designed: the AUC token. The token fuels the platform and helps to create a balanced ecosystem.

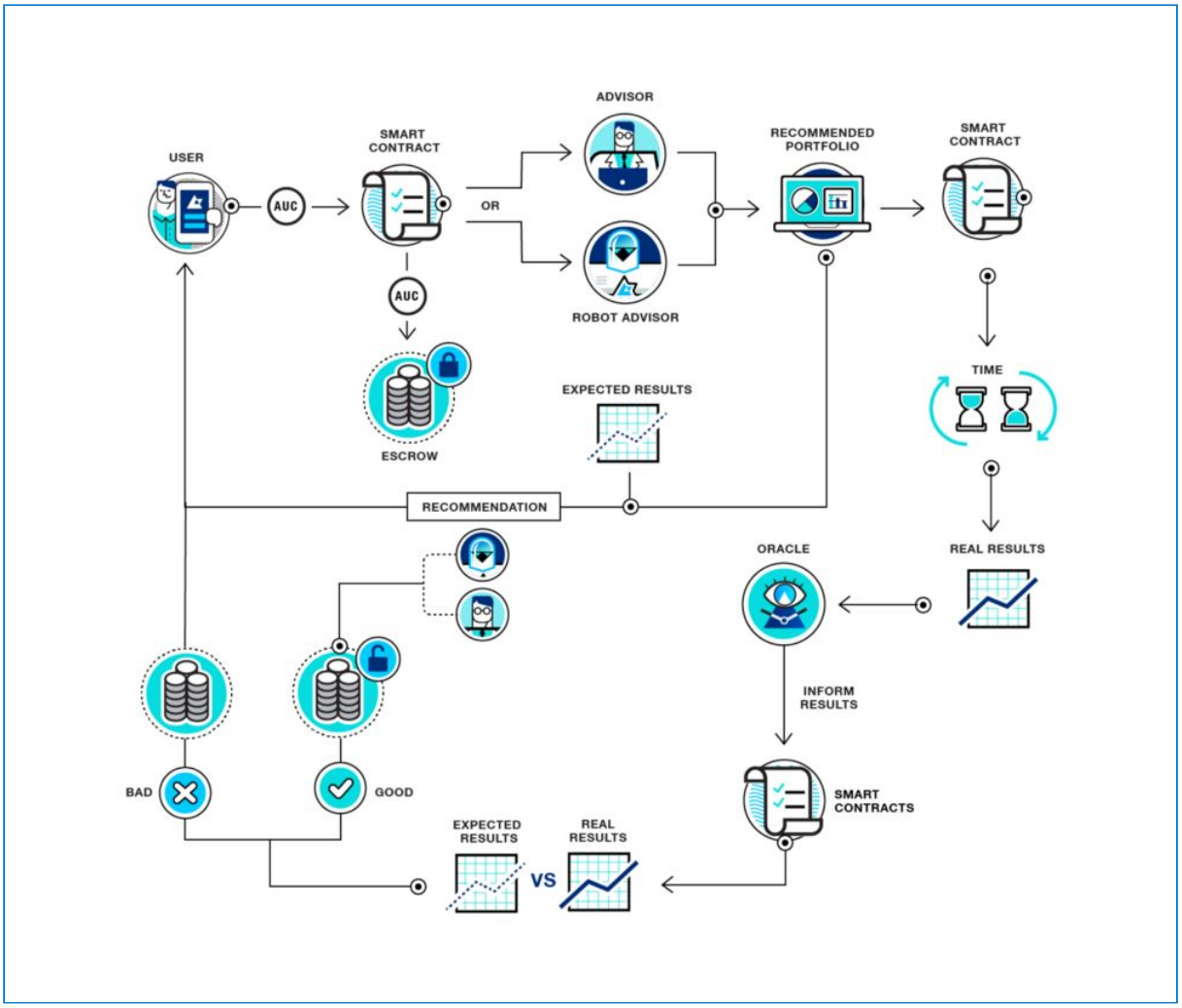
The Auctus Platform will have built-in goal-based tools and robo advisors, but will also serve as marketplace for third-party financial advisory services, allowing users to get tailored recommendations (how much to invest and asset allocation) from human and robo advisors. The fundamental role of the AUC Token is to provide a result-oriented, transparent and low fee structure, aligning the interest of human and robo advisors with savers' goals and ensuring transparency.



In addition to being a platform currency, which enables efficient and frictionless transactions between participants, the AUC token will also be used to help preventing users from paying in advance for bad services or advice. In cases where the nature of the service or tool purchased involves portfolio suggestions and predictions (of returns and risk), the transfer of tokens between the user and the provider can be bound to the results.

The user initially transfers the corresponding amount of AUC tokens to a platform smart contract where it will be held in escrow. He receives a portfolio recommendation (with asset distribution according to his profile - desired returns and tolerated risk) and all the parameters are recorded in the Ethereum blockchain using the platform smart contracts. The

AUC held in escrow in exchange for a particular recommendation can be gradually released to be transferred to the human advisor or developer if the returns meet the predictions, as well as the fluctuations (volatility) do not exceed tolerated levels of risk. The parameters such as vesting period and tolerance will be auditable prior to the purchase of the service or tool. Users can redeem the tokens in case of bad advice. To compare the recorded predictions with the real results, trusted oracles can be used to record data in the platform smart contracts using, for instance, the Oraclize approach[8]. This user flow is illustrated in the following diagram.



Source: Auctus - Token Model Illustration

The platform will be exclusively accessible through the AUC token, which is an integral part of the Auctus Platform. Users holding a higher amount of AUC tokens in escrow can have access to additional and/or premium features and lower annual fees for built-in features.

[8] Oraclize Blog - Understanding Oracles, 2016

8.1. Who should use AUC tokens

Retirement savers

Everyone interested in getting access to a goal based savings platform with built-in analytic tools and robo advisors will need AUC tokens held in escrow to create portfolios, use planning tools, hire services from the marketplace and pay low annual fees. Users will be able to create custom portfolios with automated rebalancing of assets and a mix of traditional assets and cryptocurrencies.

Financial advisors

To be listed in the human advisory marketplace, users will also need to hold AUC in escrow. Tokens are locked as collateral to enforce good behavior (advisors can be penalized for not completing/providing a service or for any kind of malicious behavior). Customers in the marketplace can choose advisors according to their ranking position, price and service description. Services are paid using AUC tokens through smart contracts, and customers that used the services can evaluate the advisors.

Developers

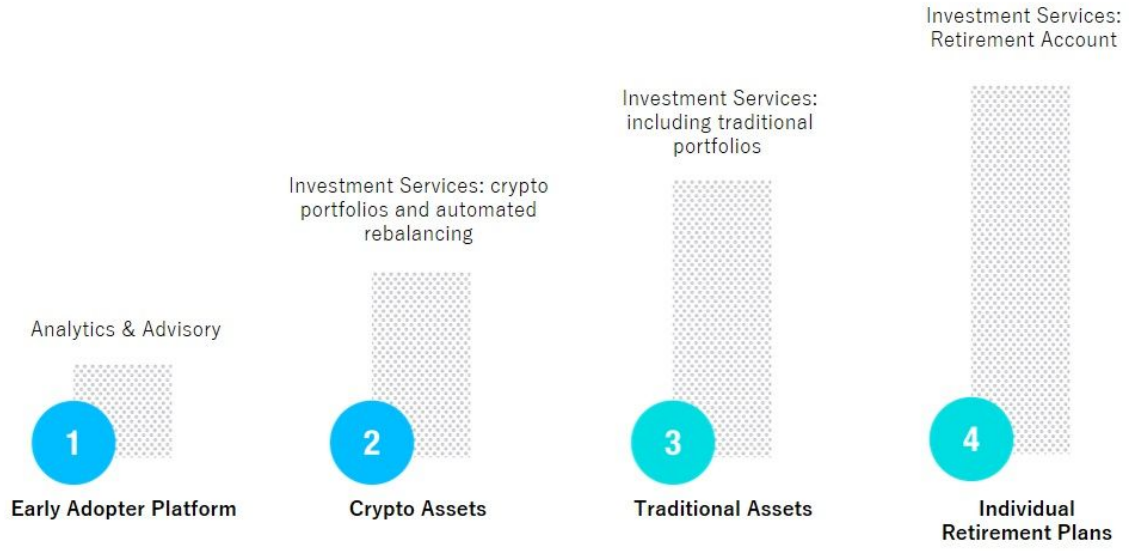
The first version of the platform will have built-in robo advisory and risk analysis tools developed by the Auctus team and its partners. Shortly after, it will be possible to offer third party plugins/add-ons developed by community members holding AUC token in escrow. These will be offered in a second marketplace, a Retirement App Marketplace, intended to decentralize the development and maintenance of risk analysis tools, robo advisors, notification and alert plugins and any other kind of enhancement tool for retirement savers to track their portfolio, optimize their results or get a better projection.

