Whitepaper

Preventing Workplace Accidents through Blockchain and AI

v1.4.2

Safeguard

You must read the terms at the end of this whitepaper carefully before making any decision to participate in the Safeguard Token Sale.

Executive summary

Safeguard is an established organization operating at the forefront of safety innovation. With a strong team and a working product since 2015, Safeguard is now raising €10,000,000 worth of NEO to achieve it's biggest milestone yet: developing an open-source, AI-powered accident prediction and prevention platform that can make any workspace significantly safer.

Every day, thousands of people are faced with work-related injuries and safety threats, with an estimated 10 fatal accidents per day in the US alone. Apart from peoples' livelihoods and health being at stake, the costs of workplace injuries are also immense; with the EU spending an estimated €476,000,000,000 each year, despite European working conditions being deemed relatively safe. In most cases, injuries are easily preventable, had the safety risk been foreseen and intentionally avoided.

Safeguard's current crisis communication platform provides a measurable solution to this problem, enabling small and large organizations to manage their safety practices at a data-driven, operational level. Some of our current clients include:

Looking forward, the Blockchain-based Safeguard Protocol and its associated ecosystem will act as a safety-tech platform which others can use and contribute to. Hereby, organizations and developers are empowered to co-develop particular use cases and specifications on top of the platform's core functionalities. To achieve this, the current (licensed) Safeguard Platform is going to be converted into an entirely open-source ecosystem. The Safeguard Token (SGT), forms a pivotal part of this ecosystem, enabling users with access to the Protocol whilst facilitating the incentivization of code contributors.

The Safeguard Foundation, a not-for-profit organization, will oversee the Safeguard Protocol. The Foundation serves the purpose of making accident prevention software universally available, enabling as many people as possible to benefit from safer work and living spaces. The Safeguard Foundation is therefore also responsible for growing Safeguard's use cases beyond work safety. Ultimately. this enables the platform to better facilitate safety in public spaces, recreational facilities, municipalities and entire communities.

Safeguard Tokens (SGT) will be sold and distributed through a pre- and crowdsale process, of which the details are laid out in this white paper. Safeguard's market rollout, software development and financial trajectories are also outlined in this white paper.

Table of Contents

1. Introduction

Every year, all over the world, there are more than 370 million non-fatal work related injuries and illnesses, whilst in the USA alone there are an estimated 10 fatal accidents per day.[1] Similarly, 1 in 15 employees in the Netherlands still suffer from workplace-injuries each year.[2] Not only do these injuries and accidents have a vast impact on livelihoods and wellbeing, they also weigh down heavily on economic productivity and output by an estimated 3.94% of GDP, costing the EU an estimated €476,000,000,000 each year.[3]

We aim to radically mitigate this by designing tomorrow's safety systems, today. Specifically, we're building a decentralised platform that will be able to predict accidents and injuries preemptively and in real time. By means of this system, we aim to reduce workplace accidents for our users by 20% before 2022.

How are we going to do this?

By means of the Safeguard Protocol: a first-of-its-kind open source protocol network for the world of safety. A decentralised, not-for-profit platform built entirely on the Blockchain, the Safeguard Protocol aims to facilitate the co-development of a universal safety application that both organizations and individuals can make use of and build upon.

In looking at data and AI in the context of safety, the potential exists of utilising information about a physical environment and predicting the potentially dangerous situations that can unfold within the environment. With adequate data input (through internet of things technology) and predictive modelling practices, potentially dangerous situations in any physical environment can be flagged, enabling future prevention of accidents, injuries, fatalities or general safety threats.

Building on three years worth of research, business and product development on Safeguard, and with large existing customer base consisting of organizations such KPN, BAM, and Ingram Micro, we're taking what we've built and making it open source. In such, we're providing organizations and businesses with previously licensed software that can make their working spaces considerably safer.

Why are we doing this?

Because we believe that in a rapidly-shifting world, the power over safety systems should be in everyone's hands, thereby enabling everybody to benefit from technology that is both accessible and affordable. In line with the principles of decentralisation, transparency and community, **we're globalising safety.**

By taking part in the Safeguard Token sale and joining our ecosystem, you'll be supporting the development of an unprecedented ecosystem, dedicated entirely to making the world a safer place.

This white paper sets out to demonstrate what Safeguard is and how we can facilitate safer working environments for everyone.

1 http://www.ilo.org/global/topics/safety-and-health-at-work/lang--en/index.htm; http://www.icohweb.org/site/images/news/pdf/Report%20Global%20Estimates%20of%20Occupational%20Accidents%20and%20Work-related%20Illnesses%202017%20rev1.pdf

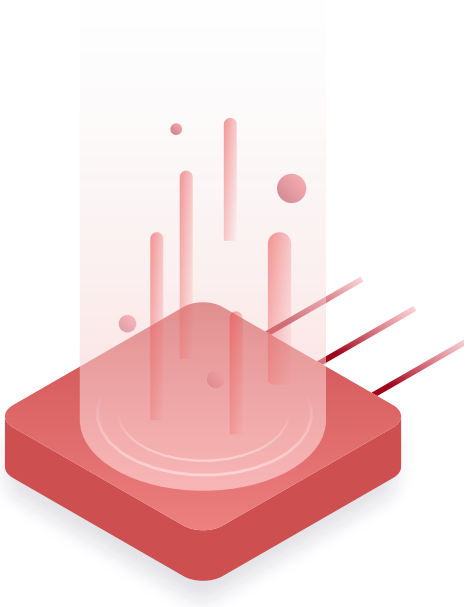
2 https://www.cbs.nl/en-gb/news/2014/30/one-in-15-employees-involved-in-work-related-accidents

3 https://osha.europa.eu/en/tools-and-publications/publications/international-comparison-cost-work-related-accidents-and/view

2. Challenges faced in the Safety Industry

Whether it be through equipment-malfunctioning, on-site fires or purely through a lapse in someone's concentration, we're all exposed to safety risks and hazards every day of our lives, often without even realising it.

Hence, with the goal of reducing these risks, we took a deep look into the role of technology in the context of organizational, work-related safety. We quickly learned that most organizations were still making use of simple but often inefficient and outdated technology, from pagers and handheld radios to white boards and manual attendance signs. In an era of automation, big data and optimal efficiency, we realised that organizational safety could be dramatically improved.



Furthermore, operational management applications often experience a high churn rate of users, and therefore a low customer retention rate. The Safeguard app overcomes this challenge in that it is able to run on a fully automated basis, ensuring that safety protocols are met whilst gathering vital data for the client without the app needing to be opened or enabled. With zero implementation costs and a user interface designed to match any level of technological capability, we've got distinct competitive edges that have put us ahead in relation to our competitors.

Having solved many of the above issues with the current Safeguard crisis-communication platform, we now aim to address the following.

2.1 Practicality and Ease of Use

The case often arises where a small business, organization or event manager required a temporary safety solution like Safeguard's crisis communication app for a specific use case. Once-off private security and safety services are expensive, and safety management applications often require long-term subscriptions. In attempting to avoid these, organizations and event managers end up with outdated, less practical safety mechanisms like pagers and radios.

The Safeguard Protocol provides a solution to this challenge, enabling organizations to connect to the Protocol and easily design whatever solution they need, without high costs or barriers to entry. For example, the Safeguard platform can be utilised for a period of three days for the purpose of an event, enabling better safety oversight for event managers, without the cost of a full-scope security and safety service hiring contract. The software is available to anyone, thereby eliminating the need for complex contracts.

2.2 Reactive versus Proactive Safety Management

As it stands, safety management solutions are reactive by design. Specifically, they are developed with a strong focus on responding to accidents and emergencies after they have occurred, thereby driving the practices of damage control and crisis mitigation. Although this is a crucial component of safety management, the focus therein does not lie with preventing accidents, but rather with responding to them.

The Safeguard Protocol and its AI-powered accident prediction platform is pre-emptive in terms of its design: attempting to prevent accidents before they occur. With the current data-centric nature of technical infrastructure, the opportunity has arisen for a fundamental shift to occur from reactive to proactive, preemptive safety systems. Safeguard will be at the forefront of this shift.