9 - Go to Market Strategy

Auctus aims to penetrate the market as first mover. Auctus is the first truly global retirement plan platform, as well as the first Blockchain and Ethereum Smart Contract based retirement plan provider. Following a fast market entry, the ultimate goal is to capture a substantial market share of the USD 36 trillion global retirement industry.

Our go to market strategy follows a multi pillar approach. Initially we intend to target private retirement investments and individual retirement plans. This allows us a fast market entry on a global scale with relatively low regulatory hurdles. In a second phase, we plan to enter – employer sponsored retirement plans. This second phase requires local adaptation and will face a lot of regulatory constraints.

Our first phase is designed to create a global movement, which should facilitate the launch of phase two.



Level 1 – Early Adopter Platform

The initial level is targeted at early adopters: users with an interest in Fintech and cryptocurrency. This initial solution will enable users to create retirement portfolios with a mix of cryptocurrencies and traditional assets. Subsequently, users will be able to run analytics and get consulted by robo advisory, assuring maximum transparency.

To simplify and accelerate a global market rollout, the first level will feature a virtual upload of assets. Thus funds won't be stored on the Auctus Platform itself. It will be possible to virtually upload existing traditional retirement plans, or savings portfolios, as well as existing cryptocurrency positions and subsequently consult robo advisory and analytics

Level 2 – Cryptocurrencies

Level 2 will have all features of level 1, but the platform will be holding cryptocurrency investments.

Having control over the asset allocation will unlock new features such as automated rebalancing.

Level 3 – Crypto and Traditional Assets

Level 3 will have all features of level 1 and 2, with the addition of traditional investments.

Access to traditional investments will be granted by giving access to traditional portfolios, by either collaborating with a third-party or creating the portfolios itself.

Combining cryptocurrencies and traditional assets will allow the user for example to keep the crypto allocation at a maximum of 10% in an automated way.

Level 4 – Individual Retirement Plans

Level 4 will be the entry into regulated retirement plans. We plan to first enter the individual retirement plans market, as this is relatively lightly regulated.

Despite the likelihood that regulators not allow cryptocurrency as an asset class in retirement plans, we will be able to provide portfolios mixing traditional assets with cryptocurrencies.

From an operational point of view, we will create two portfolios. A traditional portfolio, in line with prevailing laws and regulations, as well as a cryptocurrency portfolio that will be entirely private and non-regulated.

However, our robo advisory and analytic tools will be treating the regulated and crypto assets with the same holistic overview as described previously. This will allow the user to simulate and analyze the optimal mix of cryptocurrencies and traditional assets. In the case of tax exempt defined contribution plans, this also allows the user to secure the maximum feasible amount of tax deductibility.

10 - Team & Advisory Board

10.1 - Advisory Board

Martijn van Eck, Pension Fintech Advisor

Martijn van Eck is PensionTech Lead at Holland FinTech, the globally connected FinTech marketplace and former founding partner at Symetrics, the Amsterdam based European FinTech50 actuarial and risk analytics company, PensionTech start-up trainer, mentor and coach. Martijn's entrepreneurial track record, pension tech experience and passion to bring the pension and fintech industry together, are key qualities that will help Auctus to reach the next level.

Eric Paley, Legal Advisor

Eric Paley is a Partner and member of the Employee Benefits team at Nixon Peabody LLP, a global law firm, with more than 650 attorneys collaborating across major practice areas in the U.S., Europe and Asia. He will assist us in legal compliance, implementation feedback, as well as further establish our footprint within the pension industry.

Adam Greetis, Legal Advisor

Adam is a Partner at Seyfarth Shaw LLP, an international law firm with more than 900 attorneys in the U.S., London, Shanghai, Hong Kong, Melbourne and Sydney. He has considerable experience advising organizations on the legal issues that arise in establishing, sponsoring, and maintaining qualified retirement plans. He has counseled employers on most aspects of ERISA and Internal Revenue Code compliance and through Department of Labor and Internal Revenue Service audits and plan correction programs.

Steven Clark, Financial Advisor

Steven is an Associate Professor of Finance at UNC Charlotte where he conducts research in the areas of mathematical finance, derivative securities, asset pricing, and financial econometrics. Steven has a Ph.D. in Mathematical Sciences and a Ph.D. in Applied Economics, both from Clemson University. He has been published in numerous scholarly journals including Review of Derivatives Research, Review of Futures Markets, Journal of Risk and Insurance, and Journal of Asset Management.

10.2 - Core Team

Felipe Silveira, Lead Developer

Felipe has more than 12 years of software development experience. He brings along more than 7 years experience as Operations Manager and Partner at DTI Digital. Felipe joined DTI right from the start with five former Accenture partners. Within seven years, they grew DTI Digital to a nationwide IT consulting and development enterprise with more than 150 employees. Prior to DTI Digital, Felipe was a Software Developer at Accenture, responsible for a larger team of developers. He holds a BSc in Engineering and a postgraduate degree in Interaction Design.

Felipe's management and development skills guarantee our team will stay on track and adhere to the highest development standards and practices. He is leading the development of the Auctus Platform and is responsible for general management decisions.

Raphael Vantroost, Advisory & Partnerships

Raphael brings along 12 years of financial services experience. He has successfully held various strategy and M&A positions at UBS Investment Bank in Zurich, Deutsche Bank in London and Noor Advisors in Geneva and Dubai. He founded Swissline Real Estate in 2012 and holds a portfolio of more than 70 units. Raphael is fluent in 5 languages. He studied Economics at Basel and Yale University and holds an Executive MBA from INSEAD.

At Auctus, Raphael is working closely with Felipe in regards to overseeing and reviewing the development of the Auctus platform, as well as with the community management team. He is also responsible for Auctus' international relations.

Guilherme Gusman, Front-end Engineer

Guilherme has more than 10 years of software development experience. He is a co-founder and CTO of LG7. Being an engineer and entrepreneur, he has a broad range of experience in starting projects from scratch and dealing with all the challenges that come along with it. He started his career as a software engineer at DTI Digital and went on founding Livobooks, a mobile games producer with partnerships such as Discovery Kids and Animal Planet. With his current partner at LG7, Guilherme started another business called 'VG Resíduos', a waste management software that reduces environmental impact, lowers the risk to be sanctioned and ultimately saves costs. The efficiency of VG Resíduos was recognized when getting ranked 3rd by Brazil's 'Most Promising Startups' ranking. Guilherme holds a BSc in Control and Automation Engineering.

At Auctus, he was chosen as the brain behind our platform, ensuring that our users have a smooth experience managing their funds. Guilherme is also responsible to make the most of the transparency provided by the blockchain layer in order that data can be shown in the clearest possible way at the front-end.

Vinicius Melo, Strategy

Vinicius has gained experience an Investment Analyst at one of Brazil's main pension fund companies (FUNPRESP-JUD). As an insider to the industry, he knows all the issues and challenges that pension funds face nowadays. Vinicius is a certified professional by the Certification Institute of Social Security Professionals (ICSS), mandatory for Executive, Supervisory and Governing Board members, as well as for investment committee members and other pension fund employees directly responsible for investing benefit plans' guaranteeing resources.

At Auctus, Vinicius is identifying constraints and possible future issues and subsequently proposes suitable solutions, enabling our development team to effectively implement the vision for a decentralized pension fund solution.

Ariny Guedes, Lead Ethereum Engineer

Ariny brings more than 6 years of experience as Senior Software Engineer at DTI Digital. He is an expert in C#, Java, C++ and Ethereum Blockchain. He holds a BSc in Control and Automation Engineering.

Ariny is our most productive developer and can virtually program anything. He works relentlessly until a project is completed. He is responsible for defining the structure of the Ethereum blockchain layer of the platform and is our main programmer.

Daniel Duarte, Senior Software Engineer

Daniel is a Senior Software Engineer with more than 7 years of experience at DTI Digital, where he has been promoting blockchain technology and has led in-house blockchain initiatives. He holds a BSc in Control and Automation Engineering and has further certifications in Machine Learning and Salesforce Development & Management.

At Auctus, Daniel is working closely with Ariny, leveraging his deep knowledge of blockchain technology and automation and is a key player in developing the Auctus platform.

Thiago Araújo, Senior Software Engineer

Thiago has been 7 years with DTI Digital as Software Engineer prior to joining Auctus. He has led numerous large-scale software and automation projects with a focus on risk management and cyber security. He holds a BSc in Engineering, Automation and Robotics.

At Auctus, Thiago plays a key role in the development team. He focuses on making the Auctus platform stable and secure, minimizing risks such as hacking, blockchain overload, server overload and wrong transactions.

Daniel Vitorino, Senior Software Engineer

Daniel has more than 8 years experience in software engineering, 7 of which working as Development Leader. He gained experience working as a Tech Leader at Itaú - the largest bank in Latin America. Daniel is an experienced full-stack developer, whose know-how extends from database modeling and tuning, to fine mobile/web layout adjustments. He holds a BSc in Control and Automation Engineering.

At Auctus, as a member of our strong development team, Daniel is integral in designing and developing our platform. He makes sure we're adopting the best development practices in a lean and efficient way.

Ludmila Lopes, Marketing & Community Manager

Ludmila brings more than 5 years of software engineering experience, as well as time working as Director for a university enterprise where she oversaw the marketing team. She holds a BSc in Software Engineering.

At Auctus, Ludmila is responsible to develop and regularly update the community. Her deep understanding of software, combined with her interest in marketing and community management, allow her to effectively spread Auctus' values.

Daniel Boaventura, Operations

Daniel is a supply chain management expert with 7 years of supply chain experience working for ESAB. He holds a BSc in Mechanical Engineering and a CBA certification in supply chain.

At Auctus, Daniel is leveraging his experience in supply chain, by overseeing the operations. He is coordinating and guaranteeing timely execution of the platform, making sure our timeline is met. Furthermore, he is also coordinating bounty campaigns and our crowdsale.

11 - Collaborations

Auctus is collaborating and using third party services in various areas to strengthen the services offering of the Auctus Platform.

Auctus will be supported by other projects and companies in the following areas:

Robo-Advisory: Horizon Investments Inc., United States
Analytics: Symetrics B.V., Netherlands
Asset Lending: Ripio Credit Network, ripiocredit.network
Decentralization of Operations: Aragon, aragon.one
Trading: 0x, 0xproject.com

12 - Roadmap

Q1 2017	• First Whitepaper Drafts
Q2 2017	• Launch of Auctus
Q3 2017	• Pre-sale
Q4 2017	• Demo release • Business Advisory Board
Q1 2018	• Strategic Partnerships • Company Incorporation • Alpha Release • Main Token Sale
Q2 2018	• Partnership with exchanges • Asset Management Certificates
Q3 2018	• Beta Release (analytics & advisory)
Q4 2018	• Ceres Release (cryptocurrency assets)
Q1 2019	• Phoebus Release (tokenized assets) • Traditional Asset Management Licenses
Q2 2019	• Minerva Release
Q3 2019	• Jupiter Release

13 - Development Milestones

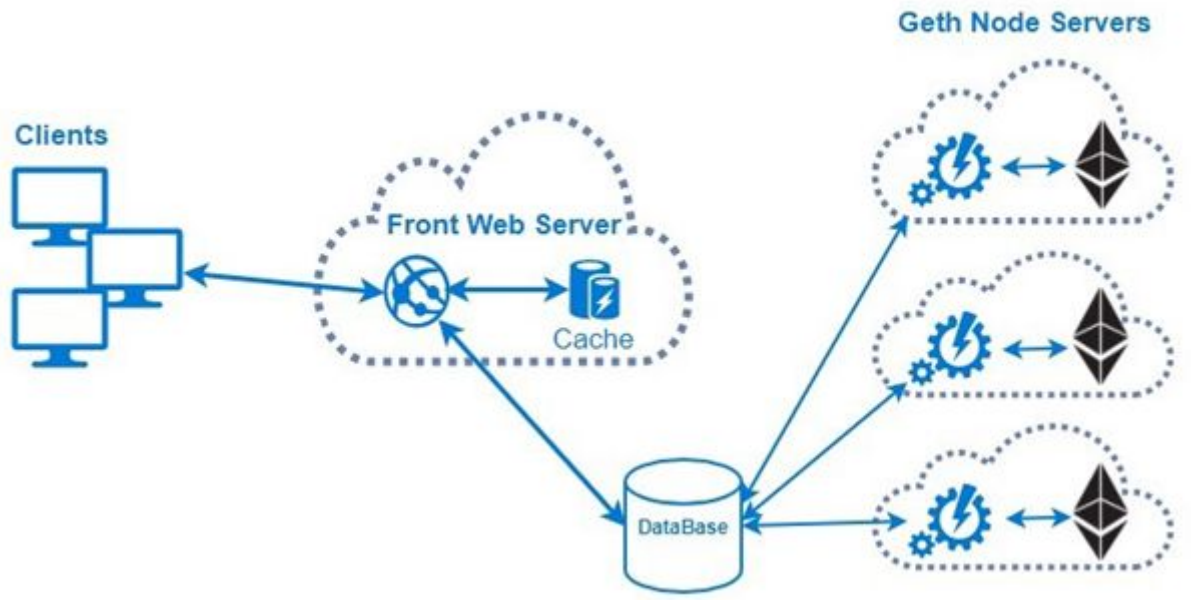
Auctus will develop a series of releases with increasing complexity and features. The purpose of the development strategy is to be positioned as the first mover in the blockchain retirement plan market, as well as keeping maximum upside to evolve in a fully integrated platform.