2.3 High Utility Costs

Setting up contracts for safety services can be complex, challenging and time-consuming; requiring negotiations on elements of price, degree of support, uptime as well as other factors. With the Safeguard Protocol, users can utilise the Safeguard solution themselves and only pay (in SGT) for the extent of the software that they use (measured in time and number of users). Implementation, set-up and support are optional add-ons that can be included in their use of the Safeguard Protocol.

2.4 Privacy versus Safety

In line with new regulations and privacy laws, such as Europe's GDPR framework, many businesses are left with the challenge of balancing a high standard of safety on the one hand, and privacy on the other. For example, if a worker's presence is registered by name, he or she has the right to be forgotten. Although this is a step forward in promoting the general right to privacy, it brings about its own organizational and management challenges. As will be illustrated in this white paper, our Protocol's encryption system will uphold the principle of data privacy whilst ensuring the quality of a cutting edge safety system.

2.5 Centralisation and Monopolies

As it stands, the international safety market is dominated by large, multinational corporations that sell safety and security services at a global scale. Due to their advantage of cost-scale efficiency and their historical influence within the industry, it is difficult for smaller market-players and startups to enter this sector. Often, becoming a partner or supplier to such established organizations is also extremely difficult, as the process of business 'lobbying' is often required. The Safeguard protocol provides an alternative to this. As will be shown in this white paper, our community-driven, inherently decentralised Safety-tech platform incorporates a new standard of accessibility into the world of safety.

3. The Safeguard Solution

Safeguard is an established company startup redefining occupational safety in Europe, having proved their concept with The Amphia Hospital[4] in the Netherlands as their first client in 2015. Through the real-time tracking of safety personnel and our emergency-response app, we have been chipping away at traditional, non-optimal response times for emergency situations. Hereby, we have been saving organizations vital hours, minutes and seconds when they're most needed.

Additionally, we've been working with some of Europe's largest multinationals to enable data-driven solutions for occupational safety management. From telecommunications leader KPN, to property and construction pioneers like the BAM Group and government bodies like RDW, our safety solution continues to be adopted by businesses. Recognised as a driver of innovation in the domain of safety, Safeguard has also received government-backing in the form of subsidies and endorsements. In terms of market potential, our capacity for scale is extensive.

Safeguard's team and operational home is based in the Netherlands. With 10 core team members and a team of trusted advisors, we're a group marked by the trait of diversity, both in skill sets and knowledge. We have proven experience in the fields of software engineering, business development, growth marketing and emerging technologies such as artificial intelligence and blockchain. Hence, our team is optimally suited to the ambitious endeavour of making the world an all-round safer place. Furthermore, we are supported by experienced advisors in the fields of marketing and PR, legal, finance, safety regulations, smart contract development and cyber security.

Every great company starts with a vision, and ours is to operationalise a data-driven approach to making workplaces safer for everyone. We strongly believe that through the combination of decentralisation and artificial intelligence, we can foresee and solve the safety challenges that people face everyday. We thrive on simplicity. Through our agile working system and fast-paced product development workflows, we're moving organizational safety in its entirety away from traditional and outdated safety practices to optimal, data-driven solutions that uphold the value of people's everyday wellbeing.

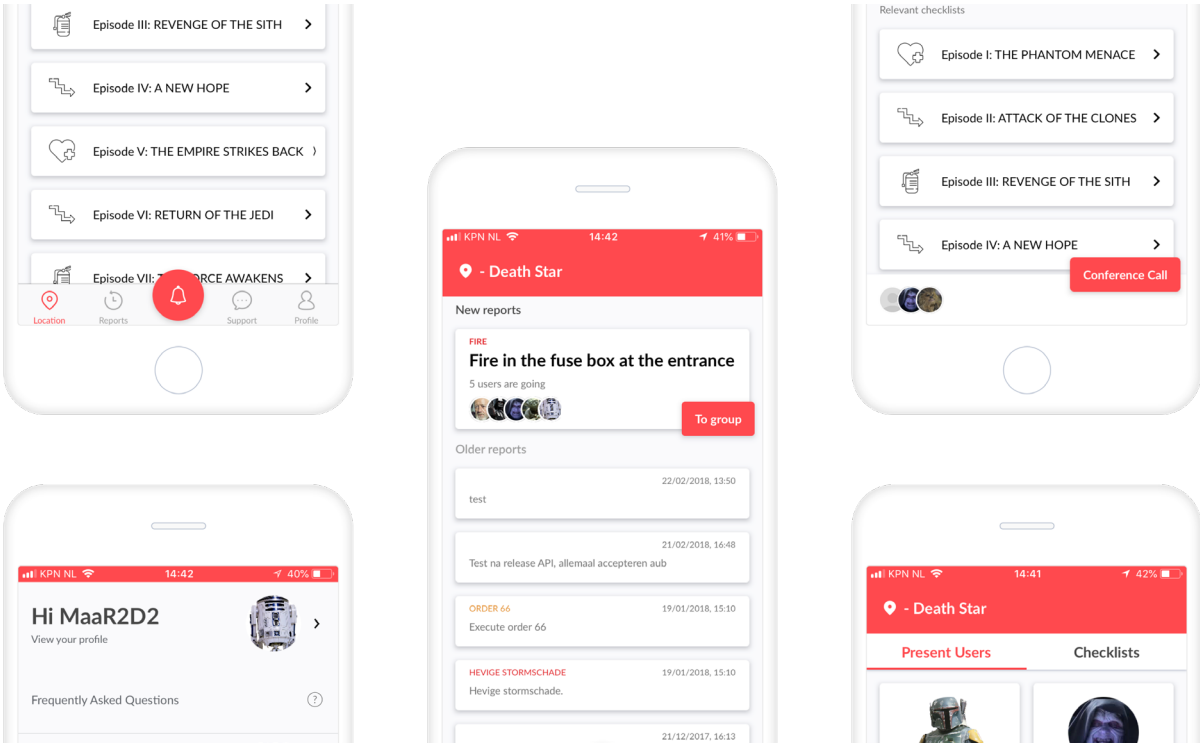
3.1 The current Safeguard App

As it stands, The Safeguard app offers a solution for safety management and crisis communication, and has therefore been adopted by various large organizations in Western Europe.

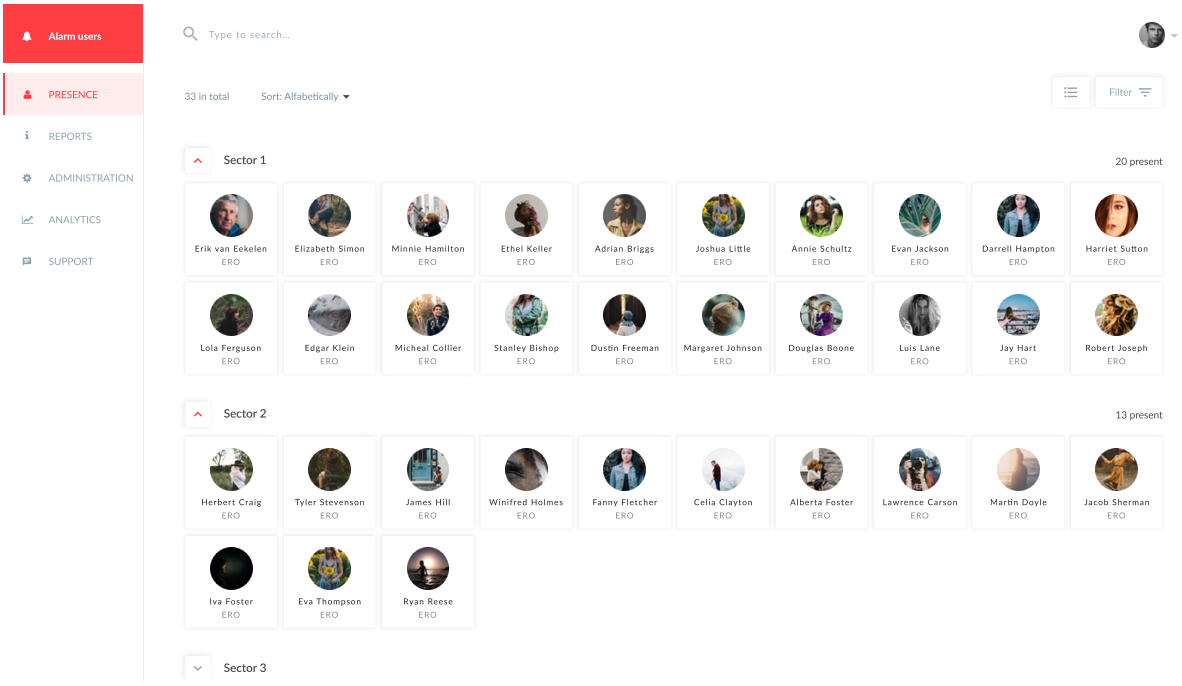
Specifically, we help organizations solve various challenges by means of:

- Automatic attendance registration based on Wi-Fi and geofencing.
- The possibility to create predefined groups and scenarios, ensuring that the right people are always alerted during an emergency situation.
- A reporting function; a data hub covering all the aspects of an organization's safety, like the exact attendance hours of safety officers. This facilitates the closing of organizational "gaps" and enables better personnel management, shift schedules and ultimately, cost-saving.
- The Safeguard Alert function; all employees are alerted at once by means of a push notification or an SMS.
- Emergency-assistance checklists; through which staff and safety personnel are empowered with precise information of what to do during an emergency or crisis.
- A conference call function; enabling groups of staff and stakeholders to communicate effectively and clearly when managing critical situations.

4 https://safeguard-app.com/healthcare/



— Figure 1: Visualisation of the Safeguard mobile application.



— Figure 2: Visualisation of the Safeguard dashboard.

4. Envisioning a Safer Future

The world is moving towards 'smart buildings', 'smart homes' and 'smart working environments'. Through machine learning and Internet of Things technology, different safety tools can intelligently communicate with one another. From smoke alarms to radios, switches, sensors and other devices, the possibilities are virtually endless.

Safeguard is applying this technology to build pattern recognition and machine learning software that deeply understands the root causes of safety breaches and emergency incidents, eventually predicting them in real time.

With the objective of building one foundational platform for the entire safety sector, we're co-developing our envisioned AI system with a range of partners and data-input providers (Oracles). Based on the large quantity of required data for this system to effectively fulfill its task, the community-driven approach to its development will also play a pivotal role in bolstering the speed and scale of the project. Within this development ecosystem, the Safeguard Token (SGT) will be used to incentivize others to contribute to the Safeguard Protocol, providing additional input variables to our AI platform, thereby continuously expanding and improving it.

Regulated by The Safeguard Foundation, the Safeguard Protocol offers a decentralised alternative to the current Safeguard (crisis communication) platform. Operating entirely on a Blockchain and employing mechanisms of data-encryption and smart contracts, this protocol enables users to anonymously use the Safeguard Protocol, whilst also enabling them to customise it to their own specific needs.

As a driving principle, we're aware of the potential to 'decentralise' and thereby democratize the world of safety-tech, putting the power in the hands of everyday consumers and businesses.

5. The Safeguard Protocol

With the scalability that Blockchain technology offers, in line with its potential for others to contribute to and co-create with, a foundational infrastructure will be built to act as a 'highway' upon which safety-tech becomes both universalised and accessible.

The Safeguard Protocol's decentralised nature implies that there is no single party who has control over the platform in its entirety. Rather, due to it being open source, anyone can contribute to the entire ecosystem; enabling to add value to the existing platform by developing their own Oracles. The community will then review the Oracle, and if it passes validation, the creators of the Oracle will be rewarded in SGT whenever the Oracle gets a request. Incentivization is therefore a fundamental part of the ecosystem's model, fostering a strong community of developers that will benefit when contributing to the Safeguard Protocol source code.

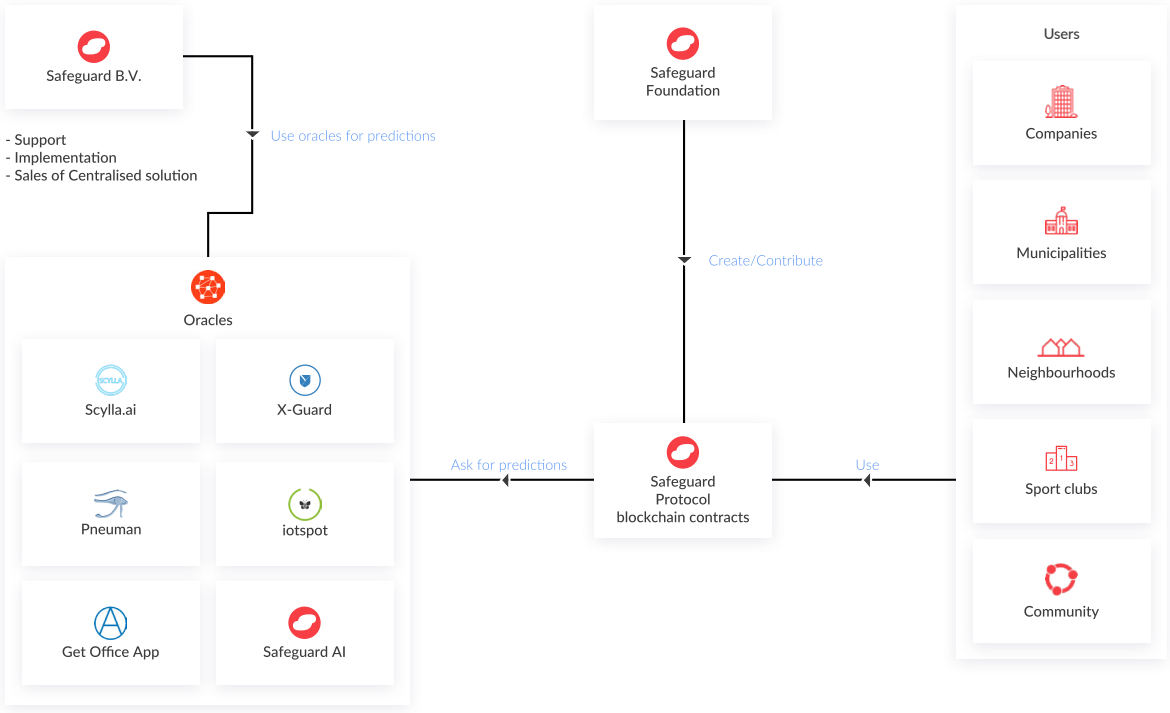
Another key advantage of the Safeguard Protocol is that any organization can utilise it without needing to formally purchase licensing from a centralised company. This process usually entails contractual agreements and other time-delaying factors. Rather, such users can access the Protocol and use it in whichever way needed. Crucially, this means that there are no fixed costs for payment structures in place when wanting to use the platform. Rather, a pay-per-usage model will be in place (for businesses and organizations), managed entirely on the Blockchain and conducted in the form of SGT.

6. The Safeguard Foundation

The Safeguard Foundation is a not-for-profit organization based in the Netherlands, acting as the main contributor to the Safeguard Protocol ecosystem. Based on the fundamental principle of making safety-tech accessible to as many as people around the world as possible, the Safeguard Foundation is entrusted with the mission and tasks of:

- Open-sourcing the current Safeguard Platform.
- Building the Safeguard protocol in line with a stakeholder and community-centric approach.
- Actively developing its own open source AI models, which will also be used as Oracles.
- Facilitating and advising on the co-development of the Safeguard Protocol, thereby;
- engaging with and growing the network of Safeguard's Oracles.
- Govern and grow the Safeguard Protocol ecosystem, acting as a regulatory figure in determining which AI-techniques developed by the community are worth adding to the pool of Oracle sources;
- Rewarding community developers with SGT for their contributions to the Protocol platform.

Through the Safeguard Foundation and its potential to roll the Safeguard Protocol out at a global scale, the potential exists to extend Safeguard's accident prevention solution beyond the domain of workplace safety. In that anyone can contribute to the Safeguard protocol, the potential exists for users to develop new use cases that are adapted to specific to living spaces, municipalities, recreational facilities and sports clubs, as well as entire neighborhoods and communities.