		Demo	Alpha	Beta	Ceres	Phoebus	Minerva	Jupiter
	Testnet	●	●					
	Mainnet			●	●	●	●	●
	Desktop UI	●	●	●	●	●	●	●
	Mobile UI		●	●	●	●	●	●
Analytics & Advisory	Analytics			●	●	●	●	●
	Robo Advisory			●	●	●	●	●
	Human Advisory		●	●	●	●	●	●
	Marketplace		●	●	●	●	●	●
Investment Services	Virtual Asset Upload	●	●	●	●	●	●	●
	Cryptocurrency Trading				●	●	●	●
	Traditional Assets					●	●	●
	Automated Rebalancing						●	●
	Recurring Funding							●

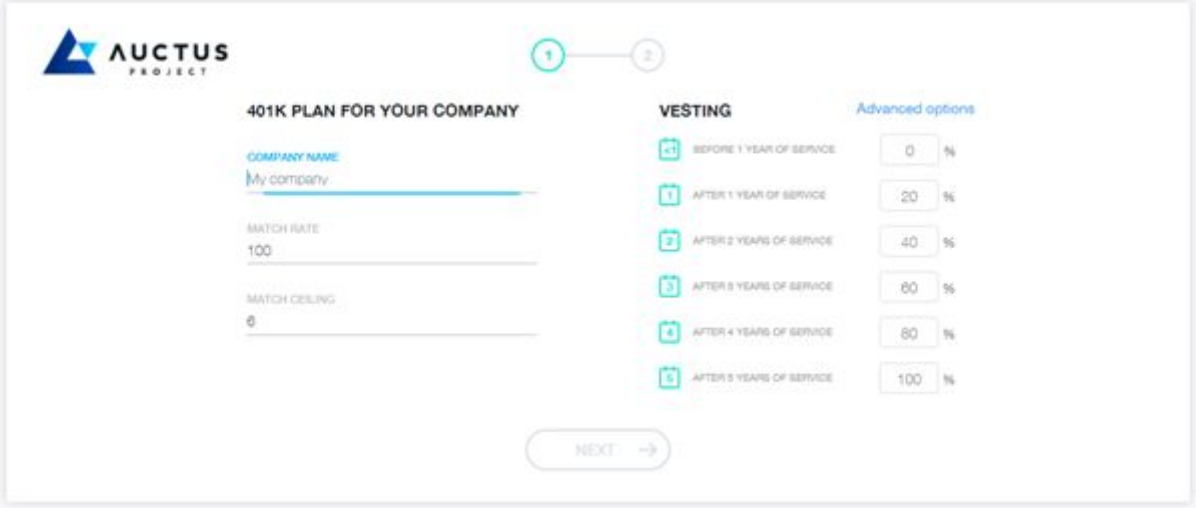
13.1 - Auctus Demo

The first development milestone for Auctus was the release of the demo platform (https://demo.auctus.org/), which was released on Nov 7th, 2017. The demo was created to illustrate the emulation of retirement plan constraints, for example 401(k) plans, into smart contracts using the Ethereum Network.

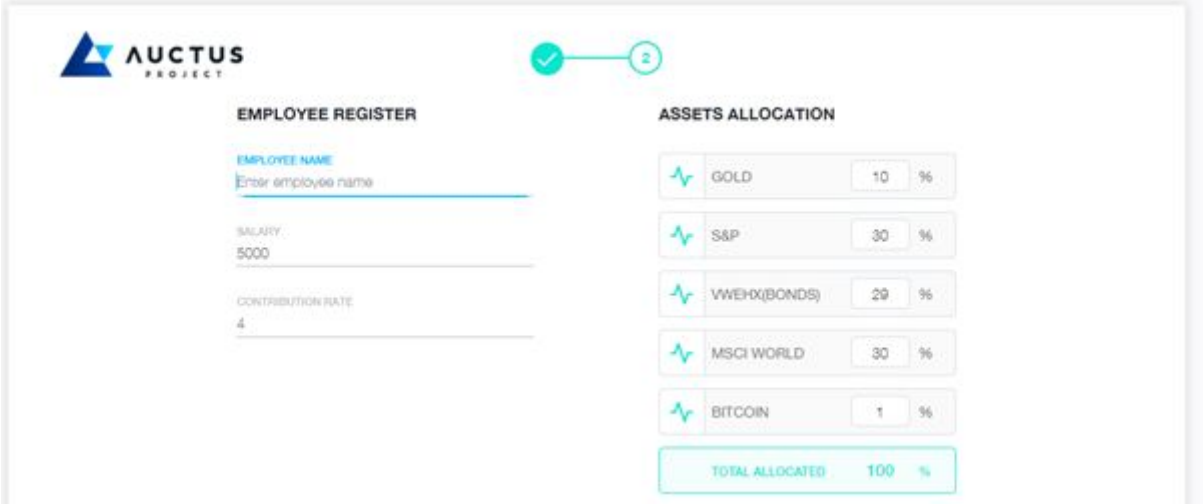
The demo was developed in C#, using the .NET Core cross-platform and open-source framework. The idea was to create a friendly user interface using the MVC pattern to simulate a retirement plan where the backend code dynamically generates and deploys smart contracts in the Ethereum test network Rinkeby.

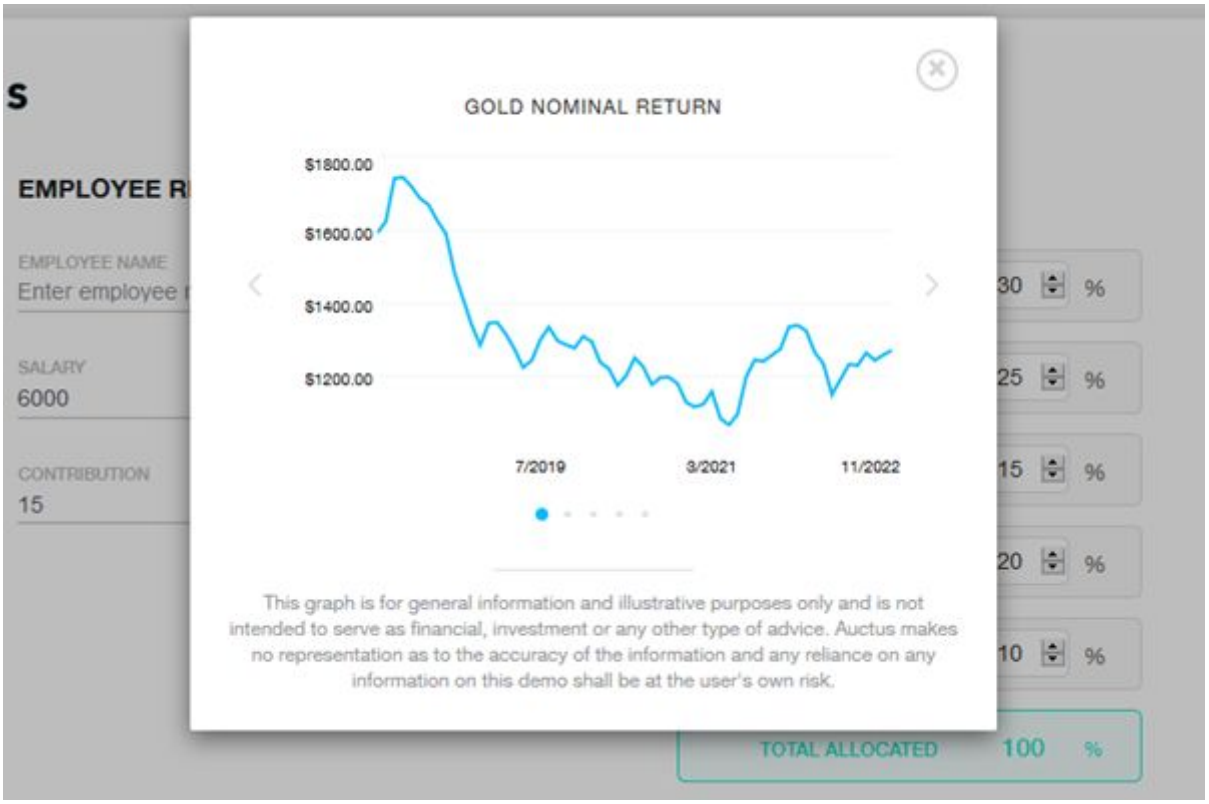


The processor power was divided into 2 servers: one for the web layer of the application and the other for running Ethereum nodes. The communication between the servers is made through a shared database. The client communicates with the Front Web Server nodes, that save client's data in the database. Geth Node Servers subsequently receive this data, publish the smart contracts and generate Rinkeby Network transactions. After that, both servers initiate a polling process to monitor contracts/transaction creation and update client data.



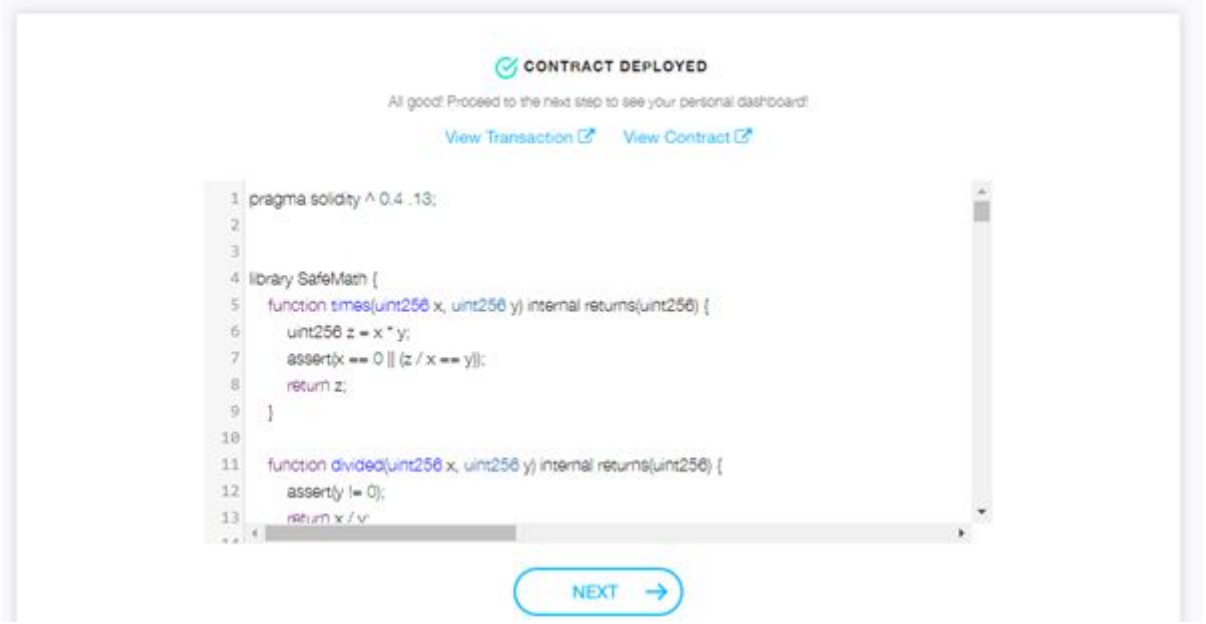
In the demo, the user is able to input the constraints of the simulated employer-sponsored retirement plan (employer match rate and ceiling, as well as vesting period) and define a static asset allocation for the plan. Certain assumptions and simplifications were made, such as historical data to simulate portfolio returns and the static allocation used.





Source: Auctus Demo

Afterwards, a smart contract is generated using a template where the chosen parameters are replaced in the code and the contract is deployed in the Ethereum testnet (users are able to track contract creation and transactions using https://rinkeby.etherscan.io/).

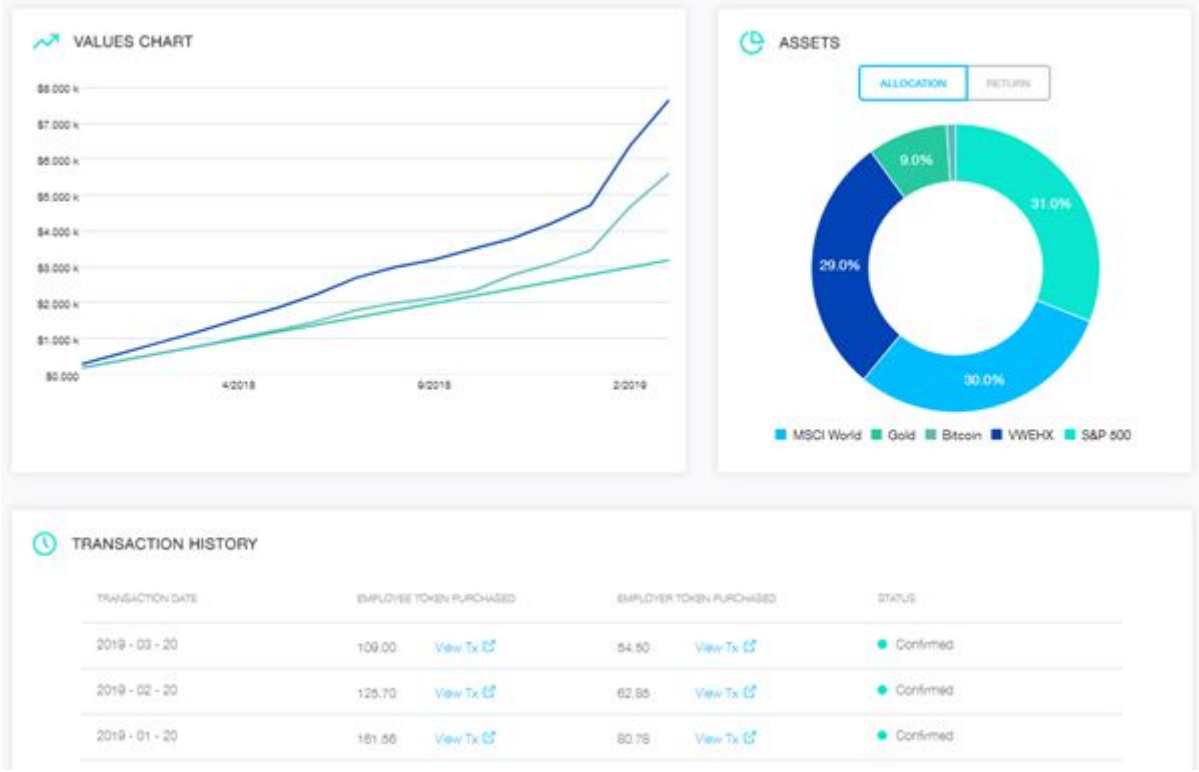


Source: Auctus Demo

The final step of the demo is the user dashboard, where it is possible to simulate contributions (all deposits are represented by Ethereum transactions in the testnet) and track portfolio performance in a total of five years.

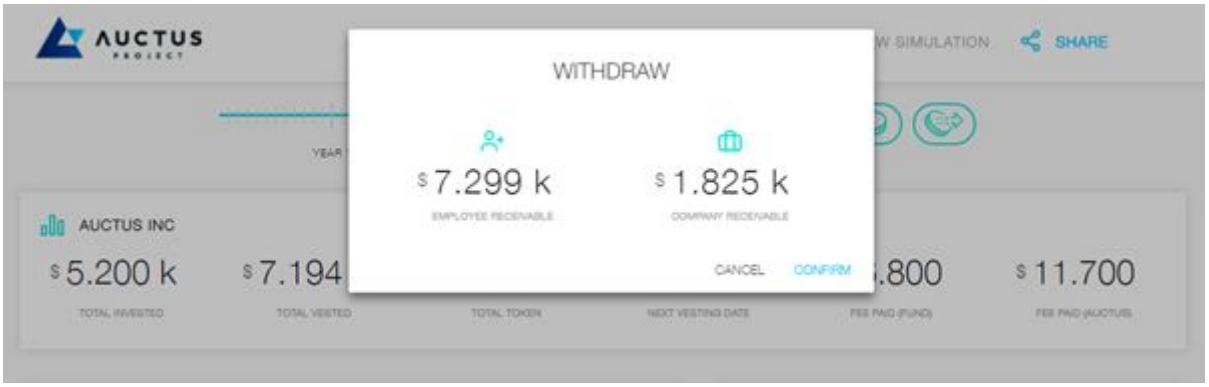
Source: Auctus Demo

The result is shown in a chart that is updated every time a transaction is confirmed in the testnet. The links to all transactions are shown in a table and it is possible to track them on Etherscan.



Source: Auctus Demo

At any moment, it is possible to end the simulation withdrawing the funds (also recorded on Ethereum testnet) and the amount the user will get respects the vesting rules and the period simulated.