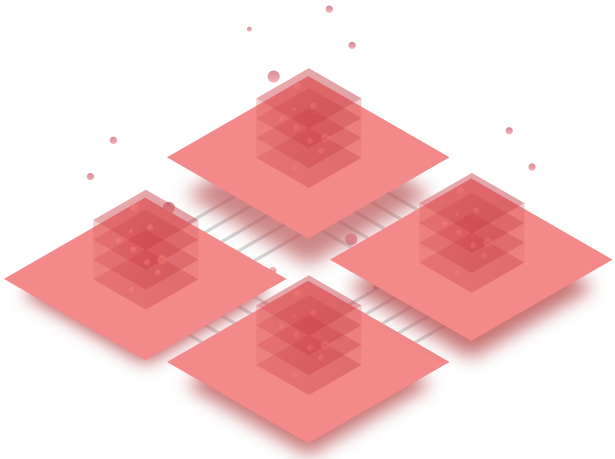
— Figure 3: Overview of the Safeguard Protocol ecosystem.

7. Oracles & Integrations

To achieve our envisioned outcomes, we're building an ecosystem of partnerships and integrations with different companies and technology service providers. These partnerships are essential, especially for the purposes of data and knowledge-generation.

The data-input services these companies provide will be called Oracles and will be directly linked to the Safeguard Protocol Blockchain platform. The Safeguard Foundation will also be developing its own open source AI models, which can be used as Oracles to build our blockchain solution.

Partnerships have been and will continue to be formed with a broad range of companies which are specialized in domains such as AI, Big Data and Internet of Things technology. To date, partnerships have already been formed with industry leading data-sharing protocols, as well as with organizations such as Scylla[5], IoTspot[6], Pneuman[7] and Knowingo+[8].



7.1 Envisioning the Safeguard AI Oracles

In a rapidly changing world, tangible products and software systems are capable of integrating with one another. This means that through the linking of safety hardware with intelligent software, it becomes possible to continuously monitor the safety levels and statistics within a given environment. More importantly, such a combination would enable the prediction of future safety levels and scenarios, and the effective management of such levels.

By means of Safeguard Oracles, different data sets and predictive modeling algorithms can be incorporated into the Safeguard Protocol, enabling a broad range of Artificial Intelligence solutions that users can request answers from.

5 https://scylla.ai
6 https://iotspot.co/
7 https://pneuman.nl/en/
8 https://knowingo.com/

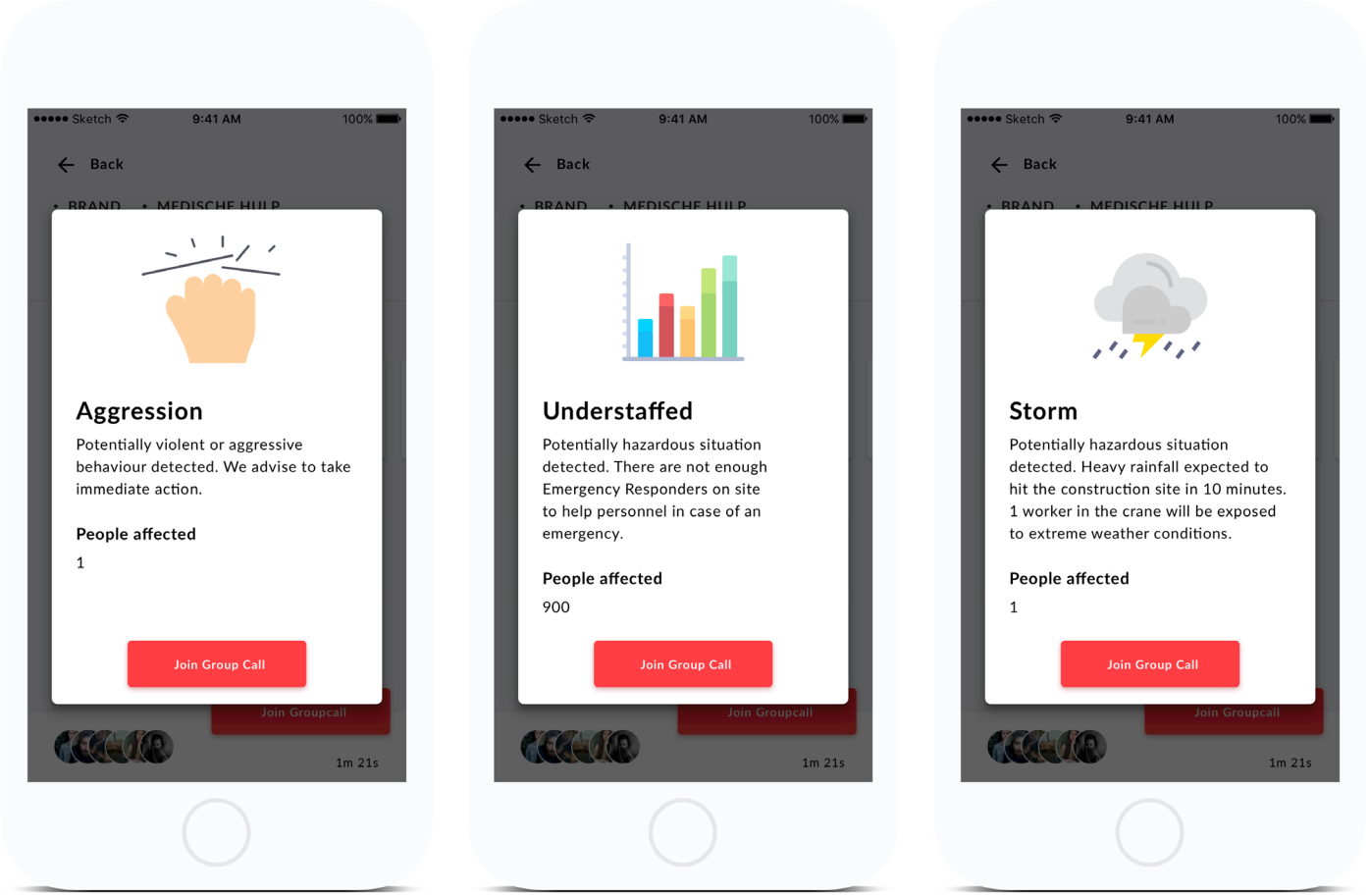
An example of a predictive modelling use case would be:

At a construction site, a AI prediction model would be able to source data from different pieces of industrial equipment (such as motion sensors on a crane) and cross-reference such data with live data relating to the weather, GPS location and time of day. This would occur by means of API integrations and partnerships. Assuming extreme weather conditions and through the intelligent analysis of such data, our system would (in real time) be able to flag the working conditions as critically dangerous and potentially disastrous. Thus, managers and stakeholders are empowered to evaluate the situation at hand and make an executive, data-driven decision on the feasibility of continued work.

Other examples of where a dangerous situation can be predicted preemptively or in real time are in the cases of:

- Chemical spills or accidents
- Broken or jammed elevators
- Fires
- Water overflows or leakages
- Security breaches
- Power failures
- A shortage in staff
- Poor air quality

It is important to note that each scenario will be predicted by means of a different, unique AI model, but in line with the same development structure as described above.



8. What about the original Safeguard Platform?

Separate from its primary use case, as outlined above, Safeguard Protocol's open source software can be sold in its original 'licensed' (centralised) format. Based on the principle that developers in our community can contribute to and build on the Safeguard Protocol, they will also be able to sell their variation of the Safeguard platform in a licensed, package format to other parties. This is in line with the acknowledgment that many organizations are not yet ready to embrace the principle of decentralisation, whilst still wanting to benefit from the Safeguard Protocol and ecosystem.

This will be a commission-based license, where companies selling Safeguard will have to pay a fee (in fiat currency) to the Safeguard Foundation, which in turn will be used to improve and maintain the ecosystem. These 'centralised' clients will also be able to make use of the ecosystem's Oracles for a fee.

Because the Safeguard Foundation is not-for-profit, any excess profits will be reserved for the cause of universalising Safety-tech and best practices; whether it be in the form of disaster aid donations or first aid training campaigns.

9. The Role of Artificial Intelligence

Advances in both network infrastructure and sensor hardware allow for generation of massive data streams, a process that was previously impossible. As it stands, many organizations are looking to optimize business processes through data, whilst also seeking mechanisms for monetizing their data streams. For example, the user experience flow and 'clickstream' of a business's website provides thousands of per-user generated events that depict customer journeys and user behaviours in extensive detail. This data stream can then be used to optimize the customer journey.