Source: Auctus Demo

13.2 - Auctus Alpha

The next development milestone is the release of an alpha version of the platform.

The alpha will illustrate the portfolio recommendation features of the full platform, as well as the human advisory marketplace. Users will be able to set their goals and get a portfolio recommendation with expected returns. They will also be able to register themselves as advisors and make projections for different portfolios. Those recommendations will be offered in a public marketplace.

Some of the architectural aspects used in the demo and the lessons learned are useful for the alpha, but at the same time a lot is being improved. The transition from the alpha to the full platform will include adjustments based on alpha testing and feedback from the community.

13.3 - Development of the automated investment product

In parallel with releasing the alpha platform, the development team is planning the inclusion of investment features, such as asset management, automated portfolio rebalancing and exchange execution.

The idea is to treat the two core groups of functionalities in the platform as separate products that will be later combined to give the users the full experience. The first group consists of analytics, robo and human advisory marketplace and the tools and dashboard to track performance. The second group consists of asset management, automated investments, recurring funding and exchange between tokenized assets.

The third milestone is to start the development of the features in the second group of functionalities, which will be guided by the definitions made together with the business development team, such as applying for licenses, partnering with providers of tokenized traditional assets, integrating with a decentralized exchange protocol (0x protocol[9]) and

[9] https://0xproject.com/

integrating with other platforms that might provide functionalities that are out of the scope of Auctus platform.

13.4 - Blockchain and token integration

After thoroughly testing tha alpha and gaining feedback from the community and advisors, the next milestone is to integrate the AUC token with the platform and deploy it on the Ethereum network.

13.5 - Auctus Beta

The beta platform will consist of all alpha features, including improvements and adjustments made during testing period, plus the robo advisory marketplace, additional built-in tools, all integrated with smart contracts and using the AUC token as the only payment mechanism.

The Auctus Beta will be released on Ethereum mainnet. The trading and asset management features will be gradually added on later releases and updates.

14 - Token Sale & Allocation

The team behind Auctus has been following the latest token sales to gain perspective and learn from mistakes and successes. It is important to us to act in the interest of token sale participants at all time and therefore believe it is crucial to align interests between the community and developing team.

14.1 - Token Sale

No Offloading of Ethers

We have seen many other companies exchanging Ethers (ETH) for fiat currencies right after the token sale, thus placing downwards pressure on ETH's price. We believe that the strength of the Ethereum network and community is an integral part of our success. We view ETH offloading as unhealthy for the market and also economically disadvantageous for our project. We will therefore keep our funds to a large extend in ETH and only exchange to conventional currency whenever expenses need to be made. To guarantee this, our raised Ethers will be locked by smart contract and vested as follows:

- 20% of raised ETH after token sale
- 5% of raised ETH per month

Vested AUC Token for Team Members and long-term partnerships

The entire Auctus team, as well as long-term strategic partners, will have vested AUC token to incentivize fundamental long-term success. Auctus has a long-term vision and wants to significantly grow the community over the years. To guarantee this, team members will have vested AUC tokens to make sure there is a strong incentive to reach milestones and achieve long lasting success.

AUC Tokens for Auctus team members and long-term partners will be vested as follows:

- 2-year vesting period
- 6 month cliff

This means Auctus team members won't be able to transfer AUC token immediately after the token sale. Token sale participants will of course be able to transfer AUC token immediately after close of token sale.

Guaranteed participation without spending a lot of gas

To participate in the token sale, every participant will have to register for our whitelist. The token sale whitelist is already available at auctus.org. Prior to the token sale start, whitelisted registrants will get an electronic KYC/AML form that they will have to fill out.

On the first day of token sale, every registrant will have guaranteed access to purchase a pre-defined maximum amount of tokens. The maximum will be defined as follows:

Max amount of AUC token available in token sale / whitelist registrants = Max contribution on day 1

On the second day of token sale, the maximum contribution will be increased to 3x the amount of day one. On day three and thereafter, no restrictions will be in place.

This process guarantees participation in the token sale process for every whitelisted participant, without the need to rush and without the need to spend a lot of gas. Furthermore, this process democratizes the user base, making the Auctus community diverse and strong, significantly reducing the risk of large token holders taking advantage of the community and acting in an undesired way.

Transparent and Auditable Smart Contract for the Token Sale

The smart contract will be revealed a few days prior to the token sale, allowing quality control and auditing of the locking rule. Revealing the contract early will help to avoid funds being sent to an incorrect address. Furthermore, the contract address will be revealed using the name ***auctusproject.eth*** which is already registered on ENS (Ethereum Name Service - https://ens.domains/) to reduce the chance of phishing attempts in the token sale process.

Token Sale Summary

- Token Price: 2000 AUC / ETH
- Date: Q1 2018 (to be announced)
- Total Minimum cap: (to be announced)
- Hardcap: (to be announced)
- ETH accepted only
- Mandatory whitelist registration
- Tokens will be immediately transferable after the Token Sale ends

Pre-Sale Summary

Our pre-sale took place well in advance of our token sale (3 - 6 October 2017), prior to any release of development, as well as prior to the creation of advisory board and partnerships.

The pre-sale was conducted as a test run for the token sale, limiting the maximum contribution per participant at 10 ETH. The intention of the pre-sale was to raise a controlled amount of funds, allowing us to organize a token sale of the highest quality, while being able to afford legal advice and media/PR support from leading companies.

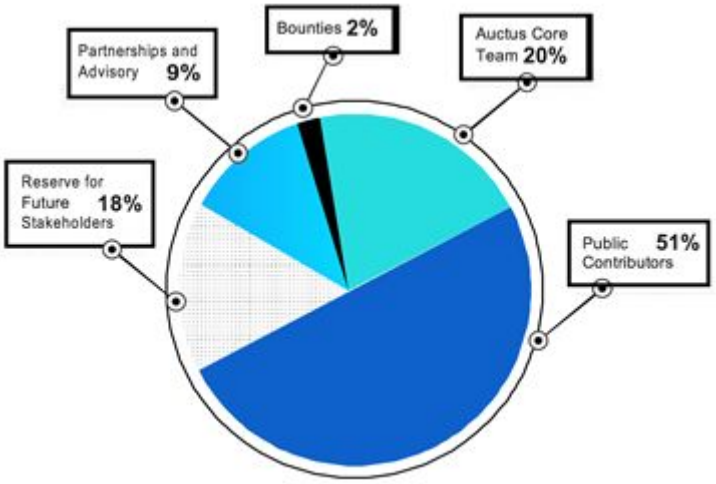
Pre-Sale specifications:

- Max contribution per participant: 10 ETH
- Date: 3 to 6 October, 2017
- Minimum cap: 400 ETH
- Token Price: 2500 AUC / ETH
- All pre-sale tokens are non-tradeable and locked by smart contract until end of token sale (Q1 2018)

Pre-Sale results:

- 958.9 ETH raised
- Soft cap of 400 ETH raised within 10h 56m only
- 272 valid transactions completed
- 254 distinct addresses
- An average of 3.52 ETH per participant
- Min cap surpassed by 240%

14.2 - Token Allocation



Public Contributors (51%)

51% of all tokens will be made available to the community. The intention is to create a diverse and strong community with the maximum amount of long-term supporters, ideally with an interest of using the Auctus Platform.
Tokens will be immediately tradeable after close of token sale.

Auctus Core Team (20%)

20% of AUC supply will be allocated to Auctus' Core Team (founders, early backers and the development team) for a long-term alignment of interests.
Vesting: 2 year vesting with 6 month cliff. This means tokens will not be immediately tradeable.

Reserve for Future Stakeholders (18%)

To allow for possible capital raises in the future, 18% of tokens will be reserved for future stakeholders. This decision was based in the study of other technology projects and startups. This stakeholder reserve will be locked via smart contract for 12 months. It will only be used if there is a need, or opportunity, to accelerate the growth of the company. This reserve can be used for strategic partnerships, to encourage the adoption of the Auctus Platform and the provision of capital in case of excessive devaluation of ETH. If deemed unnecessary, these tokens will be burned.