So far, many companies have succeeded in using data to their benefit. Although important first steps have been made in the movement toward data-driven decision making, various advances can still be made. It is at this point where the role of Artificial Intelligence becomes relevant, in that AI enables masses of data to be interpreted and utilised in a short and efficient manner, thereby eliminating the need for manual interventions and inefficiencies. The advantages of an AI system are generally as follows:

- **More precise interpretations and decisions,** a computer system has the ability to analyse more data in a short time frame, leading to a more informed and therefore more precise decision.
- **More objective and consistent interpretations and decisions,** a computer system is able to optimize business objectives without distractions or getting tired.
- **Allows for real time data driven decisions,** where manual interpretations take reasonable time, a computer system can often derive the same conclusions in sub second.
- **Cheaper than manual labor,** as salary cost is for most companies the highest cost driver, automatization is always preferred.

The road to the benefits above can be very tedious. The following steps should be considered.

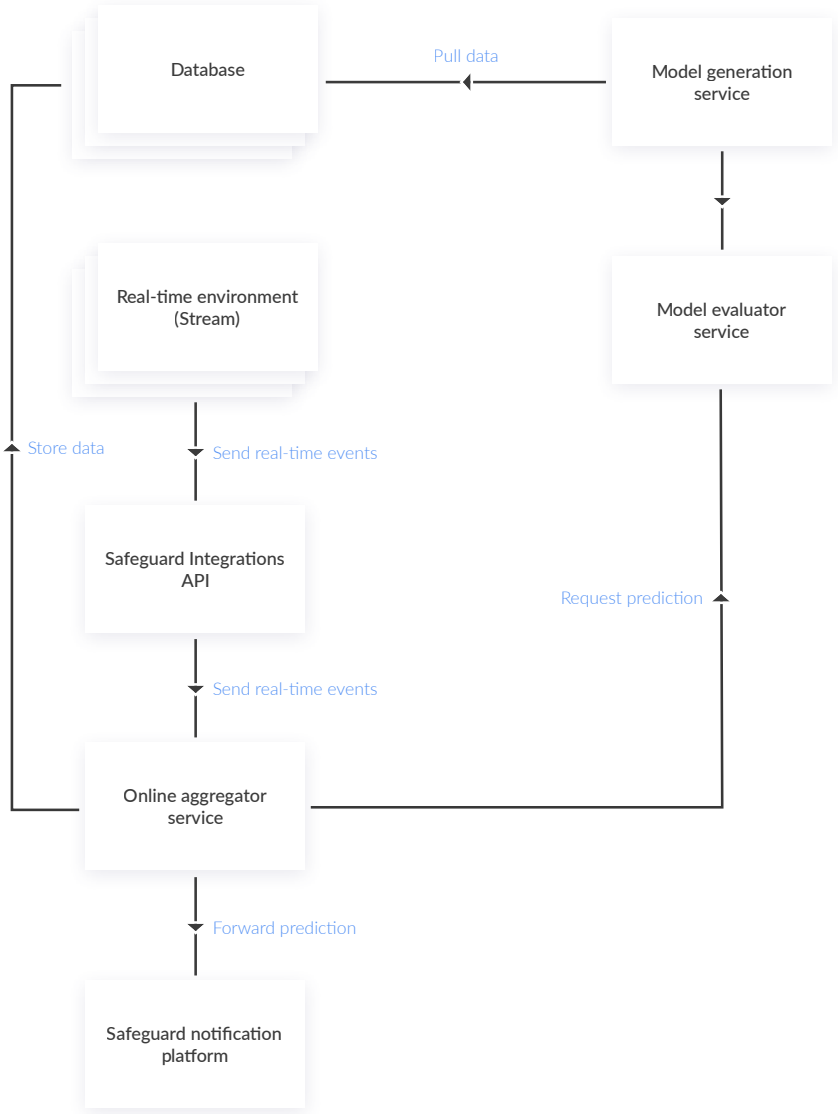
- **Data retrieval and storage,** setting up an infrastructure can be costly and need specific knowledge and skills from employees.
- **Data cleaning,** sensor equipment is never unfailing and therefore any noise should be removed for better evaluation of the data. Moreover the manual decision making can introduce biases that stand in the way of getting to an optimal solution.
- **Feature engineering,** in order to compare situations with one and other we need to tell a system what the basic building blocks of the situations are. Simply speaking we need to aggregate the data per situation for evaluation.
- **Modelling,** the core of every AI is a model generated by data itself. It creates a mapping between features input and desired solution. Many techniques are available for this but selecting the right one for a specific case is certainly not trivial.
- **Utilisation of model output,** a service layer is needed in order integrate the decisions of the AI into the business process.
- **Evaluation,** as the world is changing constantly so will the system. Some metrics need to be defined and monitored in order to know which data sources/techniques can improve it.

Often, businesses are aware of the data that they generate each day, but are unaware of the steps that can be taken to truly utilise such data to their advantage. Through Safeguard's AI system, businesses will easily and efficiently be able to reap the benefits of their data.

9.1 The Safeguard Protocol AI System

A technical breakdown: AI-powered accident prediction

The diagram below shows a high-level overview of how our AI system will be incorporated into our complete ecosystem.



— Figure 4: High-level overview of the AI system

Data will be stored in S3, Amazon Web Service's storage system, as it offers the best trade-off between speed and cost. It will contain cleaned, categorised and pseudonymised data.

The Model Generation Service (MGS) will pull data from the Database, and push its model to the Model Evaluator Service, as explained in detail below.

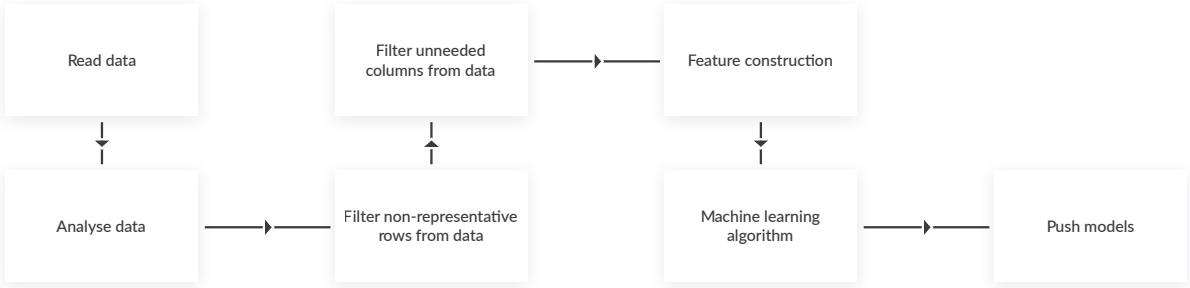
The 'Real-time environment' is the collective name for all the different integrations we have established with our partners. They push events to the Safeguard Integrations API, which will use Kafka[9] for it's real-time data pipeline. It will act as an adapter for every different integration, thereby making integrations with our API as convenient as possible.

9 https://kafka.apache.org/

An Online Aggregator Service (OAS) then receives these events, and requests a prediction from the MES. Furthermore the OAS will periodically push data to the Database, to be used for modeling by the MGS. When the OAS receives a prediction from the MES, it will forward it to our current Safeguard Notification Platform to notify employees about possible dangers in their working environment.

The Model Evaluator Service (MES) evaluates the incoming datastream against the model received from the MGS. The outcome thereof will be a specific prediction, which will be returned to the Online Aggregator Service.

Our entire stack will be based on AWS.[9] We will use Spark[10] for data processing and Docker[11] to implement our micro-service architecture.



— Figure 5: The Model Generation Service (MGS) in detail

The MGS will start by reading the data from the Database. It will then analyse this data, filtering out any non-representative and unneeded information in the process. This analysis is needed to remove outliers so we can construct a more precise model.

After the filtering process, as outlined above, comes the 'Feature Construction' stage. This process builds intermediate features from the original descriptors in a dataset that can be used by a Machine Learning algorithm to generate a model. We will use encoders like 'One hot encoder'[12] to turn all categorials into real vectors.

The Machine Learning algorithm can be different for every use-case we're going to predict, based on the requirements of that use-case. For example, predicting fires requires a different model than predicting equipment-induced injuries. We will utilise prediction techniques like decision trees, logistic regressions and deep learning.

Eventually, the models will be pushed to the Model Evaluation Service, where they will be saved for future use in order to calculate predictions.

10 https://aws.amazon.com/

11 https://spark.apache.org/

12 https://www.docker.com/

13 http://scikit-learn.org/stable/modules/generated/sklearn.preprocessing.OneHotEncoder.html

10. The Token Model

The Safeguard Token (SGT) is a NEP-5-based[13] token with various functionalities, and is a key component of the Safeguard ecosystem. NEO enables the automation of digital asset management by means of smart contracts. More importantly and within a larger context, NEO serves the purpose of facilitating a societal-wide shift toward a "smart economy", built entirely on a distributed network, thereby allowing SGT to develop and grow in a scalable, secure and efficient way.

Our token model is built in such a way that it facilitates the establishment of a micro-economy. This means that as the number of users within our ecosystem grows, our prediction capability grows too. The overall usability of the Safeguard app and platform will thereby strengthen continuously. Crucially, as the system grows in functionality due to its increasingly-optimised prediction capability, members are further incentivized to contribute to the Protocol and make use of SGT.

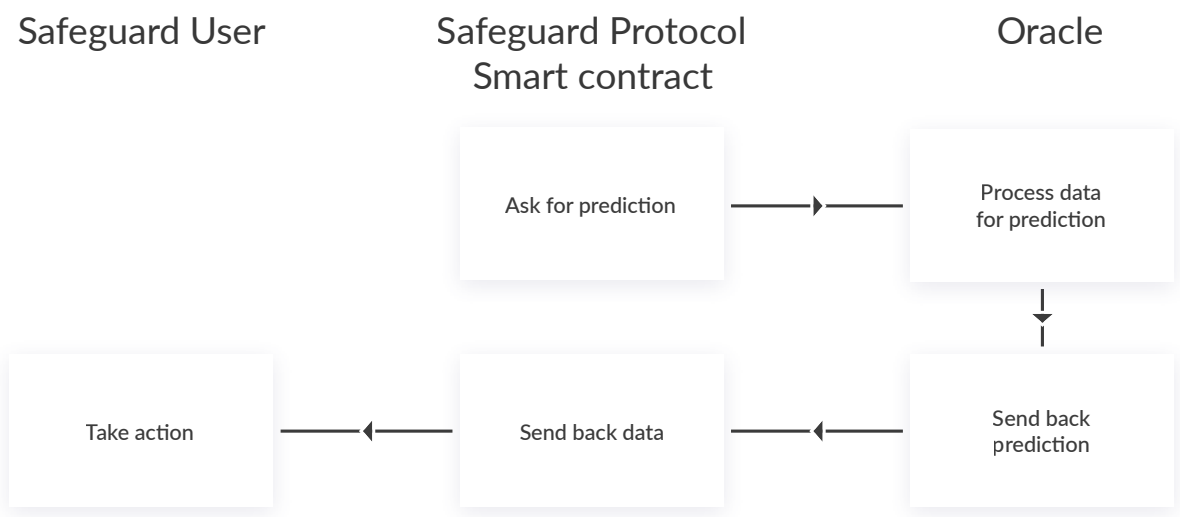
Note: The Safeguard Tokens are utility tokens that members can use within the ecosystem, thereby enabling them to derive value from services provided by the Safeguard platform. The tokens are not intended for speculation and do not represent company shares or any claim in the company's decision-making process. Safeguard Tokens are not securities and are thus not associated with future revenue streams or values other than those derived from platform usage.

14 http://scikit-learn.org/stable/modules/generated/sklearn.preprocessing.OneHotEncoder.html

10.1 The SGT Use Case

SGT Use Case 1: Access to Accident Prediction and Prevention Oracles

In order for companies to make use of the Protocol's Oracles and accident-prediction AI models, a fee (in SGT) will be requested as compensation for the Oracle's developer (an organization or community-member).



— Figure 6: Flowchart outlining the process of asking predictions from Oracles

SGT Use Case 2: Transactions on the Network

Every transaction on the Safeguard Protocol network will require the usage of SGT. Some examples of such transactions include:

- Creating a checklist
- Adding a user
- Sending an alarm
- Registering presence

11. Execution of the Token Sale

Safeguard will establish a pre- and crowdsale round of Token Sales in order to provide and reward early users of the Safeguard platform with SGT, which they can utilise within the Safeguard Protocol ecosystem. In this section, an extensive breakdown of the token sale is provided, elucidating the time frame in which certain milestones will unfold, and how Safeguard intends to use the funds raised during the token sale.

11.1 Token Fundraising

We are raising a total amount of €10,000,000 in NEO through our Token Sale. This amount includes both the presale and crowd sale rounds. Participants in the presale round are selected partners, private investors and venture capitalists that play an important role in the general development of our product and services. Such presale participants are obliged to buy in with a minimum amount of NEO that will be communicated prior to the presale round. Additionally, participants in the presale round will receive a 5% bonus.

The public Token crowdsale will be accessible and simple to buy into, enforcing the lowest-possible minimum buy in. The actual rates, expressed in NEO, will be communicated on the Safeguard Token website and Telegram Community.

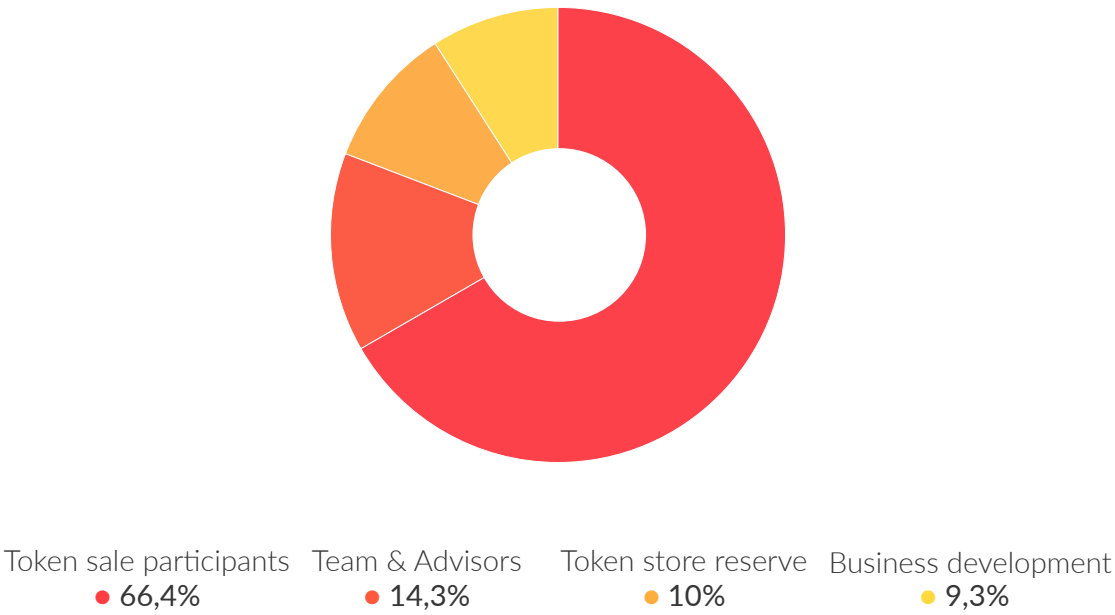
Despite our commitment to raising the intended €10,000,000 in NEO, a soft-cap of €2,500,000 in NEO will be imposed.

The Token Sales will only accept NEO, and all unsold tokens left over from the token sale process will not be minted.

11.2 Token Distribution

A maximum amount of 113,400,000 SGT will be minted. Because a token-cap will be implemented from the onset, this amount can and will never be increased. The token distribution will be as follows:

- No more than 75,297,600 SGT will be minted for the Token Sale in our presale and crowdsale rounds combined. Therefore, 66,4% of the total SGT supply is allocated to participants in the Token Sale rounds.
- 14.3% of the total SGT supply will be reserved for the core team and future team members, as well as advisors. This will be vested over a period of 4 years using a smart contract, using a linear schedule with yearly bonuses.
- 10% of the total SGT supply will be reserved for the marketplace itself, for purposes such as driving incentive schemes for clients and data-sellers.
- 9.3% of the total SGT supply will be reserved for business development, strategic partnerships, third party services, and bonus allocations.