Partnerships and Advisory (9%)

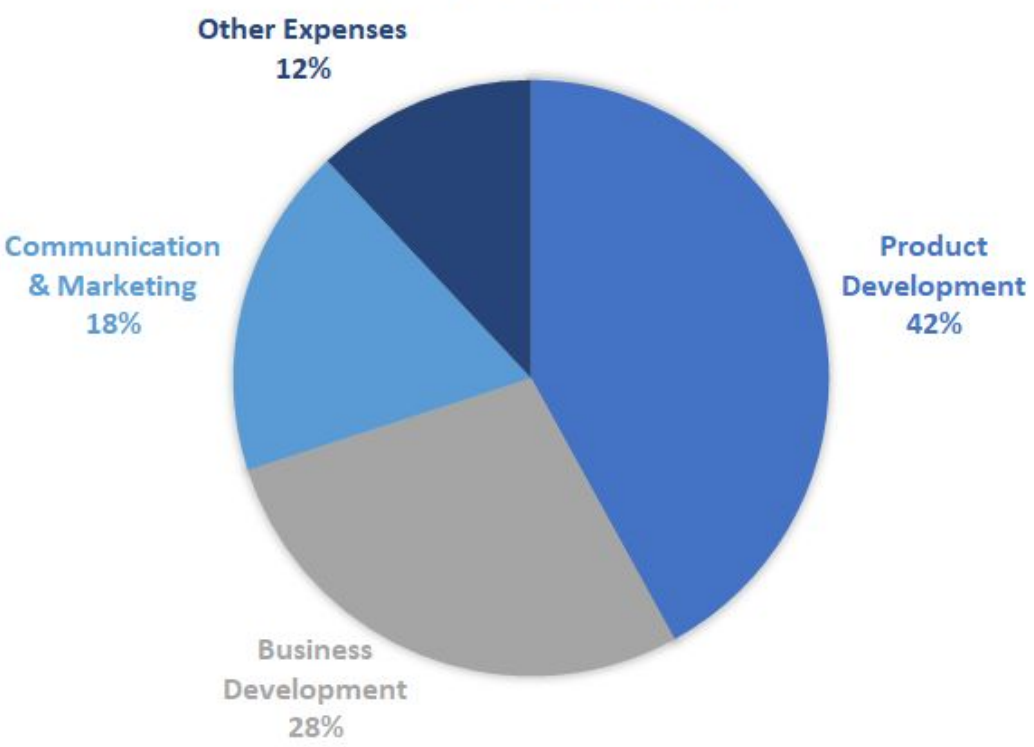
9% of tokens are allocated for partners and advisors.

Vesting: 6 month vesting, with 3 month cliff. This means they will mature 50% of their tokens at the end of the third month, and the rest at the end of the sixth month.

Bounties (2%)

Max of 2% of tokens are allocated for bounty campaigns to help us spread the word about Auctus: Bitcointalk Signatures, Bitcointalk Translation, Facebook, Twitter, blog articles, media publication, thread support, etc.

15 - Use of Proceeds



Product Development (42%)

The main use of funds will be to release the Auctus platform. If the minimum cap is reached, the development will continue with current team size and current offices.

The 42% allocated for product development includes:

- Software licenses and server expenses;
- Design (UI / UX);
- Office expenses;
- Salaries;
- Security audits / technical due diligence.

In the case where more than the minimum is reached, Auctus will be able to expand the development and design teams and move ahead faster.

Business Development (28%)

There is a big challenge ahead of us to get where we want to be, as we have the intention of expanding the MVP to the full platform with asset management and automated investments. We will use 28% of the funds raised for this. The business development costs include:

- Hiring specialized law firms to help us with regulatory and licensing frameworks for the investment platform and entering retirement markets;
- Educate users on the use of the platform;
- Secure strategic partnerships with other companies and projects, both traditional and blockchain;
- Onboard of more business advisors, new clients,
- Sales staff;
- Travel expenses to attend in conferences and events.

Communication and Marketing (18%)

We will have PR partners and run marketing campaigns to increase platform adoption and project awareness. The allocation of 18% of funds raised for this includes:

- Building local communities (marketing campaigns in different languages aiming at different markets);
- Keep the social networks and communication channels updated and well managed;
- Produce videos;
- Regular press releases with project updates.

Other Expenses (12%)

We estimate that other costs that are not directly related to development, business or marketing will consist of 12% of the total. Those expenses include administrative and operational costs, human resources consultancy for expanding the team, a small reserve for unforeseen events and other services (calls, printing, Ubers, etc).

16 - Marketing Strategy

Auctus plans to be the first mover in the retirement cryptocurrency / robo-advisory space. This allows us to run a tailored marketing strategy that is based on three pillars:

Targeting Innovators and Influencers

We are initially targeting tech-savvy consumers with lower barriers of entry. Employees of other cryptocurrency projects, that seek to have an innovative retirement solution will be our initial target clients.

Innovators, the alpha-dog of influencers, take pride in being the first to know about, try and/or have something before everyone else. We will target this client segment by working with targeted social media articles, but without banners. Quality marketing and getting referrals from influencers will be at the center of our marketing strategy.

Fintech and Retirement Plan Events

As we're an innovative product, we can relatively easily get featured in retirement and Fintech magazines/websites. To increase chances of publication, we plan to take part in major Fintech events as well as retirement plan conferences.

Social Media

As a third pillar of our marketing strategy, we intend to launch targeted social media campaigns, aimed at the cryptocurrency community. A mix of information, education and gamification of our platform should get the necessary intention and traction.

17 - Risks

Regulatory risks

Auctus warns investors that we are not in control of possible changes in blockchain technology laws. This market is constantly changing and Auctus is not responsible for regulation changes on blockchain technology that would adversely affect the development of the project.

Technological risks

An open-source development comes with risks related to hacking and cyber attacks that can cause a negative impact. To mitigate that risks the team will be allocating resources in auditions and security tests, to ensure the platform's safety.
Also blockchain development is relatively new and there will be a challenge requiring human resources with this specific knowledge.
In addition, as Auctus plans to have a fully system-controlled marketplace there is a risk that robo advisor platform can't adapt to increasing business volumes and changes. To mitigate this we plan to allocate resources in server scaling and have 24/7 infra support.

Financial risks

Investment in Auctus tokensale is considered high-risk, as with other similar ones. Investments in Auctus do not guarantee income.
According to the token model description in this paper the ownership of AUC token does not provide right to property in Auctus. AUC token are used to pay fees and give access to special features inside Auctus Platform. Auctus is not responsible for the fluctuation of the AUC token if it is listed on third-party exchanges.
When exchanging tokens to fiat the operation can be charged by exchanges and can imply government taxes. If any jurisdiction implements a new law there is a risk that investors be obliged to pay additional taxes and charges against funds invested in AUC and Auctus Platform.

Business risks

Having a technology-based platform might reduce the amount of clients Auctus can reach. Some investors are still reluctant in trusting your portfolio's investment in a robo advisor than in a human expert. To mitigate that risk we are also implementing the possibility of human experts developing portfolio suggestions to the platform. Another risk involved is regarding investment's goal and investor's risk. Since those parameters are inside the platform that can be a misunderstanding in assets allocations according to the investor's real needs.

Conclusion

The Auctus team has the mission of providing high quality products and services globally, using trustless marketplaces powered by smart contracts and blockchain technology. Our ambition is to empower retirement savers, giving them control over their savings through a transparent and efficient platform with all the analytic tools and robo advisory they need. We intend to create a community that helps itself to grow, bringing customers, developers and service providers together in a balanced ecosystem where everyone has the incentive to play their roles and help each other.

The token sale process described in this document is intended to allow a wide range of individuals to be part of our long-term mission and to make the project financially viable, helping us to grow sustainably and achieve our development, regulation and market penetration goals.