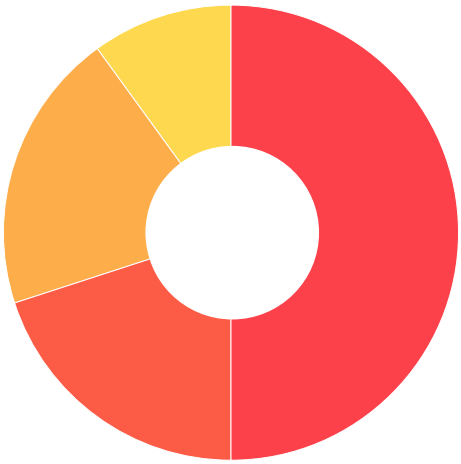
— Figure 7: Token distribution model.

12. Use of Funds

In the token presale, an investment of €750,000 will be raised in order to cover the operational costs of promoting, developing and running the Safeguard crowdsale. For whitelisted presale investors, a minimum investment amount or "buy-in" fee of €1,000 in NEO will be in place. The kick-off date for the whitelisting for the presale is scheduled for the 3rd of April 2018, and it will run for a four week period or until the cap is reached.

Additionally, a portion of funds will be allocated to the setting up and launching of the second stage of the token sale, namely the public crowdsale. This crowdsale will be accessible to everyone and will commence in July 2018. Together, the presale and crowdsale will entail the selling of 66.4% of all the Safeguard tokens. Following the presale of Safeguard Tokens, specific information concerning the crowd sale, such as where and how it can be bought, will be made publicly available.

The crowdsale funding will enable a runway for the growth of Safeguard over a long term period of 3 to 5 years. Starting with the growth of our development team and the improvement of Safeguard's backend architecture, we'll also use the money for developing the Safeguard ecosystem and forming new partnerships with relevant organizations and companies. Besides our need to cover business and development costs, reserve funds will also be required to account for operational risk intermediation.



— Figure 8: Use of funds.

13. Roadmap & development

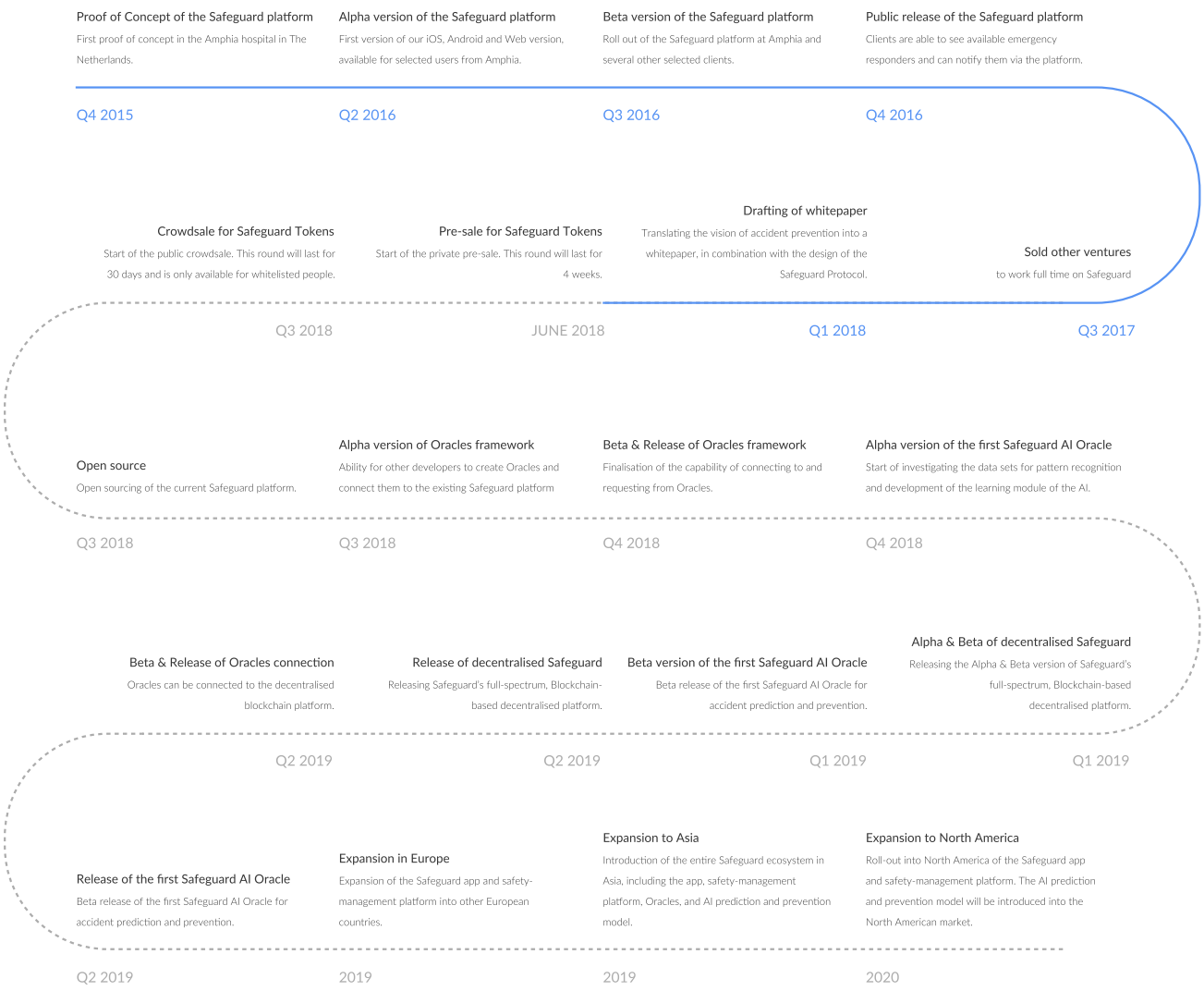
An important consideration to take note of is that unlike many other token sale projects, Safeguard has an existing working product, revenue stream and sales cycle. Furthermore, our outbound selling potential and strategy is spread out between a vast number of industry verticals, including government, healthcare, education and the industrial sector. According to the European Occupational Health and Safety body (OSHA), approximately 10% of all employees in the EU and US are emergency responders, thereby illustrating the vast nature of our target market and potential for growth.

With this in mind, our first roadmap objective is to ensure a smooth conversion from our current 'centralised' safety management platform into a 'decentralised', open source system. We will work closely with our existing clients in this respect, ensuring a transition that is beneficial for both current and future Safeguard users.

Between creating new relationships with potential Safeguard partners and building our Safeguard client user-base, our European business development team will ensure further expansion within the European market in the last quarter of 2018 and going into 2019. Simultaneously, 2019 will see Safeguard executing a market penetration and roll-out in the Asian market, where we have identified a distinct lack of tech-driven safety solutions. The following year (2020) will consist of Safeguard's expansion into the North American market.

Most importantly, as these milestones and achievements unfold, our development team will work on further building our decentralised safety solution, permitting us to fluidly connect with different forms of AI and IoT solutions, whilst simultaneously improving the scalability of our platform. Furthermore, this team will be responsible for establishing and experimenting with our accident-prediction model.

In terms of our hiring objectives, the development team will be grown significantly in both the short- and long-term; with a specific emphasis on blockchain developers and Data scientists. In this respect, we have confirmed a partnership with Develandoo, a tech-talent placement firm, in order to ensure the fast and efficient upscaling of our development team.



— Figure 9: Our roadmap

14. Team

Safeguard was founded by Ingmar Vroege and Gertjan Leemans, a powerful duo whose entrepreneurial endeavours trace back to their high-school days together. As business partners, they have worked on various successful ventures together. In 2016, they launched Pokeradar, an app that received 1 million downloads in three weeks. Apart from consulting for large clients like KLM and Achmea, Ingmar and Gertjan also worked alongside YPI, award winning H2 architects and shipyard leaders Feadship, to enable Virtual Reality (VR) visualization for the superyacht industry. For this, they received CNBC media coverage.[14] Successful exits were made from both of these ventures in August 2017 to enable a full time focus on growing the Safeguard app and ecosystem. They both come from engineering backgrounds, and Ingmar has over the years developed himself into an experienced and competent CEO, whereas Gertjan perfectly fits into his role as CTO and chief strategist behind Safeguard's product and R&D teams. Together, they have extensive knowledge in mobile, web and blockchain development.

Apart from its founders, the Safeguard team consists of a diverse mixture of talented individuals. From experienced web, app and blockchain developers to UI and UX super-geeks; from growth marketers and sales experts to finance gurus and PR specialists, it's safe to say that the Safeguard team is well-equipped and well-experienced enough to take on the task at hand. Ultimately, the Safeguard team is one which has worked together on various successful projects within various companies. Together, they have grown from strength to strength over a period of several years, providing them with a distinct, collective skill set of building and selling complex and scalable products in short time periods.

Ingmar Vroege
CEO

Gertjan Leemans
CTO

15 https://www.cnbc.com/video/2016/10/03/vr-for-your-super-yacht-.html

Maarten Zonneveld

iOS & Blockchain Developer

Max Wijburg

Business Development

Erik van Eekelen

UI/UX Designer

Gino Taselaar

Growth Marketeer

Pascal van Steen

Growth Marketeer

Wouter Janssen

Android Developer

Walter van der Stelt

Product Management & Support

Erich Rickens

Growth & Content

Jeroen Jansze

Data scientist

Sophie Veldhof

Legal

Jannick van Ballegooijen

Frontend Developer

Zehna van den Berg

iOS & Blockchain Developer

Bob de Graaf

Data Scientist

Ramon Steur

Finance manager

15. Advisors

Manuela Krull-Mancinelli

Blockchain Entrepeneur

Managing Director of Startupbootcamp

Arjan Pelders

Business Executive & Trusted Advisor

Former Managing Director of PON Power

Albert Stepanyan

AI Advisor

CEO at Develandoo

Robert Schoormans

Chief safety & Fire Advisor

Eric Carbijn

Owner at Oblivion

Dutch leader in AWS Consultancy

Paul Stomph

Smart Solutions Developer

Royal Haskoning DHV

Ivo Jonkers

Public speaker about Blockchain

Tech manager at TQ

16. Community & involvement

Please join us on Telegram to provide feedback on the white paper.
To be part of our active community or learn more about what we do:

Visit our website at	http://www.safeguardtoken.com
Join our Telegram community at	https://t.me/safeguardtoken
Follow us on Twitter at	https://twitter.com/SafeguardToken
Follow us on Facebook at	https://www.facebook.com/SafeguardToken
Follow us at Medium at	https://medium.com/safeguardtoken
Or email at	support@safeguardtoken.com

17. Disclaimer

The Safeguard Token Sale is only meant for sophisticated users who are knowledgeable of the features and risks of relevant blockchain technology and smart contracts.

What is the Safeguard Platform and Token sale?

The Safeguard protocol is open source code, build on the blockchain, that can be used to deploy the safeguard system.

- Safeguard tokens can be used to request answers from oracles.
- Safeguard tokens can be used for transactions within the Safeguard protocol.

The Safeguard digital tokens, called: Safeguard Tokens (hereinafter 'SGT' or Safeguard Token) can be used on the Safeguard Platform, but are not limited to: receiving and offering various safety-relevant datasets and receiving discounts on monthly Safeguard-app fees. The Safeguard Token is an utility token which can only be used on the Safeguard platform and is not intended to be used as an investment. By acquiring the SGT you expressly acknowledge and assume the risks described in this Safeguard Token Exchange Disclaimer.

If you have any questions regarding this information or regarding this Safeguard Token Exchange Disclaimer, please contact us at support@safeguardtoken.com. Safeguard may, in its sole discretion, amend the Safeguard Token Exchange Disclaimer at any time by posting a revised version on the site at https://safeguardtoken.com

Warnings

It is significantly more likely that you will lose all of the value that you or third parties attribute to the cryptocurrencies provided to Safeguard in exchange for Safeguard Tokens than any value you may gain. Safeguard believes that, amongst other based on the famous Howey test and the definition of securities in the (recast) Markets in Financial Instruments Directive, the Safeguard Tokens should not be deemed as securities or a collective investment scheme:

- the Safeguard Tokens do not grant you any voting or ownership rights;
- the Safeguard Tokens do not grant you any return on investment;
- the Safeguard Tokens do not grant you any profit and passive income from the ownership of the Safeguard Tokens;
- the Safeguard Tokens otherwise are not a participation in or connected to equity of Safeguard or a collective pool of assets;
- the Safeguard Tokens entirely derives its value from the services provided on the Safeguard platform.

Therefore, the Safeguard Tokens are not registered with any government entity as a security and Safeguard does not hold a license from a regulatory authority.

Risks

You are aware of the merits, risks and any restrictions associated with digital tokens, cryptocurrencies and blockchain-technologies, including but not limited to:

- risk of losing access to tokens due to loss of private key(s);
- risks associated with the NEO platform protocol;
- risk of hacking and security weaknesses;
- risk of uninsured losses;
- risks associated with uncertain regulations and enforcement actions;
- the risk that Safeguard may not be able to launch its operations and develop its blockchain and provide the services as projected in the Whitepaper. Therefore, and prior to acquiring Safeguard tokens, any user should carefully consider the risks, costs and benefits of acquiring Safeguard tokens in the context of the crowdsale and, if necessary, obtain any independent advice in this regard.

Representations and Warranties

By acquiring Safeguard Tokens, you represent and warrant that:

- you have read and understand the Safeguard Token Exchange Disclaimer in full;
- you fully understand, realize and agree that filling in correct information during the whitelisting process is your own responsibility. Safeguard is not in any way liable to repair the mistakes made by you during this process.
- you fully understand, realize and agree with the information about the functionality, usage, storage, transmission mechanisms and other material characteristics of the Safeguard Tokens, blockchain technology, blockchain-based software systems and their risks, and appreciate the risks and implications of acquiring the Safeguard Tokens;
- you fully understand, realize and agree that the Safeguard Tokens are created on a blockchain and are designed to be used to make various internal payments through the Safeguard Platform and it does not grant you any voting or ownership rights, any return on investment or any profit and passive income from the ownership of the Safeguard Tokens;
- you will not forge, or otherwise manipulate any personal or non-personal data requested by Safeguard in the process of your registration (will not use VPN or other means of distorting the data), or after its completion, will provide all necessary personal or non-personal data in the form and format requested by Safeguard in the event when such necessity arises in connection with the requirements of anti-money laundering and "Know Your Customer" (KYC) frameworks of Safeguard or in accordance with the applicable law;
- you do not intend to hinder, delay or defraud Safeguard or any other users of the Safeguard Platform or engage in any illegal conduct and or unlawful activity in relation to money laundering, receiving the proceeds of drug trafficking or terrorist activities; receiving the proceeds of criminal activities, terrorist activities or trading with such countries as might from time to time be subject to any embargo imposed by the Security Council of the United Nations, the European Union, or Singapore or in any place of the world.
- You are not eligible to participate in the Safeguard token sale:
  (a) you are located in the People's Republic of China or if you are a citizen or resident (tax or otherwise) of, or domiciled in, the People's Republic of China;
  (b) you are located in the Democratic People's Republic of Korea or if you are a citizen or resident (tax or otherwise) of, or domiciled in, the Democratic People's Republic of Korea;
  (c) you are located in the United States of America or if you are a citizen, resident (tax or otherwise) or green card holder of, or domiciled in, the United States of America;
  (d) you are located in Canada or if you are a citizen or resident (tax or otherwise), or domiciled in, Canada, **unless you are Canadian Qualified Person 1;**

  1 A "Canadian Qualified Person" means an individual or legal entity or person who is an "accredited investor" as defined in National Instrument 45-106 - Prospectus Exemptions, as may be modified, amended or supplemented from time to time and/or Section 73.3 of the Securities Act (Ontario), as may be modified, amended or supplemented from time to time.


Safeguard