We would like to express our very great appreciation to everyone that has been supporting our project through feedback, advice, criticism, compliments and technical support. We would like to especially thank the Ethereum community for laying the groundwork, paving the way for this project.

Appendix A: Historical Context

First Retirement Plans

The history of retirement plans goes as far back as Ancient Rome (753 BC to 476 AD), where soldiers were guaranteed income after they retired. The first pension funds were recorded in the 17th century in Germany. For example, in 1645, Duke Ernest the Pious of Gotha, founded a widows' fund for clergy, and another for teachers in 1662. Subsequently, various schemes of provision for ministers' widows were established throughout Europe around the start of the eighteenth century. Some were based on a single premium, others based on yearly premiums to be distributed as benefits in the same year.

First Pension Plan in Europe

The first national pension plan was enacted in 1889 by the Prussian Chancellor Otto von Bismarck. Pension payments started at the age of 70, decreased to 65 in 1916. Although notoriously named ‘iron chancellor’, Bismarck also introduced an individual basic income insurance for the elderly, injured and ill in 1889. In England, the first ‘old age’ state pension was introduced in 1908. In The Netherlands, the Dutch Civil Servants Pension Fund (ABP), now among the five largest pensions funds in the world, was founded in 1922.

First Pension Plan in the US

In the US, public pensions got their start with various ‘promises’, some informal and some legislated, made to veterans of the Revolutionary War (1775) and, more extensively, the Civil War (1861). The first corporate pension in the U.S. was established by the American Express Company in 1875. The plan applied to workers who had been with the company for 20 years of service, and had reached age 60. By 1950, nearly 10 million Americans – or about 25 percent of the private sector workforce – had a pension. Ten years later in 1960, about half of the private sector workforce had one.

Defined Benefit Plans

After a few pension plans began to fail, the government-enacted Employee Retirement Income Security Act (ERISA) in 1974 made pension plans more secure by establishing legal participation, accountability and disclosure requirements. With ERISA came the Pension Benefit Guaranty Corporation, which insures employee benefits should a pension plan fail. This type of guaranteed pension came to be known a defined benefits plan. Workers knew exactly how much they would get in retirement, because it was a defined dollar amount or percentage of salary.

Defined Contribution Plans

In 1978, the so-called 401(k) retirement plan was introduced in the US. The 401(k) is a well-known example of a ‘defined contribution plan’. In defined contribution plans, the

employee bears the risk attached to his or her retirement benefits. In return, the employee has more control over his or her retirement investments than in the case of a defined benefit plan. Other examples of defined contribution plans are 403(b) plans, 457 plans and Thrift Savings Plans.

Pension Funds in a Changing World

After World War II, state pension schemes became more widespread. Simultaneously, corporate pension funds gained prominence. Liberalization of financial markets and privatization of pension schemes in the 1980s and 1990s brought the sector a more prominent role in money markets and capital markets. Following the credit crisis, volatile financial markets and increasing regulation force retirement plans to rethink their future. Simultaneously, increasing mobility, individualization and technological change confront retirement plans with new challenges.

Appendix B: Analytics & Projection Tools

This section provides information on the risk analytics that will be available on the Auctus Platform.

Stress testing (Scenario Projections)

Users can view the estimated performance of their portfolios, and of the assets in their portfolio, under various macro-economic scenarios and over any time range. If a users wished, robo-advising algorithms will proactively run scenarios for users and alert them to possibly important results.

Scenarios can consist of various components. They can contain shocks to assets or macro-economic indicators. For example, US inflation could be shocked positively, thus creating a “high inflation scenario”, allowing the user to see how high inflation would affect his portfolio’s performance. Scenarios can also specify hypothetical trajectories for macro-economic indicators. For example, a scenario could specify that the oil price goes to 100 US dollars in the coming year. Again, the estimated effect of this development on the user’s portfolio would be instantly available.

The third component of macro-economic scenarios are various kinds of economic behavior. For example, the Federal Reserve Bank can be explicitly modelled as a central bank controlling the US interest rate based on its monetary policy. By including such explicit behavioral modelling in scenario projections, they become less reliant on “black box” statistical projections, more realistic, and better able to present users with the actual risks that their portfolios face. The scenario generator used by Auctus is unique in its abillity to combine advanced statistical modelling with economic behavior.

The scenarios available to users on the Auctus platform can combine shocks, hypothetical trajectories and economic behavior in arbitrary ways. Predefined scenarios will be available to users who want to quickly stress-test their portfolios. Advanced users can also change predefined scenarios, or build new scenarios of their own. Users will have the ability to share scenarios they have created on the platform.

Scenarios can be calculated over any time range. Some users may be interested in the near-term effects of certain shocks, say in the next 6 to 12 months. Others may select a much longer horizon, say 5 – 10 years, to see how a scenario affects the value of their portfolio as they get closer to actual retirement.

Risk Metrics

The following risk metrics will be available for users’ portfolios. All metrics are available based on historical data (backward looking) or scenarios (forward looking):

1. Risk & return:
Portfolio return and its volatility. The full probability distribution of returns is available for advanced users.

2. Value-at-risk:
The portfolio return such that only in a certain, low percentage of cases compounded return will be lower.

3. Expected shortfall:
The expected portfolio return in a certain, low percentage of worst cases.

4. Maximum drawdown:
The maximum decline in portfolio return.

5. Impact on risk-return profile:
Comparison of a portfolio's risk and return with a fixed, e.g. historical, risk-return profile. For example, if the risk and/or return of a user's portfolio significantly worsens, the user can be alerted so he or she is able to make changes.

6. Portfolio calculator:
Simulation of a portfolio's value given intended monthly or yearly deposits or withdrawals.

Portfolio Optimization

Users will be able to optimize their portfolios' asset weights under various well-known measures. These include the Sharpe Ratio, Information Ratio, Sortino Ratio and M2. Optimization can be done based on historical data or scenarios. Advanced users have access to the full efficient frontier, giving risk-minimizing portfolios at desired portfolio returns.

Users are able to add asset weight restrictions to the optimization. For example, they can specify that a certain cryptocurrency's weight should be between 5% and 10% of the portfolio. Also, users can construct subportfolios. A user may for example have a "cryptocurrency subportfolio", next to a subportfolio of traditional assets. In the optimization, the weights of the subportfolios might be changed, but their internal compositions remain fixed.

A user may also be interested in only a partial optimization of his or her portfolio. For example, the user may consider selling a traditional asset and buying a cryptocurrency, but keeping the rest of the portfolio unchanged. Such a "bilateral optimization" will be possible. Moreover, the user will be presented with the best possible alternatives for an asset he or she is considering selling. These alternatives will be taken from a large international dataset covering all major investment assets.

Crisis Hedging

Users may be specifically interested in protecting their portfolios' performance under adverse economic circumstances. In order to do this, they are offered a list of the best crisis-hedging assets tailored to their portfolios. Adding one or more of these assets to their portfolios provides a diversification of risk when it is needed the most.

Actuarial Analysis

This is mostly relevant for defined benefit retirement plans. Given the collective nature of such retirement plans, users (both members of the plan and employers) can inspect the funding ratio of the plan. The funding ratio is a well-known measure for plan's ability to pay off all liabilities. In order to calculate it, both the plan's assets and liabilities are simulated into the future, then discounted and divided on each other. When simulating a plan's assets and liabilities, we take into account the plan's investment policy (e.g., rebalancing restrictions on asset weights) and indexation policy (e.g. under what circumstances does the plan inflation-correct its liabilities).

Defined benefit retirement plans face many regulatory requirements, varying across countries and regions. For example, various kinds of funding ratios and reserve requirements need to be calculated for defined benefit plans to remain compliant. In order to provide all necessary information, we have general modelling and expertise already available. This can be relatively easily adapted to specific defined benefit markets added to the Auctus Platform.